De Theatro Motivarum, Motivation: In Search of Essentials. Research on a Theoretical Model of the Process of Motivation and on Critical Determinants of Interference

Mennes, M.A.

De Theatro Motivarum

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PROEFSCHRIFT

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
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volgens besluit van het College voor Promoties
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Menno Alfred Mennes

geboren te Singapore,
in 1955

Promotoren:	Prof. dr. J.M.J. Blommaert (Universiteit Leiden, Tilburg University) Prof. dr. J.W. Foppen (Maastricht University)
Promotiecommissie:	Prof.dr. J.A.A. Adriaanse Prof.dr. M.Ph. Born (Erasmus Universiteit Rotterdam) Prof.dr. R.J. Blomme (Nijenrode Business Universiteit) Dr. J.I. van der Rest

In this Dissertation, reference is made to separate Appendices.

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Acknowledgments

Long years ago, as a young child, I made a pledge, expressed in the next pages as a Prologue to this dissertation, a pledge that has been, as its principal 'raison d'être', at the origin of my writings. For many years I carefully kept this childhood dream, both as a treasured secret and as an uneasy promise. And now the time has come to present my findings after many years of research.

Although at first, the research and its funding appeared to be a solitary enterprise, over the years I came to realize I was not the entrepreneur or adventurer needed to accomplish such a mission. The adventure has been a rather fearful experience, and I am deeply indebted to a number of people who stood by my side during these years and without whom the project would have failed.

With greatest affection, I call upon their names...

To my beloved Désirée, zij is mij het licht in mijn ogen, her mere presence gave me courage...

To my parents, who taught me, directly or indirectly through who they were, all there is to know on the essentials of life...

To my children, Sebastian, Constantijn, Boudewijn and Christian, who in many ways paid a heavy price for my inspired ambitions. Voor hun begrip en hun uitzonderlijke mildheid in hun oordeel ben ik hen heel erg dankbaar. As I experienced in recent times, the fulfillment one is given through parenthood transcends everything else...

To my dear friends Tom and Andries, who raised me back on my feet when all lights appeared to go out...

To Oom, who instigated the very thought of starting this journey, many years ago...

In gedachten groet ik jullie allen...

Within a different context, I am indebted to many for their support, both in enabling those long years financially, professionally, or through disclosing their thoughts and feelings as one of the more than 3500 who participated in the various Studies.

Only a few names can be mentioned here...

Among the more than twenty Companies participating, I am especially indebted to Motorola, Philips MOS4YOU, now NXP, and TNT Express, and to the many managers and employees that helped and enabled beyond a sense of duty.

I feel privileged to have been able to write this dissertation within an academic setting at Leiden University, The Netherlands, first at the Center of Business Studies within its Faculty of Law, and later at the Honours Academy. Support, both from the Board of the Honours Academy and staff-members from the LLP Master Program has been considerable, and is very much appreciated.

I am profoundly indebted to both my promotores, Jos Blommaert and Wil Foppen, who followed my 'private project', as it was affectionately called, through many years. In providing guidance to a man in writing his life's work, they expressed extreme patience, gentle steering and respectful mentoring. I am deeply grateful: ik had geen betere promotoren kunnen wensen...

Leiden, June 2016

The atrocities of war, discrimination, genocide and poverty are curses that seem inherent to the human condition.

Much has been publicized on human suffering, mostly in press publications, personal accounts and geo-political studies. In contrast, insights into why these atrocities re-occur seem virtually absent, despite public outrage expressed throughout human history.

At the root of human suffering is a lack of knowledge and understanding of the tragic discrepancy between word, creed and deed. Unveiling the mechanisms that enable atrocities of war, discrimination, genocide and poverty to persist, are the 'raison d'être' of my dissertation. This photograph, reproduced in deep appreciation to its author, Silver Camera 1998 and 2005 laureate Geert van Kesteren, captures the emotional indignation that has led to this study, which, after 28 years of research, contains the essential findings of my life's work.

Remember,
A tree that fills a man's embrace grows from a seedling,
A tower nine stories high starts with one brick,
A journey of a thousand miles
begins with a single step...

Lao Tzu, Tao Te Ching, verse 64
(Star, 2003)

Prologue

In activities man sets about, a purpose, an intention, or an act of will can be seen. And all these intentional acts appear to have a common origin in the will of man to intervene in his destiny and his surroundings both mentally and physically.

Over the last hundred years an astonishing library of ideas, thoughts, debates, insights and 'best-practices' has been produced on the subject, gradually accompanied by empirical research, detailing almost every aspect of 'human motivation', as it has been conceptualized in literature.

Surprisingly, this vast body of knowledge on human motivation has brought us very few elementary insights to have the human condition thrive and prosper in a better world, and prevent us from conflict, discrimination, genocide, poverty and injustice that are all a direct result of 'man's will to intervene in his destiny'.

In August 2005, a photographer took a picture of a child, barely alive, and floating defenselessly, suspended on a scale as it was weighed in a refugee camp of MSF, Medecins Sans Frontieres in Zinder, Niger. The world watched and did virtually nothing. Where words are lacking, it illustrates my point. Humanity seems to let it happen, and, seventy years after the darkest pages in human history account of unthinkable discrimination and genocide we are still witnessing human suffering that remains largely ignored, or poverty and injustice with excessive differences in wealth, or financial institutions deeply affecting prosperity on an unprecedented scale.

After the atrocities in the Second World War, hardly any lasting collaborative effort has been initiated to provide comprehensive scientific insights preventing humanity from these excesses to ever happen again. Following recurrent famine and human suffering in the early sixties, leading to sustained extreme poverty in concentrated area's, numerous documents, essays, analyses were written, but no substantial insights were generated to prevent almost identical events to re-occur in the nineteen eighties and nineties. And more recently, institutions entrusted with preserving and safeguarding wealth, were found engaged in activities demonstrating an exceptional departure from their moral

responsibilities. To this day, no substantial and structural changes have been made to prevent a recurring disintegration that led to a prolonged economic recession affecting millions of people, especially younger generations at the start of their career.

From a perspective that these expressions are routed in what has been conceptualized as 'human motivation', precious little has been obtained considering the impact it could have had on tolerance, growth, geo-political stability or a simple basic mutual understanding. In a world gradually expanding, humanity appears increasingly reclusive.

This study aims to initiate further thought and understanding in the field of human motivation. At its core is a fundamental departure from common practice in generating knowledge and insights.

In recent scientific tradition knowledge and insights are generated in small steps, with in-depth focus on detail. The approach seems to be inspired by a theory of logic commonly known as 'deductive reasoning'. From a theoretical construct, a hypothesis is formulated and verified through observation. A conclusion either confirms or rejects the hypothesis, which, in turn, reflects on the theory. The approach has the advantage of being robust: it gradually progresses on verified and validated knowledge that is often being replicated, adding further to the strength of its findings. Where there is debate, it focuses on distinct and precisely formulated issues, with commonality in concepts that are being propagated. But there is a serious threat in the approach, which has strongly affected the field of social sciences in general, and the study of human motivation in particular.

At the start of the twentieth century, the approach to science was different. Darwin had presented his origin of species, and Marx his philosophy of history. At the turn of the century, Freud brought his views on the origin of subconscious drives, Adler on individual psychology. These theories were inferred from simple but repetitive, often personal observations in an approach commonly referred to as ‘inductive reasoning’. From a series of observations, a pattern is detected, leading to a tentative hypothesis that is explored, leading eventually to a theoretical construct, or ‘model’ after empirical validation. The approach lacks the supremacy of a repeated empirical validation and depends heavily on the premises and argumentations used to substantiate the theoretical construct it infers. But the inductive approach has a characteristic that is almost lacking in deductive reasoning: by its nature it provides complete coverage and a creative uniqueness that almost adds a personal touch to the theories developed in the late nineteenth and early twentieth century.

This dissertation seeks to integrate both approaches. Outcomes of an inductive reasoning are observed and matched with those obtained from research following a deductive approach, as presented in current literature. Empirical research is presented to validate the inductive findings and to further substantiate joint conclusions.

The approach has led to a new theoretical model of human motivation and to the formulation of determinants that are essential in adequately addressing its intricate mechanisms.

If these findings hold true, they appear to lead to a number of profound implications.

May they serve to initiate further thought and understanding in the field of human motivation, and become a step on a journey of a thousand miles towards a human condition that thrives and prospers in a better world...

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Preamble to the Study

In observing activities man sets about, a purpose, an intention, an act of will can be seen. The one intention is clear, precisely orchestrated and aimed at gratification or achievement, the other seems vague with no clear rationale, obscured by subconscious intentions and, at first sight, not aimed at reaching any particular and apparent objective.

All these intentional acts, however, can be regarded as having a common origin in the will of man to intervene in his destiny and his surroundings both mentally and physically. And where the intervention is aimed at securing and protecting his status quo, it has led to intricate arrangements that are, it seems, at the very heart of human nature. The individual is bound by family, personal circumstances, but also, by rituals, regulations and procedures, by treaties and by laws, by agreements and contracts. The will of man to intervene has led to a multitude of instrumental measures to achieve control, ranging from the areas of law and politics, through sociology and psychology to the fields of economy and business science.

Motivation, as it is commonly referred to in literature, extends over a vast area of human activities, and appears to play an essential role in the human condition. And yet, despite a legacy of almost a hundred years of research, precious little is known about the process of motivation, how it emerges, evolves, and matures, how it instigates emotions, cognitions and actions aimed at intervention and control. And where motivation, besides its positive connotation, has a destructive potential on the human condition, no apparent and substantial insights have been generated to prevent almost identical events to re-occur over time.

The objective of this dissertation is to add to our knowledge on these processes conceptualized as 'motivation'.

The study provides an overview of research on the subject performed within a research Project covering a period of almost thirty years. The purpose of this research Project has been to initiate further thought and understanding in the field of human motivation. It's objective has been two-fold:

- *The Project aimed at providing insights into the concept of motivation,*
- *to enable, as its primary objective, to unveil the elementary processes involved in addressing motivation.*

This dissertation is a condensed version of this extensive research Project. It's objective is derived from the Project and is to aim primarily at motivation:

- *This dissertation aims, as its primary objective, at providing insights into the concept of motivation,*
- *to unveil elementary processes involved in addressing motivation.*

Hence, the focus of the research Project has been mainly practical, or instrumental, aimed at capturing essential elements within motivation to quantify and test the effects of various techniques in addressing motivation. This dissertation precedes the research Project in that its focus is mainly theoretical, and aimed at a verification of an assumed conceptualization of motivation.

The dissertation will refer to the formal Project Report and accompanying Appendices as a primal source for its empirical data and for extensive overviews of theoretical analyses.

A pre-publication of the final report will be used as a reference throughout the study, and will be made available prior to its final version that is to appear in 2016.

Reference will be made to: Mennes, M.A. (2016*, in press*)*. De Theatro Motivarum, Management of Motivation: In Search of Essentials. Research into Attitudinal and Technical Competencies as Critical Determinants in Addressing Motivation within a Business Environment*. Amsterdam: Amsterdam University Press, submitted for publication. ISBN/EAN: 978 94 6298 387 8

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Chapter 1
Pre-Fundamentals of the Study

1.1. Introduction

As stated in the Preamble to the study, this dissertation refers in a condensed version to an extensive research Project, with a principal objective to add to our knowledge on processes conceptualized as 'motivation'.

In defining the elementary concepts of motivation, the dissertation follows an approach taken in the research Project that differs from a current scientific tradition in obtaining and validating its theoretical fundamentals.

Preceding a formal presentation of the Problem Statement in Chapter 2, this Chapter provides a background rationale for the principal scientific approach chosen for the study, with reference to an extensive overview in Mennes (2016), in press, with reference to Chapter 1.

1.2. Traditional Scientific Inference: A Shorter Overview

In recent scientific tradition a quest for knowledge proceeds in small steps, where new areas are mapped on a small scale with a restricted scope rather than by covering large areas with broad theoretics[1]. The approach seems to be inspired by a theory of logic commonly known as 'deductive reasoning'. From the first occurrence of scientific thought with Aristotle, Socrates and Plato in ancient Greece until the emergence of modern science following the Renaissance, rationalism was the dominant philosophy. "This method of causal reasoning emphasized deductive reasoning with propositions consisting of premises and a conclusion. (...) In the sixteenth and seventeenth centuries, Francis Bacon, John Locke, and other skeptics of rationalism developed a competing doctrine, known as empiricism, where perceptions of natural phenomena were considered the ultimate source and judge of knowledge for assessing causality" (Kyriacou, 2004, p. 670). Bacon is considered to be the founder of modern inductive method (Russel, 1989)[2], where inductive reasoning was used "(...) to create causal inferences from observed instances to future instances" (Kyriacou, 2004, p. 670).

[1] For an overview of Western scientific tradition reference is made to following standard reviews: Bronowski, & Mazlish, 1970; Clagett, 1969; Gower, 1997; Lindberg, 2007; Suppe, 1977. Within a more general context of philosophy: Russell, 1989; Copleston, 1994.

[2] Inductive reasoning had already been introduced by Aristotle as *επαγωγη* (epagogè)(Milton, 2011; Upton, 1981).

With Hume, a modern philosophy of causation began in the eighteenth century (Russel, 1989). Hume challenged the validity of inductive logic. In addressing validity in defining natural laws, he found a contradiction, defined as Hume's 'problem of induction' (Lange, 2011)[1]: if experience alone can decide upon the truth or falsity of scientific statements, which is "the fundamental thesis of empiricism" (Popper, 1959, 2002, p. 20), an inductive logic could not be used as a means of verification, "because it could not establish an unassailable connection between cause and effect" (Kyriacou, 2004, p. 670). The new doctrine of an inductive logic proved to be insufficient as a fundament for scientific knowledge.

In the early thirties of the twentieth century, Karl Popper developed a form of deductive reasoning to counteract Hume's 'problem of induction' in the observation that hypotheses could never be proven or verified, but only refuted. The thought was both simple and brilliant: the "(...) contradiction arises only if it is assumed that all empirical scientific statements must be 'conclusively decidable', i.e. that their verification and their falsification must both in principle be possible. If we renounce this requirement and admit as empirical also statements which are decidable in one sense only – unilaterally decidable and, more especially, falsifiable – (...), the contradiction disappears: the method of falsification presupposes no inductive inference, but only (...) deductive logic whose validity is not in dispute" (Popper, 1959, 2002, p. 20; see also Popper's exposé, 1963, p. 45, 46) [2] [3].

Inductive reasoning was to be replaced by deductive reasoning. From a theoretical construct, a hypothesis is formulated and verified through observation. Data collection and analysis enables verification. A conclusion either confirms or rejects the hypothesis, which, in turn, reflects on the theory. The approach has the advantage of being robust: it gradually progresses on verified and validated knowledge that is often being replicated, further adding to the strength of its findings. Where there is debate, it focuses on distinct and precisely formulated issues, with commonality in concepts that are being propagated.

The approach seems to hold all the virtues of a '*Logic of Scientific Discovery*'. And ever since Popper's falsification thesis emerged for a broader audience in the early sixties, the approach has prospered. *But there is a serious threat in the approach that has profoundly affected a tradition of scientific inference.*

[1] Although Hume rarely used the word 'induction', "and never in the passages where his inductive scepticism has been located" (Milton, 2011, p. 1)(Milton, 1987). One of the earliest uses of the phrasing of the 'problem of induction' was in J.S. Mill's *'System of Logic',* III. Iii. 3 (Milton, 2011).

[2] Sir Karl Popper's classic, '*The Logic of Scientific Discovery*' first appeared translated into English in 1959, although it had already been published in Vienna as early as 1934 as 'Logik der Forschung' in one of the Vienna Schriften, later published by Springer Verlag in 1935 (Popper, 1935, 1959).

[3] By the approach Popper meant to demarcate science from non-science, which was in his view, the central problem in the philosophy of science (Popper, 1959; Thornton, 2014).

1.3. Deductive-Inductive Inferences

1.3.1. The Acquisition of Scientific Knowledge

At the time Popper presented his thesis in response to Hume's 'problem of induction', the debate aimed primarily at the philosophical foundations of logic. A gradual confusion arose where fundamental philosophical issues on logical reasoning shifted towards a broader arena in acquiring scientific knowledge[1]. As the inductive-deductive notion varies in its manifestation in differing areas in the acquisition of knowledge, a brief overview is provided, restricted only to the acquisition of scientific knowledge[2].

The distinction in differing areas of the inductive-deductive notion is to determine the approach taken in this study and is referred to in Chapter 1.6. in defining its overall structure.

1. Logic of Reasoning

The Inductive-Deductive discussion in acquiring knowledge appears to consist of several areas that are involved in generating scientific knowledge. A first area consists of the *logic of reasoning.* Reasoning is the activity of evaluating arguments. "All arguments involve the claim that one or more propositions (the premise) provide some grounds for accepting another proposition (the conclusion)" (Goel, Gold, Kapur & Houle, 1997, p. 1305). Based on the relation between premise and conclusion, two categories can be observed within a logic of reasoning: induction and deduction.

Inductive reasoning aims at the finding of a rule of principle (Thurstone, 1938). A causal inference is made from an observed instance to a future instance. Or rather, from an observed instance, a generalization, or induction, is made towards the probability of an occurrence in the future. "Ordinarily, it is not practical to examine every member of a class. For one thing, many classes have unlimited numbers of

[1] At the time, induction was referred to as 'generalization from particulars' (Guildford, 1967; Sternberg & Gardner, 1983), Inductive reasoning was referred to as the ability to infer rules from a set of particular instances. Deduction, then, was associated with reasoning from general to particular (Ekstrom, French & Harman, 1976; French, Ekstrom & Price, 1963). However, the differentiation led to controversy (Guilford, 1967; Coldberg, Nester & Cormier, 1982), as instances of inductive inferences from general to particular, from particular to general, from particular to particular and from general to general were reported (Colberg, Nester & Trattner, 1985, Shye, 1988; Skyrms, 1975), or even convergence of both models (Carnap, 1971; Colberg, Nester & Trattner, 1985).

[2] An important area of research has been on the psychological study of acquiring knowledge. Heit (2007) defines the area as the 'process view', or the cognitive psychological processes involved in acquiring knowledge, as opposed to the 'problem view' covering the philosophy of acquiring scientific knowledge. For overviews: Evans, 2008; Feeney & Heit, 2007; Goel & Dolan, 2004; Heit & Rotello, 2008, 2010; Parsons & Osherson, 2001; Rips, 1994; Rotello & Heit, 2009. For a comprehensive overview of psychometric studies: Colberg, Nester & Cormier, 1982.

members. Consequently, induction is ordinarily based on the study of a part of the class membership" (Bright Wilson, 1952, p. 154). As such, induction is reasoning from particular to general. But so is deduction (Colberg, Nester & Trattner, 1985). However, the essential difference with deductive reasoning is that induction is "a type of argument in which the conclusion follows from the premises only with a degree of probability" (Colberg, Nester & Trattner, 1985, p. 682). As such, "the truth of an inductive conclusion is never certain. Even if the premises are assumed to be true, and the inference is a valid inference, the conclusion may be false" (Carnap, 1974, p.20)[1].

In contrast, deductive reasoning aims at establishing 'truth'. "(...) In a deductive argument, the conclusion follows necessarily from the premises: if the premises are true, the conclusion must be true" (Colberg, Nester & Trattner, 1985, p. 682). Therefore, "in deductive logic, inference leads from a set of premises to a conclusion just as certain as the premises (...). If the premises are true, the conclusion cannot be false" (Carnap, 1974, p. 20).

Thus, inductive logic deals with arguments where the premises provide only limited grounds for accepting the conclusion, deductive logic deals with arguments claiming the premises provide absolute grounds for accepting the conclusion (Goel, Gold, Kapur & Houle, 1997).

2. Establishing Proof

In establishing proof of theorems of inductive logic, the "range of evidence" (Carnap, 1971, p. 297) is not contained to its full range. As a consequence, the ability to predict is limited. As such, the aim of induction is "to render the observed phenomena maximally predictable" (Feigl, 1954, p. 24)(Feigl, 1950; Salmon, 1957)[2]. In proofs of theorems of deductive logic, the issue is less complex. As the premises in deductive logic provide absolute grounds for accepting a conclusion, the "range of evidence" is entirely covered to its full range (Carnap, 1971). The

[1] Colberg, Nester & Trattner (1985) refer to this definition, as a definition that is "(...) reiterated by every philosopher and logician who has ever written about induction. It is *the* definition of induction in logic" (p. 682). In the article, reference is made to: Ayer, 1972; Barker, 1967; Black, 1970; Rescher, 1980; Salmon, 1963, 1967; Skyrms, 1975. A complete bibliography is provided: Feigl & Morris, 1969. A formal definition of the rule of induction is provided by Reichenbach, 1944, p. 446-447.

[2] Nonetheless, within philosophy a number of so-called 'Practicalists' (a concept first mentioned by Black, 1954) advocate the view that "statements about the unobserved (...) cannot be known to be true when asserted – or even *probably* true (...)" (Black, 1959, p. 5)(Reichenbach, 1944; Feigl, 1954, 1956). For an overview of the issue: Salmon, 1957 and Lenz, 1958.

conclusion *always* follows given the premises are true[1]. As a consequence, one is assumed one can predict with certainty the occurrence of a future event.

However, the form of inference, or the approach, used in both kinds of proof is the same: "Not only in proofs of theorems of deductive logic but also in those of inductive logic we apply the implicit *deductive* procedures (...). Thus any procedure of proof in any field, also in inductive logic, is ultimately a deductive procedure" (Carnap, 1971, p. 200). As such, establishing proof in an argument can be visualized as a continuum that ranges in degrees of inductive strength (Skyrms, 1975). At one extreme the strength is absolute, or "deductively valid", gradually reducing through "degrees of inductive strength" towards a "worthless" minimum (Skyrms, 1975, p. 12) [2] [3].

3. Establishing Hypotheses

Where hypotheses are meant to capture observations they are the fundament on which scientific knowledge can progress through logic of reasoning and establishing proof: "when a hypothesis has been devised to fit the observed facts, it becomes possible to apply the rules of formal logic and deduce various consequences. Logic does not enter science until this stage is reached" (Bright Wilson, 1952, p. 27).

In establishing hypotheses, the above concept of continuum can be applied according to Carnap (1971). In capturing an observation by means of a hypothesis, in an inductive model *most* of the "range of evidence" is contained in the range of the hypothesis, whereas in a deductive model the "range of evidence" is completely contained in the range of the hypothesis: "deductive logic deals with the relation of total inclusion between ranges. Inductive logic deals with the relation of partial inclusion between ranges" (Carnap, 1971, p. 297).

[1] The modus ponens for a deductive form is formulated: "For any object x, if x has the property P, then x has the property Q. Particular object *a* has the property P. Therefore, particular *a* has the property Q" (Colberg, Nester & Trattner, 1985, p. 683).

[2] *Ibid.,* the modus ponens for an inductive form, differs only in that a probabilistic conclusion is reached regarding object *a*, whereas in the deductive form a necessary conclusion is reached regarding *a*. As such, the so-called 'truth value' of a deductive conclusion "(...) is necessary, whereas that of an inductive conclusion is merely probabilistic" (Colberg, Nester & Trattner, 1985, p. 684).

[3] In a further step towards establishing proof, philosophy also observes approaches to establish proof in both methods that are themselves aimed at establishing truth in an argument. The issue has led to profound debate, initiated by Hume's 'problem of induction', in response to which Popper developed his philosophy of refutationism. The issue was briefly summarized by Haack (1976): "Hume presented us with a dilemma: we cannot justify induction deductively (...), and we cannot justify induction inductively, either, because such a 'justification' would be *circular*" (p. 112).

In essence, then, in devising hypotheses and initiating formal logic towards obtaining scientific knowledge, an attempt is to be made at reaching a highest level of inclusion between ranges.

1.3.2. The Hypothetico-Deductive Approach

In the acquisition of scientific knowledge through a logic of reasoning, establishing proof and establishing hypotheses, this leads to two important implications. In establishing proof, only a highest level of inclusion provides certainty, but at the same time one can never be certain if the observations that have led to a hypothesis cover all possible instances: "despite confirming instances, a hypothesis of a causal relationship between two factors (can) never be completely verified since a single contradictory instance would constitute falsification" (Kyriacou, 2004, p. 670).

To solve this asymmetry between verifiability and falsifiability Popper introduced a philosophy consisting of a continuous generation, elimination, and regeneration of new hypotheses used as explanations for natural phenomena. The 'hypothetico-deductive' approach, as it is commonly referred to (Sankey, 2013; Salkind, 2010), consists of a continuous process of falsification. As visualized in Fig. 1.1., hypotheses, described as "provisional conjectures" (Popper, 1959, 2002, p. 264) are tested, where a null-hypothesis reflects that no observable effects of a test, or treatment condition, will emerge and an alternative hypothesis, that observable effects will occur, and subsequently following the empirical evidence, either confirmed or rejected, or "refuted" as Popper states (Popper, 1959, 2002, p. 24). So long as a hypothesis withstands subsequent tests and is not replaced by another hypothesis, a "degree of corroboration" is gradually established (Popper, 1959, 2002, p. 265). Whereupon subsequent tests in subsequent research further corroborate the findings: "repeated observations and experiments function in science as *tests* of our conjectures or hypotheses, i.e. as attempted refutations" (Popper, 1963, p. 71).

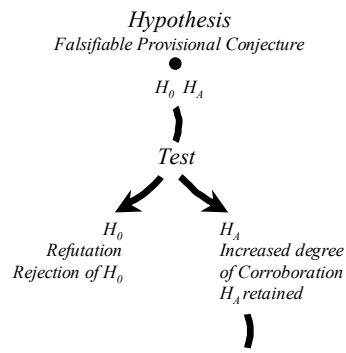


Fig. 1.1.
A Visualized Overview of a hypothetico-deductive approach according to Popper.

1.3.3. *Conclusions*

There are two approaches in the acquisition of scientific knowledge: an inductive

and a deductive logic of reasoning. In establishing proof, a deductive approach prevails, as only a deductive logic provides absolute grounds for accepting a conclusion, given the premises are true. In establishing hypotheses, however, of a causal relationship between two factors a complete verification can never be obtained since a single contradictory instance would constitute a falsification.

To solve this asymmetry between verifiability and falsifiability Popper introduced a philosophy consisting of a continuous generation, elimination, and regeneration of new hypotheses used as explanations for natural phenomena.

1.4. A Divergence in Scientific Method

Thus, in initiating formal logic towards obtaining scientific knowledge, Popper rejected an inductive logic of reasoning, substituting falsifiability in its place (Popper, 1959; Thornton, 2014). However, in his attempt at demarcating science[1], a method of scientific thinking, or theory formation, was introduced that extended far beyond the area's of logic reasoning, establishing proof and establishing hypotheses. Empirical falsifiability became the criterion of the scientific character of theories (Suppe, 1977). A brilliant approach to scientific thought became a scientific approach in itself.

The expansion from a 'scientific philosophy' towards a 'scientific methodology' has had a profound impact. And where the attempt at demarcation of science was aimed at an emerging development of politics and psychology[2], it appears to have affected the social sciences in particular[3].

Based on a 'scientific philosophy', Popper introduced a 'scientific methodology', where the logic of reasoning in establishing proof through hypotheses was expanded towards theory-construction as well[4].

[1] According to Suppe (1977), the development of this doctrine is the central task of Popper's *Logik der Forschung* (1935, 1959). Popper referred to the progress of scientific knowledge as an explicit thesis propounded in his preface to *'The Logic of Scientific Discovery'* (1959, p. xix).

[2] Reference is made to Popper's exposé in *Conjectures and Refutations*, 1963, p. 34-37.

[3] As stated by Thornton (2014): "The dominance of the critical spirit in Einstein, and its total absence in Marx, Freud and Adler, struck Popper as being of fundamental importance: the pioneers of psychoanalysis, he came to think, couched their theories in terms which made them amenable only to confirmation, while Einstein's theory, crucially, had testable implications which, if false, would have falsified the theory itself" (p. 3). Extensive overviews on the impact on social sciences are provided in Simkin, 1993.

[4] As stated by Popper: "systems of theories are tested by deducing from them statements of a lesser level of universality. These statements in their turn, (...) must be testable in like manner – and so *ad infinitum"* (Popper, 1959, 2002, p. 25).

1.5. Foundations for a Divergence in the Approach to the Dissertation

Where the formulation of a hypothesis demarcates the start of the scientific method[1], it is from the formulation of hypotheses that new scientific knowledge emerges. Although the 'scientific methodology' of a hypothetico-deductive approach is firmly rooted in a 'scientific philosophy', it has been extended towards a formulation of hypotheses, for which there is no apparent justification within the restricted boundaries of 'scientific philosophy'.

In generating hypotheses, both inductive and deductive logic can be applied. In fact, it had been a dictum in the first half of the twentieth century, to proceed through inductive reasoning towards a formulation of hypotheses[2]. The approach lacks the supremacy of a repeated empirical validation and depends heavily on the premises and argumentations used to substantiate the theoretical construct it infers. But the inductive approach has a characteristic that is almost lacking in deductive reasoning following the theories of falsification: by its nature it has the potential to provide a complete and comprehensive coverage. In addition, and much in line with scientific tradition in the first half of the twentieth century where theories followed the logic of inductive reasoning as a rule of principle and were inferred from repetitive, often personal observations[3], it adds a personal and creative uniqueness to scientific thinking.

Where 'scientific philosophy' has expanded beyond its boundaries towards a restricted 'scientific approach', this study proclaims a reintroduction of inductive inference in the generation of theoretical constructs, or theoretical 'Models'. Where these theoretical Models lead to clearly defined and constrained hypotheses, they constitute not a departure from, but rather a re-enrichment of hypothetico-deductive tradition[4].

[1] As such, the formulation and identification of hypotheses, is extremely challenging. Bertrand Russell states in the standard reference '*a History of Western Philosophy*': "As a rule, the framing of hypotheses is the most difficult part of scientific work, and the part where great ability is indispensable" (Russel, 1989, p. 529).

[2] As was summarized by Bright Wilson: "hypotheses differ in their subtlety and consequently in the obscurity of their origins. A simple one may be a mere generalization of the observations. More complex hypotheses may postulate connections between events, or elaborate chains of cause and effect" (1952, p. 26).

[3] At the start of the twentieth century, hypotheses were seen as a reflection or approximation of a surrounding world: "the most important feature about a hypothesis is that it is a mere trial idea, a tentative suggestion concerning the nature of things" (Bright Wilson, 1952, p. 26). See also: Cohen & Nagel, 1934; Conant, 1947; Wolf, 1925.

[4] This is, in a different phrasing, the essence of Kuhn's objection to Popper (Kuhn, 1962). As stated by Thornton (2014): "Popper came under philosophical criticism for his prescriptive approach to science and his emphasis on the logic of falsification. This was superseded in the eyes of many by the socio-historical approach taken by Kuhn (...), who – in arguing for the incommensurability of rival (Continued)

Nowhere does Popper's philosophy of refutationism oppose a generation of hypotheses through inductive theoretization, as long as a clear demarcation exists between the theoretical Model and the hypothesis, between theory formation and hypothesis formulation: "The initial stage, the act of conceiving or inventing a theory, seems to me neither to call for logical analysis nor to be susceptible of it. The question how it happens that a new idea occurs to a man – whether it is a musical theme, a dramatic conflict, or a scientific theory – may be of great interest to empirical psychology; but it is irrelevant to the logical analysis of scientific knowledge. (...) Accordingly, I shall distinguish sharply between the process of conceiving a new idea, and the methods and results of examining it logically" (Popper, 1959, 2002, p. 7, 8) [1].

By re-introducing an inductive inference into the process of acquiring scientific knowledge, a number of issues emerge that are to be addressed, notably two closely related concerns referred to as 'immunity to falsification' and 'ad hoc hypothesizing' [2]. A clear demarcation, however, between an inductively inferred theoretical Model and a falsifiable hypothesis within a hypothetico-deductive tradition, serves to address these concerns.

In lieu of observing isolated hypotheses, then, as emphasized in a traditional hypothetico-deductive approach where empirical falsifiability based uniquely on hypotheses has become the criterion of the scientific character of theories, this study proposes a foundation, or embedment, of hypotheses in an inductively inferred theoretical Model, which provides an explanatory framework for phenomena these hypotheses seek to validate. Support from empirical research for an embedded hypothesis thus reflects on the robustness of the explanatory framework or Model. Multiple hypotheses, within multiple empirical studies, embedded in a common explanatory Model further add to its authority.

scientific paradigms – reintroduced the idea that change in science is essentially dialectical (...)" (p. 5, 6).

[1] In two aspects Popper appears to have been, at least partly, responsible for the confusion that arose following *'The Logic of Scientific Discovery'.* First, he was unclear about the distinction between the concepts of 'theory' and 'hypothesis', and appeared to use both concepts interchangingly. E.g. Popper states a few pages further: "(...) the method of critically testing *theories* (my italics), and selecting them according to the results of tests, always proceeds on the following lines. From a new idea, put up tentatively, and not yet justified in any way – an anticipation, *a hypothesis, a theoretical system* (my italics), or what you will – conclusions are drawn by means of logical deduction (Popper, 1959, 2002, p. 9). Second, as stated by Simkin (1993): "It was not until 1959 that *'The Logic of Scientific Discovery'* was published as an English translation (...). The twenty-four year delay was unfortunate in that it gave time for much indirect and garbled reporting of Popper's basic ideas (...) (p. 3).

[2] Immunity to falsification refers to theories that accommodate and explain every possible form of human behavior and are therefore to evade falsification (Popper, 1959, 2002; Thornton, 2014). *Ad hoc hypothesizing,* deals with predictive attributes of theories. When predictions are not in fact borne out, the theory might be "(...) saved from falsification by the addition of ad hoc hypotheses which make it compatible with the facts" (Thornton, 2014, p. 7).

The approach combines the strengths of the inductive and deductive strategies in obtaining knowledge through scientific inference. The deductive strategy with its emphasis on empirical hypothesis-testing appears to be characterized by a restricted approach, often accompanied by attempts at reducing complex phenomena into isolated, fragmentary components. The inductive approach lacks the supremacy of a repeated empirical validation and depends heavily on premises and argumentations, but it has the potential to provide a complete and comprehensive coverage of phenomena.

In a combined approach we thus obtain four clearly differentiated stages:

1) *A theoretical Model ex ante:* a stage demarcating *theory-formation* (following a logic of inductive inference, with reference to Chapter 1.3.1.1.), from a formulation of *hypotheses* prior to testing (that is to follow a deductive logic). Inductive generalizations proposed in a theoretical Model are differentiated from empirically tested deductive findings. *Essential in the theoretical Model is that it provides an explanatory context from which elementary hypotheses, critical to the Model, can be are derived.*
2) *Literature:* from the assumption that theory and research obtained from current literature are derivatives from establishing proof within a mainly deductive tradition, as referred to in Chapter 1.3.1.2., a second stage consists of an embedment of the theoretical Model in literature.
   A two-fold verification:
   - *In Theory:* a verification of the Model with an existing body of knowledge produced by theories that are derived from a mainly deductive tradition, by observing similarities and dissimilarities between those theories and the proposed theoretical Model.
   - *In Research:* a verification of the Model with an existing body of knowledge generated by empirical research that is rooted within a mainly hypothetico-deductive tradition. As such, an embedment is obtained of an inductively inferred Model within a deductively inferred empirical validation.

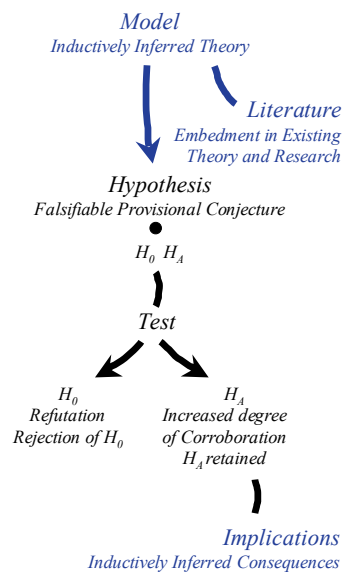


Fig. 1.2.
Foundations for an inductive approach embedded within a hypothetico-deductive approach according to Popper.

3) *Hypothetico-deductive testing:* a stage where hypotheses derived from the theoretical Model are tested according to a traditional hypothetico-deductive approach. *Given that in establishing relevant hypotheses within a deductive context, the "range of evidence" is to be completely contained in the range of the hypothesis, as elaborated on in Chapter 1.3.1.3., only a limited number of hypotheses can be formulated, thus targeting only a limited number of elements from a comprehensive theoretical Model. However, as stated at the start of the present paragraph, multiple hypotheses, within multiple empirical studies, are assumed to reflect on the robustness of the explanatory theoretical Model.*
   In testing, three distinct stages are observed:
   - Hypothesis-formulation,
   - Testing in empirical research,
   - Hypothesis-rejection (Refutation) or acceptance (Corroboration).
4) *Implications ex post:* inductive inferences following deductive testing, and inferred from the theoretical Model upon acceptance of derived hypotheses.

Thus, in the approach taken in this dissertation, the hypothetico-deductive approach is maintained, and 'embedded' within an inductive approach, defined by clearly separated stages, demarcating a transition from inductive to deductive logic[1].

The approach is visualized within the context of a hypothetico-deductive approach in Fig. 1.2.

1.6. The Approach to the Dissertation

This dissertation seeks to integrate the strengths of the inductive and deductive strategies in obtaining knowledge through scientific inference.

These Pre-Fundamental observations, where an 'embedment' is proposed of an inductive approach within a traditional hypothetico-deductive approach, are to determine the overall structure of the study:

[1] By demarcating theory-formation and a formulation of hypotheses a major concern in establishing proof can be eliminated. By separating both stages in the acquisition of scientific knowledge as elaborated on in Chapter 1.3.1., the approach avoids to justify induction inductively as this would create circularity. Referring to Chapter 1.3.1.1., the inductive logic of reasoning producing a theoretical Model cannot establish proof in itself. In establishing hypotheses aimed at establishing proof an attempt is to be made at reaching a highest level of inclusion between a 'range of evidence' and the range of the hypothesis, as indicated Chapter 1.3.1.3., which is not obtained when a theory-formation and a formulation of hypotheses 'coincide'. By demarcating both stages in the acquisition of scientific knowledge, the formulation of a hypothesis becomes a 'statement' whose proof is not affected by its provenance, or the theory-formation that instigated the statement. The issue of establishing proof has led to profound debate, and has been summarized briefly by Haack (1976).

- *A theoretical Model of Motivation: theory-formation, following a logic of inductive inference, is to produce an explanatory theoretical Model of Motivation providing an adequate context from which hypotheses can be derived. The theoretical Model of Motivation is to provide a basis to fulfill the objective of this dissertation, to be defined in Chapter 2, notably Chapter 2.2. and Chapter 2.5.*

  To this end,
  - *The Model is to be explanatory, providing insights in relevant elements, or concepts, and their relations. A separate Chapter is to contain a summarizing overview.*
  - *The Model is to be comprehensive, covering a full overview of elements it contains. Within constraints set to the size of the study, a comprehensive coverage is to be provided in a separate Appendix.*

  In initiating the inductive inference that is to lead to the Model,
  - *A number of so-called 'Fundamental Assumptions' are to be provided, restricting the content of the inductive inference. To this end, an initial Chapter leading to the final Problem Statement of the study is to contain a clear Problem Demarcation.*
  - *Attributes are to be defined, restricting the logic of reasoning in the inductive inference. Summaries are provided in a series of so-called 'Assumptions' preceding the inductive inference. Due to constraints set to the size of the study these Assumptions are to be provided in a separate Appendix, with reference to extensive overviews provided in literature.*
- *Literature: the theoretical Model derived from this process is embedded in an existing body of knowledge obtained from literature. In this manner, the strength of repeated empirical validation, assumed to be produced within a mainly deductive tradition, is connected to the theoretical Model, or elements from the Model, obtained through inductive inference.*

  To this end, in a separate Chapter,
  - *The Model is to be embedded in current theories from literature. The Chapter is to provide a verification of the Model with an existing body of knowledge produced by theories, by observing similarities and dissimilarities between those theories and the proposed theoretical Model.*
  - *The Model is to be embedded in current research from literature. The Chapter is to provide a verification of the Model with an existing body of knowledge generated by empirical research, by observing findings obtained mainly through hypothetico-deductive testing.*
- *Hypothetico-deductive testing: a third phase consists of an empirical validation of hypotheses derived from the theoretical Model following standard statistical procedures within a traditional hypothetico-deductive approach.*
- *Implications: implications are provided separately to segregate the inductive inferences made from the findings obtained from the empirical research.*

1.7. Summary

This study seeks to obtain insights into the concepts that are essential in human motivation. In defining motivation, this dissertation follows an approach that differs from a current scientific tradition in obtaining and validating its theoretical fundamentals. This introductory Chapter aimed at providing the 'Pre-Fundamentals' for the principal scientific approach chosen for the study.

In the second half of the twentieth century, a hypothetico-deductive approach has prevailed to solve an asymmetry between verifiability and falsifiability, consisting of a continuous generation, elimination, and regeneration of new hypotheses used as explanations for natural phenomena. However, in the attempt at clearly demarcating science and scientific practice, a method of scientific thinking was introduced that extended far beyond the area's of logic reasoning, establishing proof and establishing hypotheses. Empirical falsifiability became the criterion of the scientific character of theories. Where 'scientific philosophy' expanded beyond its boundaries towards a restricted 'scientific methodology', deductive inference became predominant and inductive theory-formation was gradually abandoned from scientific practice.

In a departure from a traditional scientific approach this dissertation seeks to integrate inductive and deductive strategies. The study proclaims a reintroduction of inductive inference in the generation of explanatory theoretical constructs, or theoretical 'Models'. Where these theoretical Models lead to clearly defined and constrained hypotheses, they constitute not a departure from, but rather a re-enrichment of hypothetico-deductive tradition. In lieu of observing isolated hypotheses, as emphasized in a traditional hypothetico-deductive approach, this study proposes a foundation, or embedment, of hypotheses in an inductively inferred theoretical Model, which provides an explanatory framework for phenomena these hypotheses seek to validate. Support from empirical research for an embedded hypothesis thus reflects on the robustness of the explanatory framework or Model. Multiple hypotheses, within multiple empirical studies, embedded in a common explanatory Model further add to its authority.

In the combined approach we thus obtain four clearly differentiated stages that are to determine the overall structure of the dissertation:

1) *A theoretical Model ex ante: theory-formation, following a logic of inductive inference, producing an explanatory theoretical Model of Motivation. The Model is to provide a basis to fulfill the objective of this dissertation.*
2) *Literature: from the assumption that theory and research obtained from current literature are derivatives from establishing proof within a mainly deductive tradition, a second stage consists of an embedment of the theoretical Model in literature, both in theory and research.*
3) *Hypothetico-deductive testing: a stage where hypotheses derived from the theoretical Model are tested according to a traditional hypothetico-deductive approach.*
4) *Implications ex post: inductive inferences following deductive testing, and inferred from the theoretical Model upon acceptance of derived hypotheses.*

Chapter 2
Fundamentals of the Study

2.1. Introduction

The objective of the dissertation is to add to our knowledge on processes conceptualized as 'motivation'. It refers in a condensed version to an extensive research Project, from which it derives its principal objective.

Chapter 2 provides the architecture for this objective, by defining a Problem Definition, a Problem Demarcation and a Problem Approach, resulting in a finalized Problem Statement in Chapter 2.5. The Problem Statement provides the fundamentals of the study, leading to a structured outline of a 'Theatro Motivarum'

2.2. Problem Definition

Motivation covers an extensive field of study with an endless area of related topics. At the onset of the study, and referring to Chapter 1.6., a number of restrictions, or 'Fundamental Assumptions', are formulated to demarcate the study and define its content.

This process of gradually reducing the problem and carefully demarcating its boundaries is to be initiated by a preliminary Problem Definition. Restrictions will serve to gradually redefine this preliminary Problem Definition into a final Problem Statement for the dissertation.

As a primary Fundamental Assumption, it is assumed that a distinction is to be made in the concept of motivation and in processes involved in addressing motivation. Although the study has its primal focus on processes involved in motivation, it also seeks to provide insights into the processes involved in addressing motivation, in order to evaluate and appreciate these effects.

Thus, a following two-fold preliminary Problem Definition is formulated:

- *The dissertation aims, as its primary objective, at providing insights into the concept of motivation,*
- *to unveil elementary processes involved in addressing motivation.*

As the concept of motivation is to be used as a restricting concept fundamental to the study, a notation using a capital letter, as in 'Motivation', will be used discriminating the concept from a regular, more conventional usage. The notation using capitals will be used likewise for all concepts throughout this study to differentiate between a theoretical and a common application.

2.3. Problem Demarcation

A number of additional Fundamental Assumptions are made that are further reducing the field of study and demarcating the area to which the Problem Statement is to be confined.

2.3.1. Fundamental Assumptions

In this dissertation a distinction is made between a Process of Motivation and a Process of Interference. *The Process of Motivation in this study is to be defined as including all processes that are involved in intentionally oriented mental activities initiated by an individual that are aimed at intervening in or responding to a surrounding that is perceived by the individual to be either mental or physical, or both. All other processes indirectly related to the Process of Motivation are to be excluded from the analysis.* This restriction further reduces the scope of the study. It eliminates person- and personality related factors, such as age or gender, intellectual capacities or education. The dissertation is to exclude all processes or mechanisms involved in person- and personality related factors. Feelings or emotions, thoughts or cognitions and behavior or activities of the Individual that are not directly related to the Process of Motivation as defined, are to be excluded from the study. In addition, by aiming exclusively at the processes involved, the content, topic, or subject these processes are aiming at, are excluded from the analysis.

An important Fundamental Assumption has already been implicitly made: the study aims at observing a single person not a group of persons. The underlying rationale is that mechanisms involved in addressing a single person will provide fundamental information enabling further insights into the effects on multiple persons, whereas effects on multiple persons are assumed to be less applicable to a single person. This unidirectional applicability justifies the single person approach. Thus, the study aims at unveiling mechanisms involved in Motivation of a single person, and in processes involved when a single person motivates another single person. To this aim the concept of the 'Individual' is introduced.

In observing processes involved in addressing Motivation a principle of unilateralism is introduced: processes are analyzed of an Individual motivating another Individual and not vice-versa. The underlying rationale is that the same mechanisms are assumed to be operational when an Individual motivates another Individual in a unidirectional interaction as in a bidirectional interaction. Although the one process can induce another, both processes are assumed to proceed along comparable lines. In order to provide a clear distinction between both Individuals a differentiation is made between the Individual who is being motivated and a so-called 'Actor-Intervener' whose aim it is to motivate. Thus:

- The Actor-Intervener is the agent who motivates;
- The Individual is the agent being motivated.

In order to further simplify this interaction, it is assumed the activity of addressing Motivation can be clearly defined and isolated from other processes involved and related to, thus enabling an adequate analysis of these distinct processes. To this end, the concept of a 'Process of Interference' is introduced[1]: *The Process of Interference is an activity by the Actor-Intervener aimed at influencing, or addressing Motivation within an Individual. In this dissertation, the Process of Interference refers to all processes and mechanisms involved in the activity of addressing Motivation, thus excluding any other processes, or states of mind, or processes of Motivation generating the Interference. As such, a distinction is made between a Process of Interference associated with the activity of an Actor-Intervener and Motivation associated with the Individual, as the objective of the activity.* Processes that are causing or generating the Interference are considered to be separate and isolated from the Actor-Intervener initiating the act of Interference. Thus, the Motivation, or rationale, or any other processes behind the act of Interference are to be excluded from the analysis. It is assumed the process and state of Motivation and other related processes within the Actor-Intervener follow a same course as within the Individual and would not add to the insights already provided in the analysis of the concept of Motivation associated with the Individual. These processes, then, generating the act of Interference within the Actor-Intervener, are considered given.

It is assumed that the Process of Interference aimed at the Process of Motivation constitutes of three distinct sequential phases, or so-called 'Determinants':

- *A Condition, a Determinant within the Process of Interference that is assumed theoretically from its specific characteristics to generate a circumstance that causes a certain impact, or effect within the Process of Motivation;*
- *A Competency, a Determinant within the Process of Interference that is assumed theoretically to contain specific attributes that initiate the Conditions enabling an effect to occur within the Process of Motivation;*
- *An Instrument, a Determinant within the Process of Interference that is assumed theoretically to facilitate a Competency which, in turn, could generate circumstances where a Condition can cause an effect within the Process of Motivation.*

A Condition is a causal element, a Competency a theoretical characteristic and an Instrument an operational or physical situation that enables the initiation of the Interference to take place.

2.3.2. Fundamental Definitions

Marking the start of the study, the outline of a Problem Statement calls for a summary and specification of definitions that are to be used in its final formulation. Following the gradual reduction of the field of study so far, a number of distinct concepts emerge that have been defined:

[1] The wording of 'Interference' is chosen, as it is assumed to have a neutral, i.e. nor positive, nor negative connotation.

1. *Defining the 'Process of Motivation'*
   In this dissertation the Process of Motivation is to be defined as including all processes involved in intentionally oriented mental activities initiated by the Individual that are aimed at intervening in or responding to a surrounding that is perceived by the Individual to be either mental or physical, or both.
2. *Defining the 'Interaction'*
   The Interaction is the setting in which an Actor-Intervener, through a Process of Interference, addresses a Process of Motivation within an Individual
3. *Defining the 'Individual'*
   The concept of the 'Individual' is reserved for the agent within the Interaction who's Process of Motivation is being addressed.
4. *Defining the 'Actor-Intervener'*
   The concept of the 'Actor-Intervener' is reserved for the agent within the Interaction who addresses through a Process of Interference, a Process of Motivation within the Individual.
5. *Defining the 'Process of Interference'*
   The Process of Interference in this dissertation refers to all processes and mechanisms directly involved in the act of addressing the Process of Motivation within the Individual, by the Actor-Intervener, thus excluding any other processes, procedures, or states of mind, generating the Interference that are originating within the Actor-Intervener. These internal processes within the Actor-Intervener are considered given.
6. *Defining 'Determinants'*
   It is assumed that the Process of Interference aimed at the Process of Motivation consists of three distinct sequential phases, or so-called 'Determinants':
   - *A Condition;*
   - *A Competency;*
   - *An Instrument.*
7. *Defining 'Conditions'*
   A Condition is a Determinant within the Process of Interference that is assumed theoretically from its specific characteristics, or properties, to generate a circumstance that causes a certain impact, or effect within the Process of Motivation.
8. *Defining 'Competencies'*
   A Competency is a Determinant within the Process of Interference that is assumed theoretically to contain specific characteristics, or properties, in actions or activities that initiate the Conditions enabling an effect to occur within the Process of Motivation.
9. *Defining 'Instruments'*
   An Instrument is a Determinant within the Process of Interference that is assumed theoretically to contain specific characteristics, or properties in its design that facilitate a Competency, which, in turn, are assumed to initiate the Conditions enabling an effect to occur within the Process of Motivation.

2.3.3. *Conclusions; A Preliminary Problem Statement*

Fundamental Assumptions have simplified the initial Problem Definition of providing insights into the concept of Motivation and in the processes involved in addressing Motivation.

These gradual reductions now enable us to refine the initial Problem Definition into a first Preliminary Problem Statement:

- *This dissertation aims, as its primary objective, at providing insights into the Process of Motivation,*
- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
    - *into the Conditions necessary for effects to occur within the Process of Motivation,*
    - *into the Competencies initiating the Conditions to come into effect,*
    - *and of exemplary Instruments that provide the means for these Competencies to occur.*

2.4. Problem Approach

Now that the Problem has been demarcated and central concepts of the study have been isolated, the fundamental approach is to be defined, both in form and in content.

2.4.1. The Form

Earlier, in Chapter 1.5., foundations were laid for a differing approach in obtaining insights called for in the Preliminary Problem Statement. Following an overview on inductive and deductive modes of inference, it was concluded that a synthesis of both would combine the strengths of the inductive and deductive strategies in obtaining scientific knowledge and reduce inherent weaknesses.

With reference to Chapter 1.6., the approach would consist of a four-fold sequence:

- *A theoretical Model of Motivation as obtained through inductive inference;*
- *An embedment of the theoretical Model in the existing body of knowledge obtained from literature;*
- *An empirical validation of hypotheses derived from the theoretical Model following standard statistical procedures within a traditional hypothetico-deductive approach;*
- *A separate overview of Implications to segregate the inductive inferences made from the findings obtained from the empirical research.*

2.4.2. The Content

Thus, hypotheses are to be derived from the theoretical Model of Motivation to be tested through empirical research. Support from empirical research for these embedded hypotheses would reflect on the robustness of the explanatory theoretical Model.

However, the Preliminary Problem Statement not only calls for insights into the Process of Motivation by means of a theoretical Model, but also into the Process of Interference and its elementary Determinants.

Within the boundaries set forth in Chapter 2.4.1., combining both requirements in the choice of hypotheses, would allow for a coverage of all the elements called for in the Preliminary Problem Statement within constraints of the study and limitations set to the size in reporting the various research-outcomes. As all Determinants, then, are theoretically derived from the Model of Motivation, hypotheses associated to each Determinant would provide not only insights into the Process of Interference, but would provide also a means of verification reflecting on the robustness of the theoretical Model of Motivation.

The approach is to lead to a four-fold sequence in hypothesis-testing in the problem approach, covering:

- *The Model of Motivation,*
- *Conditions enabling intervention,*
- *Competencies enabling these Conditions,*
- *Instruments providing the means for these Competencies to occur.*

Hypotheses derived from the Model of Motivation are to aim primarily at critical elementary constructs from the Model. Hypotheses associated with the Determinants are to provide indirect, or secondary, evidence of the Model of Motivation from which they are derived, by aiming at an identification of the Determinants, i.e. distinct Conditions, Competencies and Instruments.

Thus, combining a suggested form of the Problem Approach in Chapter 2.4.1., with the four-fold hypothesis testing, would result in a content of the dissertation aimed at providing insights into the Process of Motivation by means of an explanatory theoretical Model, an embedment in literature and empirical research into its elementary constructs, and insights into the Process of Interference by providing an explanatory theoretical Model and an empirical validation for its respective Determinants

2.4.3. Limitations to the Content

A number of limitations are to further restrict the content of the study.

1. Restrictive Limitations on Reporting the Theoretical Model

Referring to Chapter 1.6., two restrictive limitations are set for reporting on the theoretical Model of Motivation and its derived Determinants. First, the inference process itself and associated background rationale is provided in abbreviated form in separate Appendices, with only principal outcomes of the inference process provided in the respective texts for reasons of brevity. The succession of arguments constituting the inference process itself is considered less relevant, where only its outcomes are evaluated with an embedment in literature and a validation in empirical research.

Second, the inductive inference is to be initiated by an overview of initial propositions preceding the inference process. As these initial propositions and restrictions made to the inductive inference process are important in defining its outcomes and are thus part of the evaluative process and inherent validation of the inductive inference process, they are to be briefly included. These successive overviews of propositions will be referred to as 'Assumptions' and are to be provided in shorter summary, with reference to more extensive overviews in respective Appendices.

2. Restrictive Limitations on the Literature

Referring to Chapter 1.6., an overview of current literature is to be provided separately from the overview of the Model of Motivation in a separate Chapter. *As a result, no references to current literature will appear in Chapters covering the empirical research findings.* The analysis will be aimed at coverage of the current literature covering a period of over 100 years, extending from the start of the twentieth century to the present. To enable a sustained accessibility of sources, references to internet-sites will be avoided where possible, as a primal reference.

3. Restrictive Limitations on the Empirical Research

A third and final set of restrictive limitations affects the content of the empirical research. The empirical research is to generate data enabling an adequate analysis of hypotheses associated to the Model of Motivation and the three Determinants derived from the Model.

Although literature seems slightly divergent in its conceptualization, three types of empirical research have been identified: exploratory research aimed primarily at (qualitative) observational studies, descriptive research aimed at quantification of these observations and establishing relations, and causal research seeking evidence not only for relations between concepts but also for defining a sequence or direction in these relations (Gupta, 2007; McNabb, 2010; Silver, Stevens, Wrenn, & Loudon, 2012; Hair, Wolfinbarger Celsi, Money, Samouel & Page, 2011). The empirical research is to provide empirical evidence through all three types of research.

Separate Chapters are to cover each of the four central concepts. The empirical research is initiated by descriptive research on the Model of Motivation, exploratory and descriptive research on Conditions, descriptive research on Competencies and causal research on Instruments, relating these to the Model of Motivation.

Given the Fundamental Assumptions in Chapter 2.3.1. excluding all processes indirectly related to the Process of Motivation or the Process of Interference, an environment is sought after where these indirect processes are minimal, or at least clearly defined, without indistinct interventions. *To this end, the empirical research is to be performed within a business environment, in the assumption that it provides the best setting for an unambiguous environment.* Within a business environment, separate companies are to be observed in the various quasi-experimental designs. Each distinct company is designated with an alias to preserve anonymity. Units within a same company that are differing in location, and/or type of industry or mode of operation, are considered as a distinct company.

2.4.4. *Conclusions*

These observations on the Problem Approach enable a further refinement of the Preliminary Problem Statement:

- *This dissertation aims, as its primary objective, at providing insights into the Process of Motivation,*
  By means of:
  - *A theoretical Model of Motivation as obtained through inductive inference;*
  - *An embedment of the theoretical Model in literature;*
  - *An empirical validation of hypotheses derived from the theoretical Model;*
  - *A separate overview of Implications.*

- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
  - *into the Conditions necessary for effects to occur within the Process of Motivation,*
  - *into the Competencies initiating the Conditions to come into effect,*
  - *and of exemplary Instruments that provide the means for these Competencies to occur.*
    By means of:
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference;*
    - *an empirical validation of hypotheses of respective Determinants,*

      thus providing secondary empirical evidence in support of the Model of Motivation, from which these Determinants are derived.

2.5. Problem Statement

In finalizing the fundamentals of the study, the series of Fundamental Assumptions expressed in the Problem Demarcation, Chapter 2.3., together with the structuring provided in the Problem Approach, Chapter 2.4., enable a formulation of the final Problem Statement, as a principal outcome of this Chapter.

The Problem Statement of this study is formulated as follows:

- *This dissertation aims, as its primary objective, at providing insights into the Process of Motivation,*
  by means of:
  - *a theoretical Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
  - *an embedment in current literature, provided by a brief, annotated overview of principal findings,*
  - *and empirical research providing evidence of the elementary constructs from the Model, in terms of components and their respective items, capturing the Process of Motivation,*

    thus providing empirical evidence in support of the Model,
- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
  - *into the Conditions necessary for effects to occur within the Process of Motivation,*
    by means of:
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
    - *and exploratory and descriptive empirical research providing evidence of the relation between the isolated constructs operationalizing the Process of Motivation and concepts presumed to be indicative of these Conditions,*

      thus providing secondary empirical evidence in support of the Model of Motivation, from which these Conditions are derived,
  - *into the Competencies initiating the Conditions to come into effect,*
    by means of:
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
    - *and descriptive empirical research providing evidence of the relation between concepts presumed to be indicative of these Conditions and concepts operationalizing these Competencies,*

      thus providing secondary empirical evidence in support of the Model of Motivation, from which these Competencies are derived,

- *and into exemplary Instruments that provide the means for these Competencies to occur*[1]*,*
  by means of:
  - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
  - *and empirical research providing evidence for a causal relation to exist between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing these exemplary Instruments,*

    thus providing secondary empirical evidence in support of the Model of Motivation, from which these Instruments are derived.

2.6. The Structure of the Dissertation

Following the final formulation of the Problem Statement in Chapter 2.5., the content of the dissertation can now be formalized in its final structure.

- *Chapter 3, The Process of Motivation - Theoretical Model:* Chapter 3 presents a theoretical Model on the Process of Motivation as outcome of an inductive inference.
- *Chapter 4, Literature:* An overview of the current state of literature on Motivation is provided. In this manner the outcomes of the inference process are to be linked to findings obtained from theory and research.
- *Chapter 5, Empirical Research:* Descriptive research capturing the concept of Motivation, following the Problem Statement.
- *Chapter 6, Empirical Research:* These findings are complemented with both exploratory and descriptive research linking the effects of Conditions to the concept of Motivation and providing empirical evidence for the Conditions allegedly causing these effects to occur.
- *Chapter 7, Empirical Research:* Descriptive research on Competencies initiating the Conditions enabling effects on the Process of Motivation.
- *Chapter 8, Empirical Research:* Causal research linking specific Instruments enabling Competencies to effects on the Process of Motivation.
- *Chapter 9, Conclusions:* A final and formal overview of conclusions in response to the Problem Statement.
- *Chapter 10, Summary:* A synopsis of principal findings.
- *Implications:* An overview of derived Implications following the rationale provided in Chapter 1.5.
  The Implications, together with a subsequent *Epilogue*, are to be the legacy of this dissertation.

[1] A restriction will be made limiting the study to a single Instrument addressing so-called 'Intrinsic Intervention Competencies'. Reference is made to Chapter 8.2.

2.7. Summary

In initiating the study, a two-fold preliminary Problem Definition was formulated:

- *The dissertation aims, as its primary objective, at providing insights into the concept of Motivation,*
- *to unveil elementary processes involved in addressing Motivation.*

In a sequence of Fundamental Assumptions, the initial Problem Definition was gradually reformulated into a first outline of a Preliminary Problem Statement. Four central concepts remained as the elementary framework of the dissertation: a Process of Motivation, addressed by a Process of Interference, consisting of three Determinants: Conditions causing an effect, Competencies evoking these Conditions, and Instruments enabling, in turn, these Competencies.

This sequential reduction restricted the course of this study to a four-fold approach in the analysis.

Thus, in Chapter 2.5., the Problem Statement of this dissertation was formulated, reflecting this four-fold approach in analyzing the Process of Motivation, distinct from the Process of Interference in its three Determinants, to obtain the two-fold objective of the dissertation.

Insights into the Process of Motivation were to be provided by means of an explanatory theoretical Model, an embedment in literature, and empirical validation of hypotheses derived from the explanatory framework of the Model, thus reflecting on its robustness.

Likewise, insights into the Process of Interference and its Determinants were to be provided by means of a theoretical Model, and empirical validation of derived hypotheses. However, as all Determinants were theoretically derived from the Model of Motivation, hypotheses associated to each Determinant were to provide not only insights into the Process of Interference, but would also constitute a means of verification of the theoretical Model of Motivation where multiple empirical studies, derived from a common explanatory Model, were assumed to further add to its authority.

The analysis of a Theatro Motivarum, then, is to progress along these lines, where the Process of Motivation, together with the three Determinants, is to produce theoretical Models and empirical validation of derived hypotheses, that are to generate the insights called for in the Problem Statement.

Chapter 3
The Process of Motivation

3.1. Introduction

The expressions that drive us to deliberately affect the world that surrounds us are routed in what has been conceptualized as 'Motivation'. Motivation was defined as an intentionally oriented mental activity aimed at intervening in or responding to a surrounding that is perceived as either mental or physical, or both. In the initial Chapters, Motivation was found to be too complex to be captured within the constraints of a single dissertation. A great number of restrictions were imposed, gradually reducing its scope.

Based on these Fundamental Assumptions, Chapter 3 is to provide an overview of the Process of Motivation, conceptualized in a Model, following a logic of inductive inference elaborated on in Chapter 1. Referring to Chapter 1.6., the Model is to be both explanatory, providing insights in relevant concepts and their relations, and comprehensive, covering a full overview of elements it contains. Reference is made to Mennes (2016, in press), notably Chapter 3, from which elementary insights are presented, and to a comprehensive overview of the analysis that has led to the formulation of the Model, in Appendix I.

3.2. Assumptions Preceding the Model of Motivation

In referring to Chapter 1.6., in the analysis of the Process of Motivation, a series of restrictive Assumptions are made, that are briefly mentioned.

First, in observing Motivation, different perspectives appear, especially when activities are aimed at intervening in or responding to a surrounding, as defined in Chapter 2.3.2. Referring to Appendix I, Section A.1.2., the concept of 'Perspective' is introduced. From available options, in Section A.1.3.,a Perspective as perceived from the standpoint of the Individual is chosen as a primary mode.

Motivation, then, from the Perspective of the Individual, is the Process that intentionally orients the Individual within a Situation. This conceptualization enables a number of further restrictions to be redefined, as elaborated on in Appendix I, Section A.2.2.:

- *The attributes of the Individual are assumed 'given'*
  It is assumed attributes have no impact on the way the Process of Motivation unfolds. They can influence the *content* of the Process but not the *structure* of the Process itself. In other words: the Process of Motivation is assumed to be the same in each and every Individual. The content may vary, but the Process

is assumed to be stable[1].

- *It is assumed the characteristics of different Situations are 'given'*
  In line with the above observations, it is assumed Situational characteristics might influence the *content* of the Process but not the *structure* of the Process itself. Consequently, the Process of Motivation is assumed to follow a same structure within each and every specific Situation[2].
- *Motivation is considered aiming at an 'objective'*
  The Model assumes the Process is directed towards an 'apparent' entity, or objective[3]. Thus, the objective is conditional to the Process. However, the Model focuses on the Process and not on the content. The Model does not aim at a reason or rationale behind the objectives people formulate[4]. Finally, from the Assumption that the Process evolves around an objective, it is assumed the Process ends, either when the objective is reached, or when the objective initially set, is altered, or discarded. It is assumed that in altering or discarding the objective set, a new Process of Motivation is initiated.

Finally, and elaborated on in Appendix I, Section A.2.3., the study defines the central concept of an 'oriented activity' within Motivation, as a 'Vector'. As such it allows to capture one of the most essential characteristics of the Process of Motivation: the notion of a force aiming at an objective enables to translate, or define the Process of Motivation, not as a static, but rather as an inherently dynamic Process.

Thus, the Model of Motivation aims at describing a dynamic Process as a sequence of distinct Vectors. In providing a description of the successive steps in the Process of Motivation, each step is assumed to be characterized by a change in properties of the Vector.

[1] If we were to include characteristics of the Individual, we would in fact set forward a Model that would depend on a given Individual. Strictly speaking, we would then have a different Model for every Individual.

[2] In accord with the earlier observation on including characteristics of the Individual, when specific aspects of a Situation would be included in the analysis, it would lead to a Model where these aspects are to be accounted for. It would lead, in the strictest sense, to a different Model for every specific Situation.

[3] As a direct implication from this approach the analysis of the Process of Motivation is to include also all subconscious activities, thoughts, and behaviors associated to the intentional behavior aimed at an objective. These subconscious activities, thoughts and behaviors are considered to be part of the Process and are analyzed as such.

[4] Why do people choose the objectives they choose? In examining the question a 'circular reasoning' would appear, as one would be searching for a Motivation behind the Process of Motivation. As assumed earlier, this process would follow a same route as the Process of Motivation itself.

3.3. The Process of Motivation

The dynamic Process of Motivation, then, is captured in a series of distinct steps or so-called 'Stages' as they evolve over time. An assumed change, marking and initiating a next step in the Process.

These Assumptions lead to a Model of Motivation, where subsequent Stages of the Process are organized according to distinct Phases. Human Motivation, in short, is perceived of as an 'inner dialogue', a stepwise, sequential Process progressing through these distinct Phases, that are largely evaluative in nature, where the Individual attempts to reach and secure an objective set, and to limit the effects of outside interferences.

For an extensive overview of the entire inductive analysis, reference is made to a comprehensive overview provided in Appendix I, Sections B.1., B.2. and B.3.

3.3.1. The Process of Motivation
Analysis of a First Cycle

It is assumed the theoretical Model of Motivation consists of eight Phases, each with a number of distinct Stages:

1. A Phase of Expectancies
2. A Phase of Effort
3. A Phase of Internally Evoked Self-Assessment
4. A Phase of Reality
5. A Phase of Impact
6. A Phase of Externally Evoked Self-Assessment
7. A Phase of Anticipated Change
8. A Phase of Dedication

In Fig. 3.1. the eight Phases of the Model are visualized in their sequential order. A number of Phases contain evaluative loops that are cycled through before progressing to a next Phase. The Process of Motivation itself is assumed to be cyclical, where the Process of balancing between objective and interfering Reality gradually takes shape, and reaches an acceptable outcome or is re-defined and terminated.

A description of each Phase and its constituting Stages is presented, with reference to an elaborated overview provided in Appendix I, Section B.1.

1. Phase 1 - A Phase of Expectancies

The Process of Motivation is initiated in a Phase of Expectancies with five Stages that are part of a cognitive process that is anticipatory in nature, where the objective or ‘Goal’ is defined that characterizes the Process of Motivation, and where a careful assessment takes place of expected outcomes.

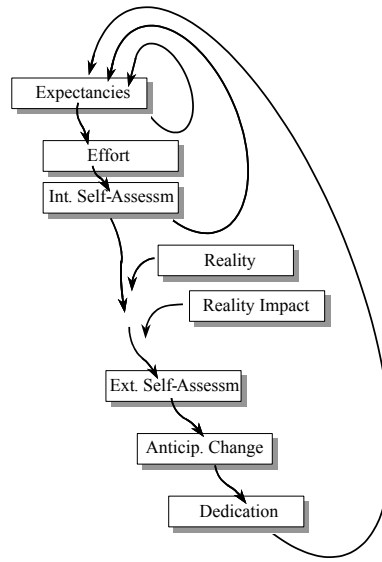


Fig. 3.1.
A visualized overview of the eight Phases in the Theoretical Model of Motivation

It is assumed that a Phase of Expectancies consists of five distinct steps or 'Stages' the Individual proceeds through, before considering taking concrete action:

- *Attitude;* Attitude is the condition of the mind at the start of the Process of Motivation. The Attitude is an 'intentional mental status', an inclination. It is a way of experiencing one's world, reflecting the Individual's unique personality and character that are considered given, following initial Assumptions in Chapter 2.3.1., and subsequently in Chapter 3.2.
- *Goal;* Motivation was defined as 'a Process that intentionally orients the Individual'. By definition, then, and following the Assumptions made in Chapter 3.2. the Attitude must be oriented, and the focus of orientation is an objective. The objective is the key, the central axis in the Process of Motivation. *Without an objective, or 'Goal', there is no Process of Motivation. When the Goal changes, so does the Motivational state. As such, the Goal defines the start and the end of a distinct Motivational Process. If a new Goal is set, a new Process of Motivation starts; if a Goal is fundamentally changed, or discarded, a new Process of Motivation starts.* These initial Assumptions

are essential, for they determine not only where the Process of Motivation starts, *but also where it ends.*

- *Energy;* The initial Stages of the Process of Motivation seem to start not with exploring activities aimed at actually reaching the Goal but rather with an *imaginative* appraisal of the situation, assessing the feasibility to reach what is strived for, and at what cost: it is a 'feasibility study' where all relevant aspects are taken into account. The Process starts with quantifying the Energy one is willing to invest, depending on the value or so-called 'Significance' one attaches to the Goal, or objective[1]. As such, a Stage of Energy is part of a covert, internal, cognitive assessment.
- *Achievement and Failure;* The fourth Stage in the Process of Motivation is an objective, economic evaluation of anticipated success and failure. Given the Attitude, given the Goal and given the Energy one is willing to invest, an assessment is made of the outcomes. The fourth Stage in the Process of Motivation assesses chances of 'Achievement' and 'Failure'.
- *Satisfaction and Frustration;* Next to an objective, economic assessment, it is assumed a subsequent subjective, psychological assessment is made. In a next step of the Process, an assessment of the emotional impact of the various choices is made in a 'Stage of Satisfaction and Frustration'.

It appears that the Process in the first five Stages of Motivation is cyclical in nature. In this cyclical Process the Goal set in mind is either gradually discarded, or fine-tuned and optimized to meet the needs of the Individual. Once the Goal is fine-tuned to the personal Attitude and to the respective levels of Energy, Achievement or Failure, and Satisfaction or Frustration, the Individual either proceeds to readjust the Goal or one or more of its parameters, or to sustain the cyclical Process without any changes. Or, in a final option, to actually carry out the intentions, thus initiating a second Phase in the Process of Motivation.

2. *Phase 2 - A Phase of Effort*

It is assumed a 'Phase of Effort' consists of only one Stage and its most important characteristic is a concrete overt activity aimed at reaching a Goal set forth in the previous Phase. The nature of the activity is such, that a third party can actively respond to the activity, although at this Stage in the Process it is assumed any outside interference has not actually taken place. Where in a Stage of Energy only an assessment is made, this Phase consists of an overt, externally oriented, physical activity to reach the objective set in mind:

- *A Stage of Effort;* This Stage, then, consists of an actual, *physical* action to reach the objective set in mind. The Stage of Effort consists of a tangible, overt, externally oriented activity.

[1] The concept of 'Significance of the Goal' is used, distinct from the concept of 'Significance' as defined in relation to Reality. Reference is made to Chapter 3.3.1.4., Phase 4 - A Phase of Reality.

3. Phase 3 - A Phase of Internally Evoked Self-Assessment

After having set the actual Effort, it is assumed a two-fold evaluative Phase assesses the outcome of this physical attempt at reaching the Goal, both in objective, rational terms and from a subjective, emotional point of view. The Phase consists of two Stages:

- *A Stage of Realization;* The Stage comprises of a double assessment: to what extent was the Stage of Effort successful, and to what extent did it fail?
- *A Stage of Actualization;* While Realization is an objective, rational assessment, a 'Stage of Actualization' introduces emotion and subjectivity. Having invested Effort both the rational and the emotional impact of a Stage of Effort is evaluated.

After the assessment has been made, both objectively and subjectively, it is assumed that usually a number of options emerge. First as an outcome of the Stage of Realization it can be observed that the Goal has been reached, leading to a level of Satisfaction at the Stage of Actualization that justifies no further action. At this point, the Process of Motivation either stops or initial expectations are re-formulated and the Goal adapted accordingly. But most probably, the Goal has not been fully reached according to the Individual, following the double assessment in both Stages. In this case also, either the Process re-starts with a change in parameters, or the Goal is changed, initiating a new Process of Motivation. The Process is brought back to its initial Stages, and becomes cyclical.

It is assumed the Process of Motivation evolves into a cyclical Process that gradually reaches a balance; carefully matching intended Energy and actual Effort to the outcomes expected. But within this 'cocooned balance', chances are that a disruption emerges. It is assumed that in a confrontation with Reality the Process of Motivation dramatically changes into a sequence of Phases aimed at coping…

4. Phase 4 - A Phase of Reality

In a subsequent 'Phase of Reality', or shortly stated as: 'Reality', the Individual is confronted with an unexpected event, or chain of events, that is experienced as interrupting the Process and the balance reached within the first three cycles of the Process of Motivation. It is assumed a Phase of Reality consists of a single Stage:

- *A Stage of Reality;* In this Stage an assessment is made of the importance, or 'Significance' of an event, or chain of events, that interrupts the Process of Motivation[1]. Reality affecting the Process of Motivation is *the subjective experience of Reality as perceived by the Individual.*

[1] The concept of 'Significance' is used, distinct from the concept of 'Significance of the Goal' as previously defined in relation to the Goal. Reference is made to Chapter 3.3.1.1., Phase 1 - A Phase of Expectancies.

5. Phase 5 - A Phase of Impact

In assigning Significance to Reality, the contrast between Reality and the objective set becomes evident. By assigning Significance, the Individual comes to experience the Impact of Reality, given the course intended to reach the objective through the Process of Motivation. The contrast between Reality and Goal could be evident, or could be small with all intermediate options. The Impact of Reality is the gap, or 'Discrepancy', experienced by the Individual between the subjective Reality observed and the Goal set. It is assumed the Phase consists of a single Stage:

- *A Stage of Impact;* The Stage could be positive or negative, and scales on a continuum between both extremes. When the Impact of Reality is positive it enhances the Process of Motivation in the sense that it facilitates the attempt at reaching the Goal, or sustaining the Goal, that had previously been reached. The Impact is negative when it harms the Process of reaching the objective or when it necessitates a re-appraisal of an objective already reached. Its focus therefore is on *distance* and the concept could be symbolized by a 'Δ'.

The Model of Motivation assumes Reality has two dimensions: its Significance, or importance, and its Impact, or 'Discrepancy'. The Impact of Reality is the Discrepancy experienced by the Individual between the Reality observed and the Goal set.

It is assumed the effect of Reality, in terms of Significance and Discrepancy, necessitates a number of intermediate Phases of assessments before a change in objective or parameters can take effect. This re-orientation of the objective versus Reality is assumed to proceed in three subsequent Phases.

6. Phase 6 - A Phase of Externally Evoked Self-Assessment

The first of the three re-orientations of the objective versus Reality focuses on the Goal and the intentions that were initially set: given the new point of view, or the new perspective provided with the introduction of Reality, was it correct to set the objective at a certain level, was the intended Effort correctly chosen, and were subsequent assessments correct, both economically and subjectively?

It is assumed this first re-appraisal proceeds in five Stages:

- *A Stage of Aspiration;* The Stage re-examines the Attitude towards the Goal in its newly perceived context. Given Reality and given the new state of affairs the objective is situated in, the initial Attitude is re-evaluated. At this Stage, no changes are made in Attitude. The Individual is forced to re-examine what the initial settings should have been, without actually altering them.
- *A Stage of Contemplation;* Re-assessing one's position, one's Attitude, leads to a re-assessment of the objective set. The Goal is re-evaluated.
- *A Stage of Validation;* Re-assessing the Goal leads to a re-assessment of its value. The Stage re-evaluates the intended investments, without actually

proceeding to altering these values: 'the metrics are read, before changing the settings'...

- *A Stage of Attainment;* A re-assessment of Attitude and Energy leads to a re-appraisal of Achievement and Failure as initially set.
- *A Stage of Fulfillment*; The Stage originates from the previous Stage of Attainment, and is defined as a re-evaluation of Satisfaction and Frustration associated with reaching the Goal, given its new point of view following the introduction of Reality in the Process of Motivation.

7. Phase 7 - A Phase of Anticipated Change

Following the Impact of Reality, a three-fold evaluative reaction precedes the actual re-adjustments necessary to neutralize the effects of the confrontation. The second of the three evaluative Phases, a 'Phase of Anticipated Change', can be defined as an 'anticipating reflection on change'. It questions the readiness to change the four parameters initially set together with the Goal itself, in an attempt to diminish the Discrepancy, symbolized as 'Δ', between Goal and Reality as perceived in a Phase of Impact.

It is assumed the Phase consists of five Stages. To stress both the aspect of change and its association with the Discrepancy, the symbol 'Δ' is added to each Stage:

- *Δ - Attitude;* The Stage anticipates on an active change in Attitude aimed at closing, increasing or maintaining the Discrepancy between Goal and Reality.
- *Δ - Goal;* The Stage anticipates on an active change in objective.
- *Δ - Energy;* The Stage is defined as anticipating on the presence or absence of change in the Effort invested, aimed at closing, increasing or maintaining the Discrepancy between Goal and Reality.
- *Δ - Achievement and Failure;* The Stage is defined as anticipating on intentions to re-define Achievement and Failure ratios in achieving the objective, aimed at closing, increasing or maintaining the Discrepancy between Goal and Reality.
- *Δ - Satisfaction and Frustration;* The Stage is defined as a moment in the Process where an assessment is made of the readiness to re-define the subjective outcomes in achieving the objective, and aimed at decreasing, increasing or maintaining the Discrepancy between the Goal and Reality.

8. Phase 8 - A Phase of Dedication

It is assumed the Process ends in a 'Phase of Dedication' finalizing the three-fold evaluative reaction towards Reality. It is a 'grand-total' of the Process of Motivation, where all previous Phases play a role in determining a subjective experience of Reality. Reality is perceived by the Individual as supportive, non-supportive or neutral to the way parameters were defined in the initial Phase of Expectancies. These feelings, in turn, give rise to feelings oriented towards Reality.

So, as a result of these four final Stages, a set of 'primary emotions' emerge stemming from a perception of Reality, with a set of 'secondary emotions' directed towards Reality in return. These 'primary emotions' serve to make a representation or an image of Reality that aims at either neutralizing or enforcing its influence on the Process of Motivation. The second set of emotions has only marginal effects on the Process of Motivation itself. The effects are especially noticeable in terms of 'productivity', however. And as such, these last four Stages prove to be of great importance from a perspective to address, or manage the Process of Motivation[1].

In a Phase of Dedication, it is not the Goal but Reality that is the focus of attention. It is assumed, a Phase of Dedication progresses in four Stages[2]:

- *A Stage of Appreciation;* The Stage is defined as an evaluative reaction towards Reality, from a point of view of the Attitude initially set. Basically, Reality can be perceived as providing support, non-support or as being neutral to the initial Attitude, and this perception is largely influenced by both re-assessments in previous Phases of Externally Evoked Self-Assessment and Anticipated Change.
  The assessment of Reality has two important consequences that will prove to affect, not only the Process of Motivation, but also the experience of Reality in a broader sense. If Reality is perceived as supportive to one's Attitude, this will lead to feelings of 'being appreciated', or 'acknowledged', and, as a spin-off, this in turn will lead to feelings of 'appreciation' towards Reality. In parallel, if Reality is perceived as non-supportive this could lead to feelings of 'being denied', or 'ignored' or 'rejected'. And these feelings, in turn, could lead to feelings of 'contempt' towards Reality. The more Reality is perceived as important, or Significant, the more these feelings of 'being appreciated' or 'being ignored' emerge, and, remarkably, the more these will lead to feelings of 'appreciation' or 'contempt' towards Reality in return.
  A second consequence of the assessment of Reality is the effect it has on the Process of Motivation itself. If Reality is perceived as supportive *it enhances the Process of Motivation.* Consequently, if it is perceived as non-supportive, it is assumed *to be disruptive to the Process.*
  These two mechanisms, that are a spin-off of the evaluation of Reality, emerge at all four Stages. By evaluating Reality the Individual tends to use its outcomes to either enhance or neutralize its influence on the Process*. In doing so a dangerous procedure is introduced in the Process of Motivation: the Individual is changing Reality in the way it appears to him.*

[1] The concept of Productivity is further elaborated on in Appendix XXIV, Section B.2.4.4. and Section B.2.7.

[2] In a Phase of Dedication we will deviate from the regular five-fold assessment. An assessment of perceived support or non-support for the Goal initially set, is excluded. The exception is made because an evaluation of perceived acceptance or non-acceptance of the objective is assumed to have taken place earlier in the Process, in a Phase of Impact.

- *A Stage of Approbation;* In a Stage of Reality the Individual attaches Significance to Reality. In a Stage of Reality it is 'the Individual valuing Reality', in this 'Stage of Approbation', it is 'Reality valuing the Individual', or rather: the way the Individual believes or perceives Reality is valuing him.
  In line with the previous Stage, Reality can be perceived as providing support, non-support or as being neutral. And again, this perception depends on both re-assessments in previous Phases.
  A perception of Reality as providing support or non-support leads to feelings of 'being valued' or 'not valued' in return. And these feelings are intensified by the Significance attached to Reality. If the Individual feels supported in his 'value-system', it is assumed he tends to enhance the Impact of Reality by valuing Reality in return. And if he feels a lack of support, it is assumed feelings of 'non-Significance' towards Reality serve to help diminish its importance and neutralize its effects.
- *A Stage of Affirmation;* A next Stage evaluates the support from Reality as perceived by the Individual for his initial economic appraisal of gain or loss. Reality is perceived as either confirming or disapproving his choice. These perceptions of Reality being supportive or non-supportive for his judgment, lead to feelings of 'confirmation' or 'disapproval' from Reality, and these, in turn, are echoed by 'confirming' or 'disapproving' Reality.
  In parallel with previous Stages, a remarkable outcome is observed that *the more one values Reality, the more one either confirms or questions its integrity depending on perceptions of support or non-support. And by doing so, the Individual either increases or diminishes its effects on the Process of Motivation.*
- *A Stage of Commitment;* The 'Stage of Commitment' concludes the evaluations made following the confrontation with Reality. The Stage of Commitment is the 'end of the equation' and the 'grand total' of all the effects experienced from Reality in a condensed format.
  When Reality is perceived as supportive of one's subjective judgments, it is assumed these will lead to feelings of 'worth', of 'making a difference'. The experience of non-support from Reality often leads to extreme polarized reactions. In these instances even 'neutrality' from Reality can be perceived as negative. Where one feels Reality as either 'dedicated', or 'hostile' to one's cause, feelings of 'commitment' or 'hostility' are mirrored to Reality. The perception that one's emotional 'belief-system' is either 'shared' or 'rejected' by Reality, leads to profound feelings towards Reality in return. And these, in turn, serve to further 'propel' the perceived positive or negative interference from Reality on the Process of Motivation.

Following the four final evaluative Stages, only then does the Process proceed into making the adjustments anticipated on. By reverting to a Phase of Expectancies it is assumed the Process of Motivation reaches its final state and becomes cyclical.

3.3.2. The Process of Motivation
Analysis of a Second Cycle: Protective Mechanisms

Motivation is assumed to be an 'inner dialogue', a sequential, partly cyclical Process that intentionally orients the Individual towards a desired status quo of an objective set, leading to evaluative activities aimed at minimizing the effects of an interfering Reality.

In a next step, following the Phase of Dedication, it is assumed there are two options to follow. The first is to re-examine the initial parameters and either make adjustments or leave these settings untouched, without actually changing the objective initially set. The other option is to change the Goal itself, initiating, as per definition, a new Process of Motivation. In either case, redefining initial settings *means the Process of Motivation has re-started with adjustments previously described in a Phase of Expectancies. As such, the Process of Motivation resumes with re-adjustments in a Phase of Expectancies, and, as a result, is assumed to have become cyclical.*

The main characteristic of a second cycle in the Process of Motivation is, that the Individual is now better prepared to face a confrontation with Reality. The experience with Reality now provides the Individual the means to anticipate on its Impact. It is assumed a second Motivational cycle starts with two intentions in mind:

- To further enhance the influence of Reality when its Impact is perceived as positive to the Process of Motivation;
- To reduce the influence of Reality when its Impact is perceived as negative.

This process of enhancing or reducing the influence of Reality is likely to follow profiles that exhibit certain regularities. These recurring patterns aimed specifically at enhancing or reducing the influence of Reality will be referred to as 'Motivational Mechanisms', or 'Mechanisms' for short.

Many Mechanisms emerge in the Process of Motivation when a confrontation with Reality leads to neutralizing counteractive measures in subsequent cycles. Referring to Appendix I, Section B.2., different Mechanisms appear to affect the various Phases of the Process. Three Mechanisms are assumed to be prominent.

1. Motivational Mechanisms Associated with Phases 1, 2 and 3

As the Process of Motivation progresses into a second cycle, scenarios emerge to adequately deal with the effects encountered in a confrontation with Reality during a first cycle, thus preserving the Process of Motivation. In a cyclical Process the Stages in a Phase of Expectancies are carefully re-attuned following the experience with Reality. In re-defining Goal, Energy and Effort the Individual is assumed to anticipate on the interference expected to re-emerge through a renewed confrontation with Reality in an upcoming Phase of Reality in a second cycle of the Process. These Mechanisms aimed at anticipating on an upcoming confrontation with Reality are referred to as 'Mechanisms of Anticipation'.

2. Motivational Mechanisms Associated with Phase 4

Through consecutive cycles the Individual has cocooned a Process preventing the objective from unwanted interference and carefully enhancing positive input, in a confrontation with Reality.

In the Process of Motivation, remarkably, it is not Significance attached to Reality that seems to be changed, but rather the parameters in Phases 1, 2 and 3: especially the Goal and anticipated Energy levels. It is assumed in the Model, that in a Phase of Reality perceived Significance remains intact, and the Individual turns to additional Mechanisms that help reduce unwanted interference so as to sustain, or emphasize, positive effects, and neutralize negative effects of Reality on the Process of Motivation. It is at this point, one turns to previous experiences from a Phase of Dedication that are readily at hand. These Mechanisms are referred to as 'Mechanisms of Representation'.

A Mechanism of Representation, obtained from a Phase of Dedication stemming from a previous cycle in the Process, appears to substitute Reality and is superimposed as an image in lieu of Reality. The more Significance experienced towards Reality, the more amendments are made in a Phase of Expectancies, and the more necessity is experienced in turning to a Representation, either positive or negative. Reality is substituted. And the more Significance experienced the more necessity is felt to create divergence in its Representation: the more Significant Reality is perceived to be, the more Discrepant it appears to be made.

Thus, the Individual changes his perceptions of Reality in an effort to better deal with the effects of interference. It appears, following the Model of Motivation, a confrontation with Reality seldom leads to a straightforward reaction from the Individual, but rather to amendments aimed at orchestrating its effects.

These observations have deep impact on the approaches to be taken in externally inducing behavior through interventions within the Process of Motivation: in most cases the attempts are severely disturbed by Mechanisms neutralizing each input from Reality. Techniques aimed at managing the Process of Motivation will need to address Mechanisms of Anticipation and Representation adequately in order to become effective.

3. Motivational Mechanisms Associated with Phases 5, 6 and 7

As stated earlier, it is assumed that with increased Significance, effects of the Impact from Reality in a previous Phase of Dedication become more prominent. And these effects, in turn, enhance Mechanisms of Anticipation and Representation. As a consequence, it is assumed a perceived Discrepancy is gradually reduced. Mechanisms of Representation are 'smoothing' the interference within the Process of Motivation, thus diminishing a necessity to adapt to Reality. This process of re-adaptation in Phases 5, 6 and 7 to a more suitable Reality, preserving the integrity of

renewed parameters defined in Phases 1, 2 and 3, is referred to as a 'Mechanism of Coping'.

4. Motivational Mechanisms Associated with Phase 8

The process of gradually 'encapsulating' Reality is further enhanced in a Phase of Dedication, where the Individual forms an adjusted Representation of Reality, optimized to his needs at the onset of a next Motivational cycle. The process of transposing an image over Reality leading to a Representation utilized in Mechanisms of Representation to further enhance positive and diminish negative effects, is further elaborated on in a Phase of Dedication within a second cycle. The same strategy that made the Individual change Reality, now leads him to preserve a Representation instead of Reality itself. And through consecutive cycles it is assumed the Individual will come to drift further away from Reality. The Significance attached to Reality further enhances this Mechanism of Representation.

3.3.3. The Process of Motivation
Final Observations

In the Process of Motivation, then, there appears to be a covering up, a hiding of true intentions in order to prevent Failure and Frustration. This disguise of true intentions obstructs an adequate analysis. The Process is not straightforward. Mechanisms of Anticipation and Representation, consolidated in Mechanisms of Coping, appear to obscure insights and prevent a clear understanding of the successive steps the Individual goes through in the Process of Motivation.

Mechanisms of Anticipation, Representation and Coping not only obscure an adequate analysis of the Process, it is also expected to affect accuracy in measurement of Motivation, with profound implications for empirical research. *Given these assumed Mechanisms affect the Process of Motivation, the Individual appears to be a questionable, or even unreliable source to provide an objective assessment of a personal status of Motivation and to adequately detect changes as a result of outside intervention.*

With the principal objective of the study aimed at unveiling the Process of Motivation through a successive analysis of its constituent elements and derived Determinants in the Process of Interference, a precise means of measuring a status of Motivation and detecting change is essential in successfully reaching this objective.

From the analysis provided of the Process of Motivation, and from the observations made on Mechanisms of Anticipation, Representation and Coping affecting the validity of measurements on Motivation, this dissertation will present a departure from common

practice to utilize subjective assessments of Individuals in assessing levels of Motivation[1].

Given the initial Problem Statement, empirical research in Chapter 5 is to provide evidence of elementary constructs of the Process of Motivation. These elementary constructs could provide an alternative for capturing the Process of Motivation.

3.3.4. *Conclusions*
Preamble to a Definition of Hypotheses

An inductive inference has led to the formulation of a Model of Motivation.

Motivation is assumed to be an 'inner dialogue', a Process, largely evaluative in nature, evolving around an objective the Individual seeks to achieve. Assessments are made regulating activities aimed at reaching the objective. In this Process, the Individual is confronted with outside interferences defined as 'Reality'. Surprisingly, instead of integrating these new perspectives from Reality the Individual seems to change Reality, neutralizing its input when its effects are perceived as negative, and emphasizing its input when effects are positive, thus preserving and securing the objective against these interferences. The more Significant the objective initially set, the more these protective Mechanisms apply.

The inductive inference led to identify 24 Stages in the Process of Motivation, contained in 8 different Phases. In summary, the Process of Motivation is assumed to consist of three initial Phases of 'genesis', where the Process of Motivation appears to be initiated and propelled, and five subsequent Phases where the Process protects itself from outside intervention. In conclusion, this would identify both groups as distinct manifestations of the Process of Motivation, with Phases 3 and 8 consolidating the respective effectiveness in both groups.

When assessing levels of Motivation, this would make the evaluative Phases of Internally Evoked Self-Assessment, and Dedication the most important Phases of the Process of Motivation.

Following the initial observations in the Pre-Fundamentals to the Study elaborated on in Chapter 1.5., these outcomes from the inductive inference resulting in the theoretical Model of Motivation in the present Chapter are to provide an explanatory context from which hypotheses, that are critical to the Model, are to be derived and verified through empirical research in Chapter 5. Given the Problem Statement Chapter 2.5., to provide evidence of elementary concepts capturing Motivation, this would identify Phases of Internally Evoked Self-Assessment and Dedication, as crucial elements that are to be elementary in the formulation of those hypotheses.

[1] Reference is made to the observations on literature made in Chapter 4.6.2.1.

3.4. Summary

Based on the Problem Statement formulated in Chapter 2.5. this Chapter aimed at providing insights into the Process of Motivation by means of a theoretical Model.

The Process of Motivation appeared to be an 'inner dialogue', a Process, largely evaluative in nature, evolving around an objective, or 'Goal', the Individual sought to achieve. This subconscious evaluative dialogue was assumed to proceed in a number of distinct, consecutive steps or so-called 'Stages', which could be organized in a number of groups or 'Phases'. These Phases appeared to follow a distinct pattern, each successively evolving into another, at times becoming cyclical before proceeding, with some patterns remaining at their initial Phase, while others evolved throughout all consecutive Phases. The Process of Motivation was assumed to consist of 24 Stages, organized according to 8 distinct Phases:

- *A Phase of Expectancies: a first Phase was assumed to be characterized by a mental evaluative process, where, in an iterative search, gradually the objective was defined. In a cyclical assessment the Individual determined the effort needed to reach the objective, and the objective and subjective revenues the Individual was to expect from this achievement.*
- *A Phase of Effort: this process of mentally balancing expected gains and losses, in a number of cases led to an actual investment. In a subsequent Phase of Effort the Individual was to proceed into action.*
- *A Phase of Internally Evoked Self-Assessment: these concrete activities, or behaviors, were subsequently assessed on their effectiveness of reaching the objective set. And this third Phase, in turn, led to a re-assessment of the parameters initially set in a first Phase of Expectancies, thus turning the Process of Motivation into a cyclical system. These first three Phases of the Process of Motivation were 'self-propelling', gradually progressing into a balanced system.*
- *A Phase of Reality: within this cocooned balance, however, an external unexpected event was assumed likely to occur and disrupt this self-regulated Process. 'Reality' was defined as the external surrounding of the Individual affecting the Process of Motivation. The event was assessed on its perceived importance, or 'Significance'.*
- *A Phase of Impact: depending on its 'Significance', effects of the event on the Process were evaluated in a 'Phase of Impact'.*
- *A Phase of Externally Evoked Self-Assessment: the combination of Significance and Impact initiated a three-fold response. In a first Phase initial parameters defined in a Phase of Expectancies were re-examined on their effectiveness.*
- *A Phase of Anticipated Change: in a next Phase an assessment was made of one's willingness to make adjustments to these initial settings.*
- *A Phase of Dedication: in the last Phase of the Process, the Individual was assumed to assess a perceived support from Reality, which in turn, initiated 'Mechanisms of Representation' where the effects of Reality were either emphasized when perceived as positive and supportive, or neutralized and reduced when experienced as negative and disruptive to the Process of Motivation.*

A number of key concepts appeared to regulate this intricate Process of Motivation: the Goal, or objective, expressed in terms of 'Significance', degrees of invested Effort, and perceived Significance of Reality. And these regulating concepts, in turn, were assumed to affect Mechanisms of Anticipation, Representation and Coping in subsequent cycles of the Process.

Chapter 4
An Analysis of the Literature

4.1. Introduction

The explanatory theoretical Model of Motivation presented in Chapter 3, is reflected on through an analysis of current literature in Chapter 4.

The objective of the present Chapter follows from the Problem Statement as defined in Chapter 2.5.: the dissertation aims primarily at providing insights in the Process of Motivation. Elements from a theoretical Model capturing Motivation are to be connected to findings from literature, both in theory and obtained through empirical research. Thus, following the observations made in Chapter 1.5., a connection, or embedment is to be made between an explanatory theoretical Model and an existing body of knowledge.

4.2. Methodology

In the methodology for an analysis, a distinction will be made into theoretical constructs and the empirical research findings aimed at validation of these propositions.

As set forth in Chapter 1.5., an embedment of the Model of Motivation in current theories from literature, as provided in Chapter 4.4., is to aim primarily at observing similarities and dissimilarities between the Model and those proposed in literature. A methodology is to aim at a verification, not a validation: the analysis is to observe if the Model contains all aspects covered in theories from literature. A visualized overview is to be presented, where constituting elements from the Model of Motivation, i.e. the distinct Stages from the Model, are to be compared to constructs from the various theories in literature. As such, a rationale for a categorization of theories extends beyond the scope of the present study, nor is the analysis to elaborate on the content of the various theories. Thus, the analysis will be restricted to providing overviews of supportive or conflicting theories, or theories containing supplemental findings, by means of a visualized overview.

Likewise, an embedment of the Model of Motivation in current findings obtained from empirical research, as provided in Chapter 4.5., is to aim at observing similarities and dissimilarities in connection to the body of knowledge obtained from a mainly deductive approach. The analysis is to aim at a verification from findings produced from empirical research for constructs as proposed in the Model. An emphasis is to be placed on research following a hypothetico-deductive approach, following the rationale presented Chapter 1.5. Thus, the analysis is to provide overviews of supportive, conflicting and supplemental evidence. In structuring the analysis, an overview according to the various Phases, instead of Stages, is proposed for reasons of brevity.

A number of Assumptions are to restrict the analysis of the literature.

4.3. Assumptions for an Analysis of the Literature
Restricting the Analysis

4.3.1. Restricting the Analysis: Demarcating the Content
Defining Motivation

In Chapter 2.3.1., through a series of Fundamental Assumptions, the object of study was reduced to a Process of Motivation and a Process of Interference. The present Chapter aims at providing an embedment in literature of the Process of Motivation as captured by the Model. To this end, the initial definition used in this study is to be used as a basis for selection of theories presented in literature. In this dissertation, following Chapter 2.3.2., the Process of Motivation is defined as including all processes that are involved in intentionally oriented mental activities initiated by the Individual that are aimed at intervening in or responding to a surrounding that is perceived by the Individual to be either mental or physical, or both.

Thus, theories and empirical findings presented in literature are to be observed, that appear to consider the concept of the Process of Motivation within an equivalent connotation. To prevent bias by excluding non-supportive studies, comments are provided in relevant cases in the overview of theories.

Consequently, the analysis is to *exclude*:

- Neuro-physiological mechanisms of regulation, with the exception of arousal research (e.g.: addiction research, neuro-sensory research, sleeping-waking studies. For overviews see: Petri & Govern, 2013);
- Studies of metabolic mechanisms and endocrinology;
- Studies in psychology that are excluded in accordance to Fundamental Assumptions Chapter 2.3.1. (e.g., studies in emotion, personality, sexuality);
- Likewise, studies in sociology, or involving primarily groups or group dynamics.

4.3.2. Restricting the Analysis: The Content

In congruence with limitations set in Chapter 2.4.3.2., the content of the analysis will be aimed at coverage of the current literature covering a period of over 100 years, extending from the start of the twentieth century to the present.

4.3.3.*Conclusions*

A demarcation is made, restricting the analysis of the literature to theory and research that appear to consider the concept of the Process of Motivation within an equivalent connotation to the definition provided Chapter 2.3.2. The analysis of the literature is to be restricted according to Fundamental Assumptions presented Chapter 2.4.3.2.

4.4. The Analysis of the Literature
Theories of Motivation

An overview is presented of theories obtained from literature, providing an embedment to the Model of Motivation, as visualized in Table 4.1.

The Table depicts the various theories as they relate to the 24 Stages from the Model of Motivation. Theories are numbered with references to primary sources in literature. In addition to the 24 Stages, reference is made to person- or personality features that are not contained in the Model, as commented on in Chapter 2.3.1. and Chapter 3.2. In addition, the Table provides indications for theories with concepts referring to Determinants of the Process of Interference. These elements are included, despite falling outside the scope of the present Chapter, to enable a comprehensive assessment of all theoretical concepts contained in the various theories, and to distinguish those theories that constitute a departure from the definition of Motivation used within this study and are concerned with addressing Motivation through a Process of Interference. These theories have been analyzed in Mennes (2016*, in press*), notably in Chapters 7, 11 and 13.

As a direct consequence, theories that are aimed uniquely at a Process of Interference, rather than a Process of Motivation, are not represented in the Table[1].

Where the emphasis is on embedment in current theories, details on the various theories are limited to an annotated bibliography provided below Table 4.1. For a brief description of the various theories, reference is made to Appendix II, Section A.

A brief analysis is restricted to a short inventory of supportive theories, conflicting theories and supplemental findings.

A first analysis reveals that a vast majority of current theories are contained within the framework of the Model of Motivation, thus providing an embedment of the Model within traditional motivational theories. Although no specific sequence in the overview has been chosen, a rough historical approach was used in the display of theories. From this order, it appears theories have given prominence to different Phases of the Model over time. Roughly, Phases 1, 2 and 3 have been addressed in first theories, among these psychoanalytic and instinct theories, gradually progressing towards Phases 4 and 5 with reinforcement and drive-oriented theories, further extended with emerging arousal and cognitive theories. With achievement theories and expectancy-value theories, the approach progressed towards including Phase 6, with gradual emphasis on causality in Phase 7. With the emergence of attributional theories also Phase 8 appears to have been covered.

Furthermore, a vast majority of theories seem to address distinct aspects from the Model, where very few theories appear to cover an extensive range of the various Phases of the Model. Psychoanalytic theory, cognitive dissonance and attributional theories of

[1] Although these theories are commonly referred to as 'theories of motivation' in current literature. Further reference is made to observations in Chapter 4.6.1.1.

Freud, Festinger and Weiner, respectively, with elements of meaningfulness from Klinger, seem to provide most coverage.

Thus, a vast majority of current motivational theories appear to emerge within the Model of Motivation, providing support and embedment. In addition, each theory provides a distinct element, with only few theories covering all aspects.

Furthermore, from the analysis of theories, no theories could be found that provided a conflicting approach to the Model of Motivation.

Three theories provided supplemental ideas to the Model of Motivation. As further elaborated on in Chapter 4.5.3., field theory of Lewin (1935, 1936, 1938), dynamics of action model from Atkinson & Birch (1970), and goal systems theory initiated by Shah & Kruglanski. (2000), provided elements for a possible extension of the Model towards a multiple approach consisting of multiple Models of Motivation, in observing dynamics in the interplay of various goals and goal-preferences.

Given these observations on the extent at which coverage has occurred, in a final observation, from a slightly different perspective, it appears the Model of Motivation, also provides a comprehensive conceptual framework according to which current motivational theories could be classified.

4.4.1. *Conclusions*

A first analysis of current motivational theories aimed at observing similarities and dissimilarities between the Model of Motivation presented in Chapter 3 and those proposed in current literature. A vast majority of theories appeared to be covered by the Model, thus providing an indication of embedment within traditional motivational theories. Furthermore, most theories appeared to highlight distinct Phases within the Model, with only few theories displaying an extensive coverage of all suggested Phases.

From a first analysis, it appeared no theories were to be found that provided a conflicting approach to the Model.

Three theories provided additional elements to extend the Model of Motivation towards covering multiple goals in observing dynamics of interlinked goals and goal-preferences.

With a majority of theories covering distinct elements from the Model of Motivation, these first conclusions lead to the observation that associated empirical research is expected to produce an extensive range of findings on a vast range of emerging topics.

In a final observation, from a slightly different perspective, it appeared that in the attempt at coverage and embedment, the Model of Motivation provided a comprehensive conceptual framework for classification of current motivational theories.

				Phase 1					2	3	
				Expectancies					Eff.	Internal Self-A.	
Ref.	Theory	Principal Theorist	Person & Personality	1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	6 Effort	7 Realization	8 Actualization
(1)	(2)	(3)	(4)								
1	Hedonism	Bentham						■			■
2	Theory of Ethics	Kant					■				
3	Theory of Emotion	James					■	■		■	■
4	Psychoanal. - Personality	Freud				■	■	■	■	■	■
5	Psychoanal. - Eros & Thanatos	Freud		■	■	■					
6	Psychoanal. - Defense Mechanisms	Freud					■	■		■	■
7	Instinctive Behavior	Lorenz							■		
8	Instinctive Behavior - Energy Model	Tinbergen							■		
9	Instinctive Behavior - Displacement	Ziegler							■		
10	Instinctive Urges	McDougall			▨	■					
11	Instinctive Urges - Agression	Lorenz			■	■			■		
12	Aversive Reaction - Aggression	Tinbergen							■		
13	Catharsis - Aggression	Feshbach et al.			■	■	■	■			
14	Responsiveness - Aggression	Berkowitz							■		
15	Obedience - Aggression	Milgram					■	■	■	■	■
16	Displacement - Aggression	Miller					▨	▨	■	■	■
17	De-Individuation - Aggression	Zimbardo							■		
18	Aggressive Inhibition & Displacement	Adorno et al.	■	■		■	■	■	■	■	■
19	Miller's Conflict Model	Miller					▨	▨	■	■	■
20	Frustration and Aggression	Dollard et al.					■	■	■	■	■

Notes:

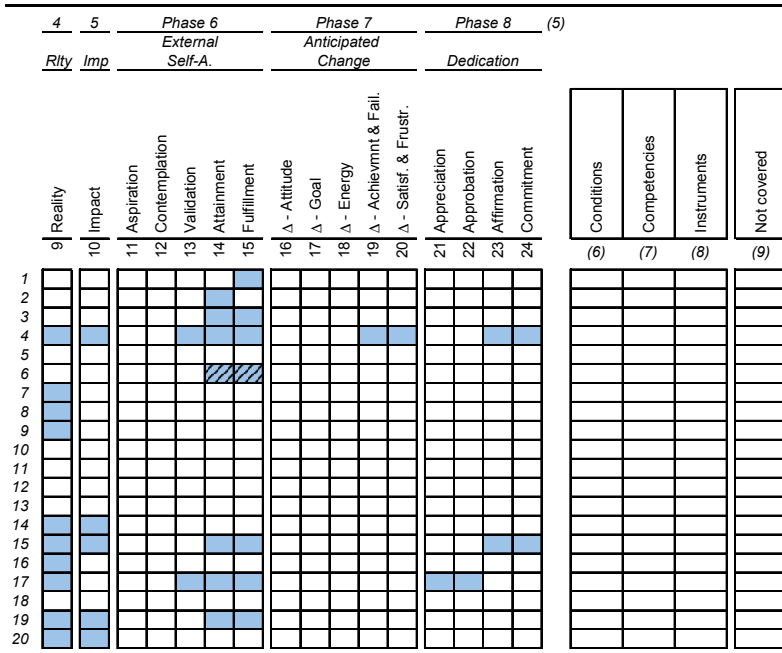
(1) Numbered Reference
(2) Theory Name used as common reference in literature
(3) Principal Theorist associated to Theory
(4) Classification referring to Person- or Personality related variables as commented on in Chapter 3.2.
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

1. *Hedonism (Bentham, 1779).*
2. *Theory of Ethics (Kant, 1785; Section 1, The Three Propositions Regarding Duty, The Good Will).*
3. *Theory of Emotion (James, 1890).*
4. *Psychoanalytic Theory - Personality Theory (Freud, 1900; 1915; 1923; 1933).*
5. *Psychoanalytic Theory - Eros and Thanatos (Freud, 1920; 1930).*
6. *Psychoanalytic Theory - Defense Mechanisms (Freud S., 1895, 1914, 1915a, 1915b, 1917, 1933; Freud A., 1936).*
7. *Instinctive Behavior (Buss, 2005, 2008; Lorenz, 1959; Valle, 1975).*
8. *Instinctive Behavior - Energy Model (Lorenz, 1950; Tinbergen, 1952).*
9. *Instinctive Behavior - Displacement Activity (Ziegler, 1964).*

Table 4.1.

An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



Element or concept from referenced theory as presumed captured within Stages of the Model of Motivation

Element or concept from referenced theory as presumed captured within the Model, with variations in interpretation

(7) Classification referring to Competencies as defined according to Chapter 2.3.2.
(8) Classification referring to Instruments as defined according to Chapter 2.3.2.
(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.

10. *Instinctive Urges (McDougall, 1923, 1970).*
11. *Instinctive Urge – Aggression (Lorenz, 1966; Johnson, 1972).*
12. *Aversive Reaction – Aggression (Tinbergen, 1968).*
13. *Catharsis – Aggression (Feshbach, 1964; Feshbach & Singer, 1971; Ferguson & Rueda, 2010).*
14. *Responsiveness - Aggression (Berkowitz & Geen, 1966; Berkowitz & LePage, 1967; Berkowitz, 1970, 1974).*
15. *Obedience – Aggression (Milgram, 1963; 1964; 1965; 1974).*
16. *Displacement – Aggression (Miller, 1959).*
17. *De-Individuation – Aggression (Zimbardo, 1969).*
18. *Aggressive Inhibition & Displacement (Adorno, Frenkel-Brunswick, Levinson & Sanford, 1950; Korman, 1974).*
19. *Miller's Conflict Model (Miller, 1944; 1959).*
20. *Frustration and Aggression (Dollard, Miller, Doob, Mowrer & Sears, 1939).*

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

				Phase 1					2	3	
				Expectancies					Eff.	Internal Self-A.	
Ref.	*Theory*	*Principal Theorist*	Person & Personality	1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	6 Effort	7 Realization	8 Actualization
(1)	*(2)*	*(3)*	*(4)*								
21	*Amsel Theory of Frustration*	*Amsel et al.*					■	■	■	■	■
22	*Brown-Farber Theory of Frustration*	*Brown et al.*				■	■	■	■	■	■
23	*Classical Conditioning*	*Pavlov*				▨			■	■	
24	*Operant Learning*	*Thorndike*				▨			■	■	
25	*Reinforcement Theory*	*Skinner*							■	■	
26	*Amount of Reinforcement Effect*	*Bolles*							■	■	
27	*Quality of Reinforcement Effect*	*Bolles*							■		■
28	*Two-factor Theory of Learning*	*Mowrer*				▨	■	■	■	■	■
29	*Drive*	*Woodworth*				▨			■	■	
30	*Drive Theory*	*Hull*			■	■	▨	▨	■	■	■
31	*Incentive Motivation*	*Spence*			■	■	■	▨	■	■	■
32	*Theory of Emotion*	*Mowrer*			▨	▨	■	■	■	■	■
33	*Latent Learning*	*Tolman*			■	▨	■	■	■	■	■
34	*Central Motive State*	*Bindra*			■	▨	■	▨	■	■	▨
35	*Dual-Link Incentive Effect*	*Overmier et al.*			■	▨	■	■	■	■	■
36	*Intentional Behavior*	*Irwin*			■	▨	■		■		
37	*Dynamics of Behavior*	*Woodworth*			■	▨	■		■	■	
38	*Exploratory Drive Mechanism*	*Konorski*			▨	■	▨		■	■	
39	*Model of Sensoristasis*	*Schultz*				■			■		
40	*Orientation Reflexes*	*Sokolov*				■			■		

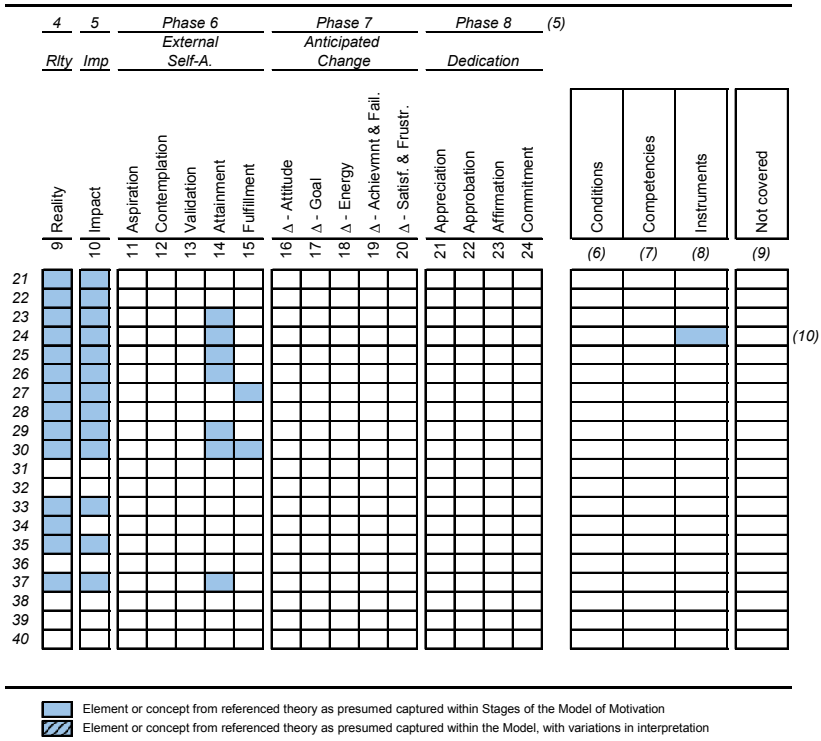
Notes:

(1) Numbered Reference
(2) Theory Name used as common reference in literature
(3) Principal Theorist associated to Theory
(4) Classification referring to Person- or Personality related variables as commented on in Chapter 3.2.
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.
(7) Classification referring to Competencies as defined according to Chapter 2.3.2.

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

21. Amsel Theory of Frustration (Amsel, 1958, 1967, 1972; Amsel & Ward, 1954, 1965; Amsel & Roussel, 1952).
22. Brown-Farber Theory of Frustration (Brown & Farber, 1951; Haner & Brown, 1955).
23. Classical Conditioning (Pavlov, 1960).
24. Operant or instrumental learning (Miller, 1963; Thorndike, 1911, 1913).
25. Reinforcement Theory (Skinner, 1938).
26. Amount of Reinforcement Effect (AOR) (Bolles, 1967, 1974, 1975).
27. Quality of Reinforcement Effect (QOR) (Bolles, 1967, 1974, 1975).
28. Two-Factor Theory of Learning (Mowrer, 1947).
29. Drive (Woodworth, 1918).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



(8) Classification referring to Instruments as defined according to Chapter 2.3.2.
(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.
(10) Thorndike's Law of Effect contained the first notion of a concept of reward affecting response.

30. *Drive Theory (Hull, 1943, 1951, 1952; Cattell, 1950, 1957, 1965, 1974. For an overview: Madsen, 1974, p. 266-267).*
31. *Incentive Motivation (Hull, 1943, 1951, 1952; Spence, 1956, 1960).*
32. *Theory of Emotion (Mowrer, 1960).*
33. *Latent Learning (Tolman, 1932, 1959; Tolman & Honzik, 1930).*
34. *Central Motive State (Bindra, 1968, 1969, 1972, 1974; Morgan, 1943).*
35. *Dual-Link Incentive Effect (Overmier & Lawry, 1979).*
36. *Intentional Behavior (Irwin, 1971)*
37. *Dynamics of Behavior (Woodworth, 1958).*
38. *Exploratory Drive Mechanism (Konorski, 1967).*
39. *Model of Sensoristasis (Schulz, 1965).*
40. *Orientation Reflexes (Sokolov, 1960, 1963).*

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

				Phase 1					2	3		
				Expectancies					Eff.	Internal Self-A.		
Ref.	*Theory*	*Principal Theorist*	Person & Personality	1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	6 Effort	7 Realization	8 Actualization	
(1)	*(2)*	*(3)*	*(4)*									
41	*Complex Functional System*	*Luria*				■			■			
42	*Images of Achievement*	*Pribram*				■	■	▨	■	■	▨	
43	*Arousal Theory*	*Hebb*				■			■			
44	*Arousal Theory - Sensory Stimulation*	*Dember*				■			■			
45	*Arousal Theory - Behavior*	*Berlyne*			▨	■	■	■	■	■	■	
46	*Arousal Theory - Invigoration*	*Cofer et al.*				■	■	▨	■	■	▨	
47	*Opponent-Process Theory*	*Solomon*				■	■		■	■		
48	*Activation Theory*	*Duffy*			■	■			■			
49	*Affective Arousal*	*Young*				■	▨	▨	■	■	■	
50	*Satiation and Curiosity*	*Fowler*				■	■	■	■	■	▨	
51	*Cognitive Theory of Behavior*	*Baldwin*			■	■	▨	▨	■	■	■	
52	*Field Theory*	*Lewin*			■	■	■	■	■	■	■	
53	*Resultant Valence Theory*	*Escalona*		■	■	■	■	■	■	■	■	
54	*Needs Theory*	*Murray*	■	■	■	■	■	■	■	■	■	
55	*Achievement Motive*	*McClelland et al.*			■	■	■	■	■	■		
56	*Theory of Achievement Motivation*	*Atkinson*	■	■	■	■	■	■	■	■	■	*(11)*
	A - Need for Achievement		■	■								
	B - Expectancy				■	■	■	■	■	■	■	
	C - Value							■			■	*(11)*

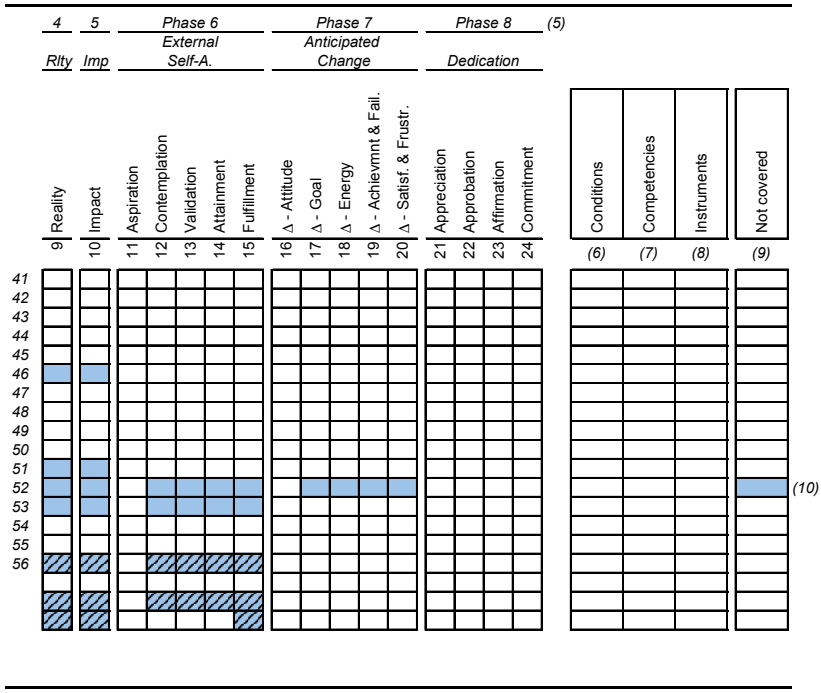
Notes:

(1) Numbered Reference
(2) Theory Name used as common reference in literature
(3) Principal Theorist associated to Theory
(4) Classification referring to Person- or Personality related variables as commented on in Chapter 3.2.
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.
(7) Classification referring to Competencies as defined according to Chapter 2.3.2.

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

41. Complex Functional System (Luria, 1966).
42. Images of Achievement (Pribram, 1971).
43. Arousal Theory (Hebb, 1955; For an overview: Carlson, 2010).
44. Arousal Theory – Sensory Stimulation (Dember, 1956, 1960; Dember & Earl, 1957; Eisman, 1966); For an overview: Suedfeld & Coren, 1989).
45. Arousal Theory – Behavior (Berlyne, 1958, 1959, 1960, 1963).
46. Arousal Theory – Invigoration (Cofer & Appley, 1964).
47. Opponent-Process Theory (Solomon, 1977, 1980; Solomon & Corbit, 1974).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



Element or concept from referenced theory as presumed captured within Stages of the Model of Motivation

Element or concept from referenced theory as presumed captured within the Model, with variations in interpretation

(8) Classification referring to Instruments as defined according to Chapter 2.3.2.

(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.

(10) Reference is made to the concept of regions, barriers and adjacencies in Lewin's Field Theory, as elaborated on in Chapter 4.5.3.1.

(11) Classification referring to the value of success in itself and not associated to the Goal, as used within a Stage of Satisfaction and Frustration and a Stage of Actualization. Reference is made to observations made in Chapter 4.6.1.2.

48. Activation Theory (Duffy, 1962).
49. Affective Arousal (Young, 1936, 1949, 1955, 1959, 1961).
50. Satiation and Curiosity (Fowler, 1967).
51. Cognitive Theory of Behavior (Baldwin, 1969).
52. Field Theory (Lewin, 1935, 1936, 1938, 1948, 1951).
53. Resultant Valence Theory (Escalona, 1939, 1940; Festinger, 1942; Lewin, Dembo, Festinger & Sears, 1944).
54. Needs Theory (Murray, 1938).
55. Achievement Motive (McClelland, Atkinson, Clark & Lowell, 1953).
56. Theory of Achievement Motivation (Atkinson, 1957, 1964).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

Ref.	Theory	Principal Theorist	Person & Personality	Phase 1 Expectancies: 1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	2 Eff.: 6 Effort	3 Internal Self-A.: 7 Realization	8 Actualization	
(1)	*(2)*	*(3)*	*(4)*									
57	*Expectancy-Value Theories*											
58	*Dynamics of Action*	*Atkinson et al.*										*(10)*
59	*Achievement Goal Theory*											
60	*Normative Goal Theory*	*Ames et al.*										
61	*Fear of Success*	*Horner*										
62	*Observational Learning*	*Bandura et al.*										
63	*Social Learning Theory*	*Rotter*										
	Locus of Control											
64	*Behavioral Specificity*	*Mischel*										
65	*Social Learning Theories*											
66	*Personal Causation*	*de Charms*										
67	*Causality Pleasure*	*Nuttin*										
68	*Self-Determination Theory*	*Deci et al.*										
	Cognitive Evaluation Theory											
	Organismic Integration Theory											
	Causality Orientations Theory											
	Basic Psychological Needs Theory											
	Goal Contents Theory											
	Relationships Motivation Theory											

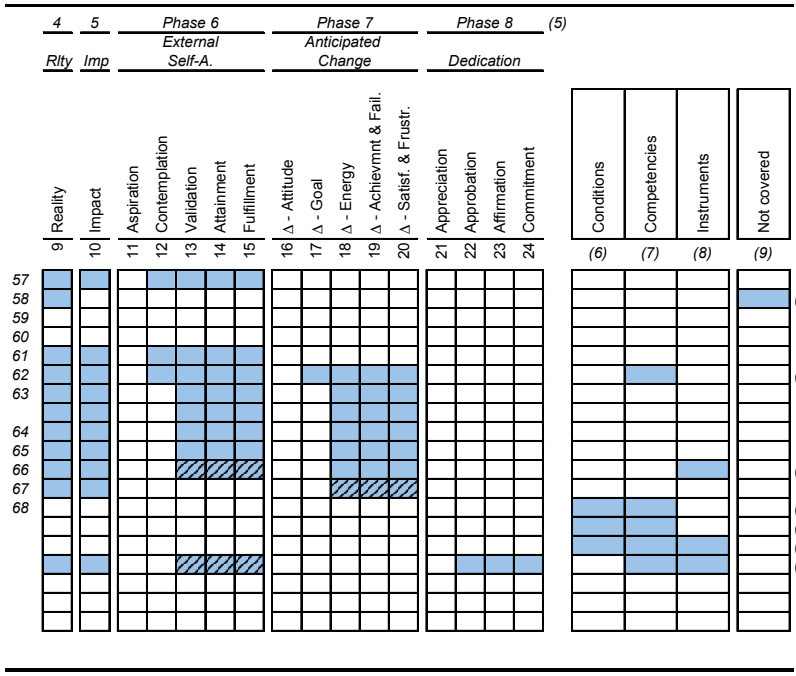
Notes:

(1) Numbered Reference
(2) Theory Name used as common reference in literature
(3) Principal Theorist associated to Theory
(4) Classification referring to Person- or Personality related variables as commented on in Chapter 3.2.
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.
(7) Classification referring to Competencies as defined according to Chapter 2.3.2.
(8) Classification referring to Instruments as defined according to Chapter 2.3.2.
(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.
(10) Classification referring to the value of success in itself and not associated to the Goal, as used within a Stage of Satisfaction and Frustration and a Stage of Actualization. Reference is made to observations made in Chapter 4.6.1.2.

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

57. Expectancy-Value Theory (Atkinson, 1964).
58. Dynamics of Action (Atkinson & Birch, 1970; Birch, Atkinson & Bongort, 1974).
59. Achievement Goal Theory - Refer to: Normative Goal Theory
60. Normative Goal Theory (Ames, 1992; Ames & Ames, 1984; Dweck & Leggett, 1988; Elliott & Dweck, 1988; Nichols, 1984)
61. Fear of Success (Horner, 1972; Horner, 1968).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



(11) Reference is made to the concept of tendencies over time, as elaborated on in Chapter 4.5.3.2.
(12) The theory refers in part to (specific) external Competencies, that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.
(13) The theory refers in part to Instruments influencing perception of being an 'Origin' or a 'Pawn'.
(14) The theory refers in part to Conditions and Competencies that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.
(15) The theory refers in part to Conditions, Competencies and Instruments that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.
(16) The theory refers in part to Competencies and Instruments that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

62. Observational Learning (Bandura 1965; Bandura & Walters, 1963).
63. Social Learning (Rotter, 1954, 1966; Rotter, Chance & Phares, 1972; Rotter & Hochreich, 1975).
64. Behavioral Specificity (Mischel, 1968, 1973, 1976).
65. Social Learning Theories (Liebert & Spiegler, 1974; Weiner, 1980b).
66. Personal Causation (De Charms, 1968, 1972, 1976; De Charms, Morrison, Reitman & McClelland, 1955).
67. Causality Pleasure (Nuttin, 1973).
68. Self-Determination Theory (Deci, 1975, 1980; Deci & Ryan, 1980, 1985, 1991, 2000, 2002, 2008, 2012A, 2012B; Ryan & Deci, 2000).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

				Phase 1					2	3	
				Expectancies					Eff.	Internal Self-A.	
Ref.	Theory	Principal Theorist	Person & Personality	1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	6 Effort	7 Realization	8 Actualization
(1)	(2)	(3)	(4)								
69	Psychological Reactance Theory	Brehm									
70	Learned Helplessness Theory	Seligman									
71	Perceived Freedom	Steiner									
72	Social Cognitive Theory	Bandura									
73	Theory of Cognitive Dissonance	Festinger									
74	Self-Consistency Theory	Aronson									
75	Self-Affirmation Theory	Steel									
76	New Look	Cooper, et al.									
77	Theory of Reasoned Action	Fishbein et al.									
78	Theory of Planned Behavior	Ajzen									
79	Goal Systems Theory	Shah et al.									
80	Correspondent Inference Theory	Jones-Davis									
81	Self-Perception Theory	Bem									

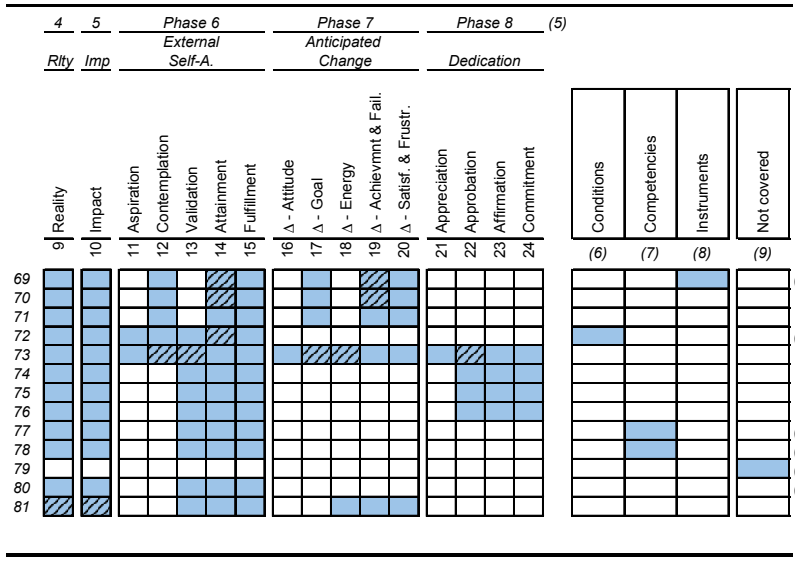
Notes:

(1) Numbered Reference
(2) Theory Name used as common reference in literature
(3) Principal Theorist associated to Theory
(4) Classification referring to Person- or Personality related variables as commented on in Chapter 3.2.
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.
(7) Classification referring to Competencies as defined according to Chapter 2.3.2.
(8) Classification referring to Instruments as defined according to Chapter 2.3.2.
(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

69. Psychological Reactance Theory (Brehm, 1966, 1972).
70. Learned Helplessness Theory (Seligman, 1975).
71. Perceived Freedom (Steiner, 1970)
72. Social Cognitive Theory (Bandura, 1993, 1997, 2000, 2001, 2002, 2006).
73. Theory of Cognitive Dissonance (Festinger, 1957).
74. Self-Consistency Theory (Aronson, 1968, 1992; Aronson & Carlsmith, 1962; Thibodeau & Aronson, 1992)
75. Self-Affirmation Theory (Steel, 1988; Steele & Liu, 1983; Steele, Spencer & Lynch, 1993).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



Element or concept from referenced theory as presumed captured within Stages of the Model of Motivation

Element or concept from referenced theory as presumed captured within the Model, with variations in interpretation

(10) The theory refers in part to Instruments that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

(11) The theory refers in part to Conditions that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

(12) The theory refers in part to (specific) external Competencies, that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

(13) Reference is made to the observed interrelations between goals in Goal Systems Theory, as elaborated on in Chapter 4.5.3.3.

(14) Attribution theories are aimed at assigning causes both to one's own behavior (observer) and to behavior of others (actors). Following restrictions defined in Chapter 2.3.1., causal attributions assigned to others are excluded from the analysis.

76. *New Look (Cooper & Fazio, 1984; Cooper, 1992, 1999; Stone & Cooper, 2000).*
77. *Theory of Reasoned Action (Ajzen & Fishbein, 1980, 2005; Fishbein & Ajzen, 1975).*
78. *Theory of Planned Behavior (Ajzen, 1985, 1991, 2002; Fishbein & Cappella, 2006).*
79. *Goal Systems Theory (Shah & Kruglanski, 2000; Shah, Kruglanski, Friedman, Spencer, Fein & Zanna, 2003).*
80. *Correspondent Inference Theory (Jones & Davis, 1965).*
81. *Self-Perception Theory (Bem, 1967).*

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

				Phase 1					2	3	
				Expectancies					Eff.	Internal Self-A.	
Ref.	Theory	Principal Theorist	Person & Personality	1 Attitude	2 Goal	3 Energy	4 Achievmnt & Fail.	5 Satisf. & Frustr.	6 Effort	7 Realization	8 Actualization
(1)	(2)	(3)	(4)								
82	Covariation Theory	Kelley									
83	Two-Factor Attributional Theory	Schachter									
84	Naïve Attributional Theory	Heider			■	■	■		■	■	
85	Attributional Theory	Weiner			■	■	■	■	■	■	■
86	Personal Construct Theory	Kelly					■	■	■	■	■
87	Meaningfulness	Klinger		▨	■	■	▨	■	■	▨	■
88	Implicit Motivation Theory	Ferguson et al.		■	■	■	■	■	■	■	■
89	Motives in Industry	Viteles			■						
90	Affiliation	Mayo			■						
91	Basic Human Tendencies	Bühler			■		▨	■		▨	■
92	Conditions of Worth	Rogers	■	▨	■	■		■	■		
93	Self-Actualization	Maslow	■	▨	■						■
94	Need Hierarchy	Maslow	■	▨	■		▨	■		▨	■
95	Reformulated Need Hierarchy	Kenrick et al.	■	▨	■						
96	ERG Theory	Alderfer, 1972			■						
97	Rational Choice Theory	Scott, 2000			■	■	■	▨	■	■	▨
98	Control Theory	Carver et al.,1981			■	■	■	■	■	■	■
99	Regulatory Focus Theory	Higgins, 1997	■	▨	■						

Notes:

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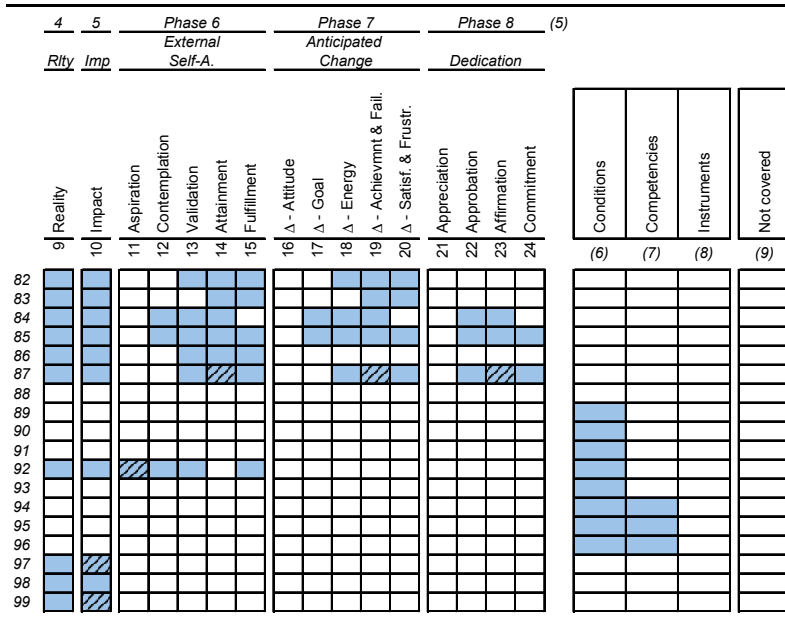
(5) Classification according to the various Phases within the Process of Motivation as defined according to Chapter 3.3.1.
(6) Classification referring to Conditions as defined according to Chapter 2.3.2.
(7) Classification referring to Competencies as defined according to Chapter 2.3.2.
(8) Classification referring to Instruments as defined according to Chapter 2.3.2.
(9) No classification within the various Phases of the Process of Motivation as defined according to Chapter 3.3.1., nor within the

Publications associated to the referenced Motivation theories (for an overview including brief descriptions of each theory: see Appendix II, Section A., Table A.):

82. Covariation Theory (Kelley 1967, 1971, 1972, 1973).
83. Two-Factor Attributional Theory (Schachter, 1964; Schachter & Singer, 1962).
84. Naïve Attributional Theory (Heider, 1944, 1958).
85. Attributional Theory (Weiner, 1985, 2010).
86. Personal Construct Theory (Kelly, 1958, 1966).
87. Meaningfulness (Klinger, 1975, 1977).
88. Implicit Motivation Theory (Ferguson, Hassin & Bargh, 2008).
89. Motives in Industry (Viteles, 1932, 1953).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.



Element or concept from referenced theory as presumed captured within Stages of the Model of Motivation

Element or concept from referenced theory as presumed captured within the Model, with variations in interpretation

Determinants of the Process of Interference: Conditions, Competencies and Instruments as defined according to Chapter 2.3.2.

(10) Attribution theories are aimed at assigning causes both to one's own behavior (observer) and to behavior of others (actors). Following restrictions defined in Chapter 2.3.1., causal attributions assigned to others are excluded from the analysis.

(11) The theory refers in part to Conditions that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

(12) The theory refers in part to Conditions and Competencies that are defined as Determinants of the Process of Interference, as elaborated on in Chapter 2.3.1.

90. Affiliation (Mayo, 1933; see also: Dunnette & Kirchner, 1965; Roethlisberger, 1977).
91. Basic Human Tendencies (Buhler, 1972; Buhler & Allen, 1972; Buhler & Marschak, 1967).
92. Conditions of Worth (Rogers, 1951, 1959, 1961, 1963).
93. Self-Actualization (Maslow, 1943, 1954, 1971, 1973a, 1973b, 1976; Rogers, 1959, 1961, 1963).
94. Need Hierarchy Theory (Maslow, 1943, 1954, 1959, 1971, 1973a, 1973b, 1976).
95. Reformulated Need Hierarchy (Kenrick, Griskevicius, Neuberg & Schaller, 2010).
96. ERG Theory (Alderfer, 1972).
97. Rational Choice Theory (Scott, 2000).
98. Control Theory (Carver, 2001; Carver & Scheier, 1981, 1990, 1998, 2012).
99. Regulatory Focus Theory (Higgins, 1997, 2001, 2011; Higgins, Friedman, Harlow, Idson, Ayduk, & Taylor, 2001; Molden & Higgins, 2004, 2008; Scholer & Higgins, 2008; Shah & Higgins, 2001).

Table 4.1. (Continued)
An overview of Motivation theories;
An analysis of elements or concepts within theories as captured within the various Stages of the Model of Motivation.

4.5. The Analysis of the Literature
Empirical Research

Following an analysis of theories, an overview of findings from empirical research is provided, with overviews of supportive evidence, conflicting evidence, and supplemental findings to the Model of Motivation.

In the description of theories the convention is followed, mentioned in Chapter 2.2., to have a notation using capital letters, as in 'Motivation', referring to the Model of Motivation and its related Phases and Stages, as presented in Chapter 3, to discriminate these constructs from those used in literature. Thus, all concepts in literature are referred to in small letters to provide a contrast to those used in the study[1].

4.5.1. Supportive Evidence

An overview is presented of results from literature providing support for findings from the inductive inference. Distinctions are made in the respective Phases of the Model of Motivation, as indicated Chapter 4.2.

1. A Phase of Expectancies

Empirical research starting in the early years of the twentieth century, has produced considerable evidence of regulatory mechanisms as assumed in a Phase of Expectancies preceding behavior, or Effort, within the Process of Motivation, with reference to Chapter 3.3.1.1.

First attempts, however, at providing evidence of subconscious regulatory mechanisms as proposed by Freud (1922, 1927, 1933), were hindered by lack of a research tradition within the psychoanalytic movement that followed after the introduction of his ideas. Freud's psychoanalytic theory only provided a 'new language' with which to examine human action, and with the exception of defense mechanisms, it has generated very few research and empirical support (Weiner, 1980b). Indirectly, however, evidence in support of Freud's theories was obtained from research investigations in two fields of study. A first field was based on assumptions made by Adorno, Frenkel-Brunswick, Levinson, & Sanford (1950) on aggressive inhibition and displacement in research on individuals with characteristics labeled as having a so-called 'authoritarian personality' (for an

[1] To follow a traditional connotation used in the literature presenting the various theories, the convention has not been used in the notes referring to the content of the various theories provided in Appendix II, Section A., Table A.

overview of findings see: Korman, 1974)[1], thus providing a first indication for an internal regulatory mechanism as suggested by Freud, especially indicative of a Stage of Attitude suggested within a Phase of Expectancies. A second field of research, providing indirect empirical evidence for Freud's subconscious regulatory mechanisms in support of those proposed in the Model of Motivation, was based on extensive experimentation following Lewin's Field Theory developed in the nineteen thirties (Lewin, 1935, 1936, 1938; see also: Hall & Lindzey, 1957). Where behavior was assumed by Lewin to be determined by needs, valences and distances, the relative steepness of approach and avoidance activities could be used to operationalize the expression of a number of those subconscious mechanisms. Thus, indirect support for subconscious regulatory mechanisms was provided through research on task recall (Marrow, 1938; Zeigarnik, 1927, with alternative findings by Rosenzweig, 1943; see overviews in Weiner, 1966), and goal substitution (Henle, 1944; Lissner, 1933; Mahler, 1933; Ovsiankina, 1928), amongst others.

Few theories have generated as much research as Lewin's field theory (Elliot & Dweck, Hall & Lindzey, 1957). In the early thirties first empirical evidence was obtained on 'level of aspiration' by Lewin's student Hoppe (1930), later followed by research on goal aspiration (Festinger 1942A; Lewin, Dembo, Festinger & Sears, 1944; Sears, 1942), providing support for a Stage of Attitude as proposed in the Model of Motivation. These early research initiatives were to become a fundament for achievement motivation research in the fifties. As further clarified in covering the suggested circular process in a Phase of Expectancies, these research findings will be further elaborated on in Phases following a Phase of Reality and its Impact, especially Chapter 4.5.1.8.

Empirical evidence at a rudimentary level in support of a Stage of Attitude emerged from research on arousal and on sensory deprivation and (over)stimulation. It appeared in research on arousal that organisms actively seek stimulation (Berlyne, 1958, 1959, 1960, 1963; Dember, 1956; Dember & Earl, 1957; Harlow, 1953; Harlow, Harlow & Meyer, 1950; Hebb, 1966; Heron, 1957, 1961; Montgomery, 1953). The effects of sensory deprivation generally indicate a disruption of normal behavior (Bennett, 1961; Hirsch & Spinelli, 1970, 1971; Riesen, 1961; Thompson & Melzack, 1956; indirect evidence for effects of stimulus deprivation on development was obtained in numerous studies on maternal deprivation, see: Bowlby, 1973; Bowlby & Parkes, 1970; Harlow, 1958; Harlow & Harlow, 1962, 1966; Harlow & Suomi, 1970; Mineka & Suomi, 1978; Mineka, Suomi & Delizio,

[1] The research of Adorno et al., was initiated by the Department of Scientific Research of the American Jewish Committee, following the atrocities and genocide during the Second World War (see also: Sanford, 1956). Together with research of Milgram (1963, 1964, 1965, 1974) in the early sixties, it was one of the very few research initiatives aiming at causes from a psychological perspective.

1981; Sackett, 1967)[1].

In the early fifties, following research on needs and drives, the concept of a Goal emerged in empirical research on motivation. In his 1951 publication, Hull was one of the first to recognize specific Goal related properties as motivators of behavior.

In the nineteen forties and fifties research instigated by Hull provided evidence for the motivational characteristics of needs and drives, providing empirical evidence for the concept of Energy in a Phase of Expectancies and its relation to a Phase of Effort. Physiological deficits, or needs, were assumed to initiate behavior resulting in the offset of those needs. Drives, according to Hull (1943) were the motivational characteristic of need states, instigating behavior. Thus, a drive, or Energy in a Phase of Expectancies, was perceived as a nonspecific energizer of behavior, or activities in a Phase of Effort. The connection between both was researched many times with a general pattern of results indicating a multiplicative relation between both entities: the higher the drive (Energy), the higher the resulting behavior (Effort)(Spence, Farber & McFann, 1956; Spence, Taylor & Ketchel, 1956; Taylor & Chapman, 1955), with evidence of an even exponential relation (Perin, 1942; Williams, 1938). However, shortcomings in these findings have been reported (Weiner, 1972).

Later, in his 1951 publication, Hull included the concept of 'incentive' or 'incentive value', in his final mathematical equation capturing motivation, as an outcome determined by Drive x Habit x Incentive.

Although subsequent research following Hull was more oriented towards actual behavior in a Phase of Effort followed by observable response associations in a Phase of Internally Evoked Self-Assessment and much less at a cognitive level in a Phase of Expectancies, considered only as energizing through drives and incentives, empirical research produced evidence of so-called 'fractional anticipatory (antedating) goal responses' (Galbraith, 1973; Kendler, Karasik & Schrier, 1954; Logan, Beier & Ellis, 1955; Osgood, 1957, Spence, 1956) introduced by Hull in his earlier work (Hull, 1931). These responses were perceived as 'fractional' because they were a prelude to a full stimulus-response cycle, and as 'anticipatory' as the mental or cognitive response was considered as secondary to account for the resulting behavior (for overviews, see: Beck, 1978, 2000; Black, 1969; Bolles, 1975; Logan, 1968). Later, these anticipatory effects that are assumed to occur in Stages of Achievement and Failure, and Satisfaction and Frustration were confirmed in research on emotion (Mowrer, 1960), and incentive motivation (Bolles

[1] The concept of arousal seems to be unclear in its definition used in current research. Arousal could become an objective in itself, thus assuming Goal properties (see Cofer & Appley, 1964). In addition, arousal can provide reinforcing properties, and become an incentive, as covered in Chapter 4.5.1.3.

& Moot, 1972; Trapold & Overmier, 1972)[1].

Evidence for a suggested circular regulating process within a Phase of Expectancies, in which the Goal is gradually fine-tuned to the personal Attitude and to the respective Stages of Energy, Achievement or Failure, and Satisfaction or Frustration, was indirectly obtained from research on effects of task difficulty in achievement motivation. Both individuals with high achievement needs and those with low achievement needs expressed a preference for tasks with intermediate difficulty (Atkinson & Litwin, 1960; Meyer, Folks & Weiner, 1976; see overviews in Meyer, Folkes & Weiner, 1976). According to the Model of Motivation, levels of achievement expressed in Stages of Attitude and Energy are assumed to be regulated by perceived Significance of a Goal, with assessments in Stages of Achievement and Failure, and Satisfaction and Achievement, resulting in a stabilization towards intermediate Goals. Highly Significant Goals are moderated to compensate for Failure, modest Goals prove to be more attainable, and are assumed to evolve towards more desirable and Significant objectives. Both tendencies could account for the observed preference for intermediate difficulty in tasks (for alternative views, refer to: Atkinson & Feather, 1966). More recent research appears to indicate that 'valuing' (i.e. providing Significance) a certain objective, e.g. a course, is a better predictor of students' academic choices, than expectancies of success, indicating a possible predominance of Significance of a Goal over Stages of Achievement and Failure, and Satisfaction and Achievement (Eccles, 1984, 1987; Eccles, Adler, Futterman, Goff, Kaczala, Meece & Midgley, 1983; Eccles, Adler & Meece, 1984; Feather, 1988; Meece, Wigfield & Eccles, 1990; Wigfield & Eccles, 1992, 2002).

Additional confirmation was obtained from research in the fields of expectancy-value, attribution and social-learning theories of motivation. As these theories tend to emphasize a Phase of Reality and its successive Phases following Impact, according to the Model of Motivation, in defining the objective or Goal, these findings are to be reported successively[2],

- In Chapter 4.5.1.6., covering the effects of an assessment
- In Chapter 4.5.1.7., covering the effects of causal inferences
- In Chapter 4.5.1.8., covering the effects of attributions and perceived support

[1] Where the Model of Motivation assumes a feedback loop, this could account for critical observations following the Mowrer-study (Bolles, 1967; Miller, 1963).

[2] An important reason for applying this distinction in presenting the results of expectancy-value research, is that a frequently used concept of 'task difficulty' in these studies, especially generated by Atkinson and his colleagues, was considered to be equivalent to P_S, or probability of success, and evaluated by the subject (and as such part of a Phase of Expectancies), whereas in research initiated by others task difficulty was operationalized by expressions induced by external influences (hence part of Phases affected by a Phase of Reality).

As stated in a recent overview on social cognitive theory, contemporary cognitive theories of motivation postulate that thoughts, beliefs and emotions of the individual are central processes underlying motivation, in contrast to early views that linked motivation primarily to mechanisms of reinforcement and reward (Schunk & Usher, 2012).

2. A Phase of Effort

Empirical evidence for an expression of behavior in a Phase of Effort, as proposed in the Model of Motivation, defined in Chapter 3.3.1.2., was initiated by research on instinct. The concept of instinct has been used since antiquity (Beach, 1955). In the early nineteen thirties, the concept of instinctive urges gradually fell into disfavor among behavioral scientists (Weiner, 1980b). However, ethologists during the 1970's provided empirical evidence for the notion of internal urges striving for expression. Among these, research into sexuality (Masters & Johnson, 1966, 1970, 1974) and aggression (Lorenz, 1966; Johnson, 1972) have been most prominent. Evidence of accumulation of instinctive urges and subsequent reduction after release have produced contradictory results, both in sexual urges (Masters & Johnson, 1966), sexual as related to aggressive urges (Baron, 1974a, 1974b; Baron & Bell, 1977; Donnerstein, Donnerstein & Evans, 1975; Ramirez, Bryant & Zillmann, 1982; Zillmann & Bryant, 1982), and aggression (Feshbach & Singer, 1971, confirming reduction in violent behavior after exposure; whereas Berkowitz & LaPage, 1967; Berkowitz, 1970 report increased hostile expressions; see further: Marler, 1975), indicating that a variety of external interferences greatly influence the expression of these urges. As such, there appears to be empirical evidence indicating that instinctive behavior, as expressed in a Phase of Effort, is dependent on other regulatory mechanisms besides an instinctive urge per se.

The previously mentioned research instigated by Hull provided evidence for a multiplicative relation between a drive (Energy), and the resulting behavior (Effort), with evidence of an even exponential relation (overviews in Bolles, 1975; Brown, 1961).

Following research on learning theories of Pavlov (1960) and Thorndike (1911), drives not only instigated behavior, but appeared to be linked to responses as well. A prior (successfully) linked response was likely to be repeated when the appropriate stimulus would reappear. Thus, associative stimulus-response linkages, or so-called 'habits' emerged together with these drives. Empirical evidence for these so-called 'learned', or 'secondary' drives remained inconsistent (see overviews in: Bolles, 1975). It appears that avoidance research on fear and anxiety provided positive results (Brown, Kalish & Farber, 1951; Miller, 1948; Petri & Govern, 2013; Spence & Taylor, 1951), whereas the evidence for acquired motives based on approach behavior and positive states was not very convincing (Cofer & Appley, 1964; Petri & Govern, 2013).

The instinct, urge or drive in itself, then, together with associative stimulus-response linkages, appeared to be insufficient as a primal source for explaining behavior or expressions in a Phase of Effort.

3. A Phase of Internally Evoked Self-Assessment

Empirical evidence for an additional regulatory mechanism, defined in the Model of Motivation as a Phase of Internally Evoked Self-Assessment, defined in Chapter 3.3.1.3., was obtained through a series of experiments initiated in the early nineteen fifties.

First confirmations appeared following the previously mentioned research of Adorno et al. (1950) on the authoritarian personality, using Freud's theories. Built-up tension as a result of defenses such as repression to control direct gratification, were assumed to be released through displacement mechanisms against figures who were perceived as being acceptable targets of hostility.

In evaluative overviews of empirical studies to demonstrate defense mechanisms, notably repression, however, outcomes failed to be entirely satisfactory (Rapaport, 1942; Weiner, 1966). A number of experimental studies have demonstrated the phenomenon of repression (Clemes, 1964), while others failed to do so[1]. In research conducted by Blum (1961) on perceptual defense mechanisms, subjects were told that any time they perceived three dots on a tachistoscopic display, they would feel anxious according to galvanic skin response measures. These measures confirmed the occurrence of these responses. Blum subsequently trained the subjects 'not to see' the three-dot stimulus. For the 'not seeing' to occur, however, there had to be a registration at a subconscious level of the stimulus first, which was then kept from conscious recognition. In the experiment, Blum was able to demonstrate effects in accordance with the proposed Model of Motivation. Other studies on repression-sensitization, with defenses aimed to avoid anxiety-inducing information, seemed to confirm these findings (Byrne, 1964). Similar observations were made in studies on controlling effects of denial and intellectualization on stress reactions (Lazarus, 1966, 1975; Lazarus & Alfert, 1964; Lazarus, Opton, Nomikos & Rankin, 1965).

In the previously mentioned fundamental research activities initiated by Hull on the association between a drive (Energy), and resulting behavior (Effort), Hull presumed that a drive in itself provided insufficient basis to account for a wide diversity in observed behavior. Drives not only instigated behavior, but appeared to be linked to responses as well. These associative stimulus-response linkages, or

[1] In an overview of research findings, Baumeister, Dale & Sommer (1998) concluded in observing seven defense mechanisms: "Reaction formation, isolation, and denial have been amply shown in studies (...). Undoing (...) is also well documented but does not serve to defend against the threat. Projection is evident (...). Displacement is not well supported (...). No evidence of sublimation was found" (p. 1081).

'habits' were specified by Hull in a mathematical relation as basic determinants of behavior. In the 'Drive x Habit x Incentive' conception of motivation, evidence was obtained for differing effects for approach or avoidance behavior, thus providing support for the distinction made in a Stage of Realization and a Stage of Actualization within a Phase of Internally Evoked Self-Assessment in the Model of Motivation. A change in strength in tendency appeared to be greater for avoidance than for approach as a function of distance from a goal (Miller 1944, 1959; Murray & Berkum, 1955).

Further support for an assumed Phase of Internally Evoked Self-Assessment in the Model of Motivation emerged from empirical research aimed at confirmation of reinforcement theory. Experimental data demonstrated a positive correlation between amount of reinforcement (Stage of Realization) and performance (Effort) (Crespi, 1942; Metzger, Cotton & Lewis, 1957; Zeaman, 1949; for an overview, see: Flaherty, 1982)[1], as well as quality of reinforcement (Stage of Actualization) and performance (Effort)(Elliot, 1928; Panksepp & Trowill, 1971; Simmons, 1924)[2]. Comparable results were found in research on token economies (for a review, see: Matson & Boisjoli, 2009). Thus, evidence appeared to be provided for effects of perceptions of both Achievement and Failure in a Stage of Realization, and Satisfaction and Achievement in a Stage of Actualization on Effort.

The effect of incentive on behavior and motivation was further elaborated on in studies on arousal. Moderate (Fowler, 1967; Hebb, 1966), as well as pronounced changes in arousal (Solomon, 1977, 1980; Solomon & Corbit, 1974) appeared to be reinforcing and instigating behavior. Zuckermann (1994) developed a scale determining the level of arousal and the willingness to take risks in attaining these sensations, providing evidence that these levels vary widely form one person to another.

In the early nineteen sixties, empirical evidence emerged for a curvilinear relation between behavior and arousal, where behavior and level of arousal appeared to progress linearly towards an optimal level of stimulation, beyond which a further increase in arousal produced disorganization and decrements in performance (Berlyne, 1958, 1959, 1960). Although properties of attractiveness (Berlyne) and task difficulty (Broadhurst, 1957) were introduced to account for these results, they produced inconclusive evidence for the empirical findings of a curvilinear relation (Duffy, 1962; Ferguson, 1976; Hokanson, 1969). Where the Model of Motivation suggests alternative Mechanisms to account for consistent findings of curvilinearity, i.e. Significance of the Goal in conjunction to regulating mechanisms associated to Stages of Achievement and Failure and Satisfaction and Achievement, additional empirical research that would include these parameters could provide further confirmation for these assumptions.

[1] The correlation was dubbed the 'amount of reinforcement effect', or AOR, (Bolles, 1975).

[2] The correlation has been referred to as the quality of reinforcement effect, or QOR, (Bolles, 1975).

Evidence for a suggested loop between a Phase of Internally Evoked Self-Assessment and a Phase of Expectancies with a subsequent Phase of Effort was obtained in research on frustration (Adelman & Maatsch, 1955; Amsel, 1958, 1967, 1972; Amsel & Roussel, 1952; Amsel & Ward, 1954, 1965; Ross, 1964), and frustration and aggression (Brown & Farber, 1951 Dollard, Miller, Doob, Mowrer & Sears, 1939; Haner & Brown, 1955; overviews in Johnson, 1972; Lawson, 1965; Yates, 1962). Although in these findings frustration was perceived as a drive (Energy) energizing behavior (Effort) especially in habit-formation, thus confirming research on the Energy – Effort relation mentioned earlier, an important distinction was made that frustration was assumed to be the result of a state resulting from the non-reinforcement of a previously reinforced response, and not as an isolated drive in itself. More in general, research consistently provided evidence of so-called 'secondary reinforcers': stimuli that were repeatedly associated with positive or negative information about a goal appeared to provide reinforcement in their own right, and thus, were not simple stimulus-response connections (Bindra, 1969; Bolles & Moot, 1972; Klinger, 1977; Overmier & Lawry, 1979; Trapold & Overmier, 1972).

In observing the non-symmetrical findings reported earlier in approach and avoidance research where fear and anxiety appeared to provide more prominent results, the curvilinear relation between behavior and arousal mentioned above, could provide an indication for a tendency to give prevalence to Stages of Failure and Frustration rather than Stages of Satisfaction and Frustration in the assessment of Energy and Effort. Research on resultant valence theory, where perceived probability of success and failure was observed in conjunction with task difficulty, produced a further indication for this tendency (Escalona 1939, 1940; Festinger, 1942, Lewin, Dembo, Festinger & Sears, 1944). In addition, effects appeared to generalize from one need area to another, e.g. failure in a skill-related area lowered expectancies for academic recognition (Crandall, 1955). As indicated earlier, these studies were to expand into research on expectancy-value, attribution and social-learning theories of motivation with a more prominent role assigned to a Phase of Reality that are to be covered in Chapter 4.5.1.6, Chapter 4.5.1.7. and Chapter 4.5.1.8.

4. A Phase of Reality

Empirical evidence produced in support of a Phase of Reality, as defined Chapter 3.3.1.4., emerged in the early nineteen fifties and sixties.

Following the Adorno studies (Adorno et al., 1950), a change in focus occurred in studies on the nature of aggression towards environmental factors. Where in the Adorno studies intra-psychic influences were believed to be predominant, the effects of situational factors could not be sufficiently explained (Weiner, 1980b). The general conclusion from the body of research was that intra-psychic influences did not appear to be the only mechanisms to instigate aggression, with situational

factors playing an essential, regulating role (Berkowitz & Geen, 1966; Berkowitz & LePage, 1967; Berkowitz, 1970, 1974; Milgram, 1963, 1964, 1965, 1974; Zimbardo, 1969). However, from these empirical findings the evidence appears to be inconclusive in defining whether Reality instigates aggression, or aggressive behavior is enhanced by situational factors originating from Reality, as the Model of Motivation suggests.

In these observations, however, it is noted that when Reality is the primal source instigating activities, it is considered in this study to be part of a Process of Interference, rather than a Process of Motivation, and reference is made to Mennes (2016, *in* press), notably Chapters 7, 10 and 13 for an overview of empirical findings.

5. A Phase of Impact

Depending on its 'Significance', assessed in a Phase of Reality, effects of an event on the Process of Motivation were assumed to be evaluated in a Phase of Impact in the Model, as stated Chapter 3.3.1.5.

In addition to the empirical findings mentioned earlier on the accumulation of instinctive urges and subsequent reduction after release, empirical evidence was obtained on external stimuli (i.e. a Phase of Reality) perceived to be Significant (a Phase of Impact) and influencing the expression of behavior. In studies on observational learning, perceived reward or punishment of role models influenced subsequent behavior, in aggression (Bandura, 1965; Bandura, Ross & Ross, 1961; Steuer, Applefield & Smith, 1971), and prosocial behavior (Bryan & Test, 1967; Liebert & Poulos, 1971). More recently, these studies were extended with research on effects of role models and prosocial behavior without reward and punishment generating equivalent effects (Grant, 2007, 2008; Grant & Berry, 2011), thus emphasizing the regulatory effects of Reality as suggested in the Model of Motivation.

Although these studies were less explicit in the degree of Significance attributed to Reality, research on delay of gratification and credibility assigned to a latent/manifest (Bandura & Mischel, 1965) or consistent/inconsistent role model (Mahrer, 1956), appeared to provide an indirect indication for an assumed effect of perceived Significance in a Phase of Reality on behavior.

As stated earlier, it is noted in this regard, that when a Phase of Impact, in conjunction with a Phase of Reality is believed to be the primal source instigating the activity, it is considered to be part of a Process of Interference, rather than a Process of Motivation. Reference is made to Mennes (2016, *in press*), notably Chapter 7, Chapter 10 and Chapter 13.

6. A Phase of Externally Evoked Self-Assessment

Evidence of an evaluative Phase of Externally Evoked Self-Assessment, instigated by input provided in a Phase of Reality, as defined Chapter 3.3.1.6., arose from numerous studies following the introduction of achievement theory in research on motivation.

Empirical evidence for effects within a Stage of Aspiration, in which the Attitude towards the Goal is re-examined given the input provided from Reality and given the new state of affairs the objective is situated in, was provided in research on level of aspiration. After receiving (fraudulent) feedback, levels of aspiration (operationalized by selecting a task with differing levels of difficulty) were shifted in a direction reflecting the input from reality, in both avoidance and approach-oriented individuals (Moulton, 1965).

Effects in a Stage of Contemplation, in which the initial Goal is re-assessed, followed research on need for achievement. A reconfirmation of one's abilities, following Reality, among those high in ability was highly related to performance in a Phase of Effort, and among those low in ability a need for achievement was negatively related to performance (Wright, Kacmar, McMahan & Deleeuw, 1995).

Similar findings were obtained confirming the assumptions made on a Stage of Validation, where Energy is re-assessed reflecting input from Reality. Empirical findings in research on persistence of behavior revealed enhancing effects from Reality when an initial mindset appeared to be confirmed: in approach oriented individuals greater persistence was observed in experimental conditions where a task was (incorrectly) suggested to be 'easy', than 'quite difficult', affirming the initial mindset. Conversely, in avoidance oriented individuals greater persistence was observed at the difficult than the easy task (Feather, 1961).

Empirical evidence for a positive effect within Stages of Attainment and Fulfillment following a positive outcome of an external influence (Phase of Reality), was obtained in task performance (Litwin, 1958)[1]. Earlier, Mace (1935) had obtained similar findings, adding that effects were highest when standards were adjusted to the Individual's level of skill and ability, i.e. when a minimal Discrepancy in a Phase of Impact would occur. Similarly, positive effects were reported following a positive outcome of a highly valued (Phase of Impact) external influence (Phase of Reality), in research on effects of occupational status (Strodtbeck, McDonald & Rosen, 1957), occupational choice (Mitchell, 1974; Van Eerne & Thierry, 1996) and student's academic choices (Feather, 1988; with overviews on cultural differences in Dekker & Fischer, 2008). In addition, Weiner (1980b) reported few successful attempts from research reporting similar effects of negative input from Reality, thus providing indirect support of a presumed neutralizing effect of these negative external influences according to the Model of Motivation.

[1] Although Thorndike, as early as 1917 had produced a first research on the relation between satisfaction and productivity, the subject remained ignored for almost 40 years.

More recently, empirical evidence confirming the effects within Stages of Attainment and Fulfillment following external influence from Reality have been produced in research on self-efficacy as a strong predictor of motivation in general, learning, achievement and both academic and work performance (Bandura, 1997; Caprara, Fida, Vecchione, Del Bove, Vecchio, Barbaranelli & Bandura, 2008; Klassen & Usher, 2010; Multon, Brown & Lent, 1991; Sadri & Robertson, 1993; Schunk & Pajares, 2009; Stajkovic & Luthans, 1998)[1].

Finally, in a general analysis of empirical research related to a Phase of Externally Evoked Self-Assessment, in an emerging interest of psychology aimed at the workplace, research appeared on effects of Reality and work performance[2] [3]. Effects of goal-attainment on performance following Reality have been researched in studies related to so-called 'goal-setting theory' (Locke & Latham, 1990), with consistently positive correlations (for an overview: Locke & Latham, 2002; with critical observations in: Latham & Locke, 2009; Locke & Latham, 2009; Ordoñez, Schweitzer, Galinsky & Bazerman, 2009a, 2009b) [4].

[1] However, it is unclear from the various research findings reported, whether the effects are produced in an initial Stage of Achievement or a Stage of Satisfaction prior to experiencing a Phase of Reality, or from a Stage of Attainment or a Stage of Fulfillment, following a Phase of Reality. Where within research on self-efficacy, social cognitive theory has been prominent as a conceptual framework, the implicit role of social or environmental influences positions these research findings within a Phase of Externally Evoked Self-Assessment. In social cognitive theory, reference is made to 'self-reactive' and 'contextual' influences (i.e. preceding, and following Reality) (Bandura, 1991).

[2] In parallel to the previous note, it is unclear from the various research findings reported, whether the effects on performance stem from Stages within a Phase of Expectancies prior to experiencing a Phase of Reality, or from Stages within a Phase of Externally Evoked Self-Assessment following a Phase of Reality. Given the setting within the workplace from which the various research findings were reported, a choice for the latter was made.

[3] For general overviews of the last fifty years on so-called 'work motivation', reference is made to: Korman, Greenhaus & Badin (1977), Latham & Pinder (2005) and Grant & Shin (2012).

[4] In related studies, various researches have provided an identification of the various goals as defined by employees. Around the nineteen thirties Houser (1938) reported highest rankings for: (1) a fair adjustment of grievances, (2) steady employment, and (3) safety.
Since the first researches emerged in the late nineteen forties (Harrell, 1949), there appears to be a difference between the various hierarchical levels, as Hofstede (1979) reported: professionals stressed the importance of job content, whereas skilled workers and technicians valued job security and money; finally, unskilled workers stressed the importance of benefits and work conditions.
More recently research has stressed temporal changes in goal-definition in so-called 'research on generational differences', where representative samples of generations have been observed over time in longitudinal studies comparing respondents over time at a same age. As a principal outcome, extrinsic values were highest among respondents born around 1975, were high among respondents born around 1990, and were lowest among those born around 1960. Those born around 1990 appeared to place less importance on social and intrinsic work values than those born around 1960 (Twenge, Campbell, Hoffman & Lance, 2010).

In addition Latham, Locke & Fassina (2002) provided through research an explanation confirming the effects of Reality and a subsequent Phase of Externally Evoked Self-Assessment on assessments made in a renewed Phase of Expectancies. (...)" high goals lead to high performance, which in turn leads to rewards. Rewards result in high satisfaction as well as high self-efficacy regarding perceived ability to meet future challenges through the setting of even higher goals" (as summarized in Latham & Pinder, p. 497). As such they reconfirmed earlier findings made in the nineteen sixties by Lawler & Porter (1967) of sustained evidence that job performance affects (job) satisfaction, not the reverse. Thus, reaffirming the observations made in the Model of Motivation.

7. A Phase of Anticipated Change

Evidence of an intended change-oriented Phase of Externally Evoked Self-Assessment, has been indirectly provided by research on perceived causes, originating from studies in social learning and personal responsibility. If one reflects on the consequences of one's actions, influenced by input provided in a Phase of Reality, this provides an indication for an 'anticipating reflection on change' as postulated in Chapter 3.3.1.7.

In research on perceived cause of success, different reinforcement schedules were manipulated by telling subjects, through a Phase of Reality, the outcomes of a task were either obtained through personal skills, or by chance. The general outcomes demonstrated a considerable influence on expectancies of success when a successful relation with personal skills, rather than chance, was suggested (Phares, 1957; James & Rotter, 1958), thus providing evidence for a differential effect from a Phase of Reality, through a Phase of Anticipated Change on subsequent renewed perceptions in a Phase of Expectancies.

Similar findings were obtained on studies of perceived attractiveness. Again, differential effects occurred following interference from Reality, with decreased attractiveness following negative, and increased attractiveness following positive interference (Hammock & Brehm, 1966; Mazis, 1975).

In research on perceived locus of control, a same differential effect appeared from a Phase of Reality, where individuals that had high expectancies for personal control, i.e. had positive experiences following intervention from Reality, appeared to be more receptive for external input, than those low in generalized expectancies for personal control (Phares, 1976; Seeman, 1963; Seeman & Evans, 1962).

In addition, a pronounced loss of control on external interference has been demonstrated to have severe adverse effects on motivation and general well being (Hiroto & Seligman, 1975; Lefcourt, 1976; Seligman, 1975; Seligman & Maier, 1967). Significance of a perceived interfering Reality appears to regulate these effects (Roth & Kubal, 1975; Wortman & Brehm, 1975).

Closely related to research on perceived effects of external interference, are findings obtained from 'intrinsic' versus 'extrinsic motivation'. Initial interest in a task, defined as 'intrinsic motivation', was partly lost when an external reward, defined as 'extrinsic motivation', was provided for performing that task (Deci, 1975). Losing one's influence on external interference from Reality, reflected upon in a Phase of Anticipated Change, led to a re-attuning of parameters in a subsequent Phase of Expectancies that found expression in a substantial reduction in motivation, either experienced in expectancies of success or failure or expressed in behavior.

In these and previously mentioned findings, however, a clear distinction has been made in studies aimed at registering effects on motivation following exposure to Reality, and those aimed at evaluating effects of external control, as these studies are observed within the context of the Process of Interference, referred to in Mennes (2016, *in press*), notably Chapter 7, Chapter 10 and Chapter 13 [1].

8. A Phase of Dedication

Mechanisms that are assumed to be operational in a Phase of Dedication, as defined in Chapter 3.3.1.8., have been researched at length in a broad range of cognitive consistency studies, where cognitions were observed that were in disharmony, instigating processes to reestablish consonance (Zajonc, 1968).

Research was initiated by Festinger in the late nineteen fifties with the presentation of a theory of cognitive dissonance (Festinger, 1957). Evidence that mechanisms modify cognitions produced by a discrepant Reality have been reported by many (Aronson & Carlsmith, 1963; Aronson & Mills, 1959; Fazio, Zanna & Cooper, 1977; Festinger & Carlsmith, 1959; Harmon-Jones, Brehm, Greenberg, Simon & Nelson, 1996), with studies extending dissonance even to deprivation (Brehm, 1962).

Negative perceptions of the self appeared to moderate these outcomes. In self-consistency theory research on dissonance, people with negative expectancies (Aronson & Carlsmith, 1963), low-self-esteem (Glass, 1964; Maracek & Mettee, 1972), or even mild-depression (Rhodewalt & Agustsdottir, 1986), appeared to experience less dissonance when their behavior was discrepant with socially acceptable standards, providing indirect evidence for effects of assumed Mechanisms of Representation, following a confrontation with Reality, and Coping, in subsequent Phases in the Model of Motivation, as postulated in Chapter 3.3.2.2., Chapter 3.3.2.3. and Chapter 3.3.2.4. Moreover, people with high self-esteem were found to provide equivalent patterns, with prevalence to maintaining positive cognitions about one's self (Steele, Spencer & Lynch, 1993).

[1] Deci (1975) makes a distinction between a 'controlling aspect' according to this study, which appears related to a Process of Interference, and an 'informational aspect', which would refer to a Process of Motivation. For an extensive overview of self-determination theory: Ryan & Deci, 2000.

Finally, research into the various expressions resulting from Mechanisms of Representation in a renewed cycle within the Model of Motivation, especially on a Constituent, referred to as Consolidation in Chapter 3.3.5., has been performed by Weiner, Russel & Lerman (1978), in terms of experienced satisfaction and frustration, supporting assumed observations especially on outcomes in a Phase of Internally Evoked Self-Assessment.

4.5.2. Conflicting Evidence

An overview of results from literature with conflicting evidence appears to provide surprisingly little indications for divergent outcomes to assumptions made in the Model of Motivation. It goes without saying that within the various theoretical approaches divergence in rationale for findings has occurred on many occasions. Examples include controversies between reinforcement and cognitive theories (Rotter, 1954), theories emphasizing situational versus intrapersonal determinants of behavior (Bandura & Walters, 1963), controversies between dissonance and reinforcement theorists (Wicklund & Brehm, 1976), or consistency theories (Cialdini, Trost & Newsom, 1995; Korman, 1974; Pepitone, 1966; Singer, 1966), to name but a few. But these controversies occurred on the interpretation of findings, not on divergent results.

Nonetheless, a number of contradictory results emerged.

From studies on aggression the evidence appeared to be inconclusive in defining whether Reality instigates aggression, or aggressive behavior is enhanced by Reality, as the Model of Motivation suggests.

In dissonance studies, researchers obtained evidence that could contradict the dissonance properties assumed in the Model of Motivation, notably in Mechanisms of Representation, Chapter 3.3.2.2., Chapter 3.3.2.3. and Chapter 3.3.2.4., in support of constructs derived from self-perception theory (Bem, 1967, 1970). These findings could indicate that reducing balance or restoring dissonance not always seemed to occur (Bator & Cialdini, 2006; Cialdini, Trost & Newsom, 1995). In this respect, it also appeared that cultural differences could play an additional role in these observations (Heine,& Lehman, 1997; Kashima, Siegel, Tanaka & Kashima, 1992). An assumed mediating effect of Significance of Reality according to the Model of Motivation, has not been researched in these findings.

Finally, recent research produced new insights on unconscious goal pursuit (Bargh, 2006; Bargh, Gollwitzer, Lee Chai, Barndollar & Trötschel, 2001; Custers & Aarts, 2010). "According to the concept of unconscious goal pursuit (...) the direction and motivation of people's thinking and doing can start and proceed outside of conscious awareness, because one can directly rely on accessible goal-relevant representations that are primed by contextual as well as behavioral information (...). When activating or priming a goal (...), we do not access a single concept, but rather a rich structure containing, (...) cognitive, affective behavioral information" (Aarts & Custers, 2012, p. 234). These findings call for a further conceptualization of the Goal construct.

4.5.3. Supplemental Findings

An overview of results obtained from literature that could provide additions to the Model of Motivation, have been referred to earlier in an analysis of theories, Chapter 4.4.

Empirical research produced evidence for supplemental findings obtained from three theories.

1. Lewin's Field Theory

Lewin's field theory provided an interesting addition to the proposed Model of Motivation (Lewin, 1935, 1936, 1938). The concept of tension between inner-personal regions, and the extent of permeability of boundaries of those regions creating increase or decrease in tension, provided a dynamic construct for pluriform desires, or multiple Models of Motivation, and their mutual influences. In the present representation of the Model of Motivation these different cycles are assumed to exist independently from each other. The concept of regions and adjacent permeabilities could enrich the present static description. Research in the nineteen thirties and forties produced a considerable number of empirical findings to support these observations, although the evidence was produced through indirect operationalization of key concepts (most prominent are: Festinger 1942A; Lewin, Dembo, Festinger & Sears, 1944; Sears, 1942, Zeigarnik, 1927. see overviews in Weiner, 1966, 1980b).

2. Atkinson & Birch's Dynamics of Action Theory

In addition to the concept of adjacent regions, Atkinson & Birch (1970) proposed a dynamics of action theory providing a series of mathematical equations aimed at capturing and predicting change from one activity to another. The strength of motivation, or tendency T was observed for different activities over time, where a single tendency was assumed to predominate. For two activities, the strength of tendencies could be expressed in five patterns of changes over time. The theory provided an addition to the Model of Motivation, especially where it assumed a phenotypical similarity in the expression of differing Models of Motivation, where underlying motivational dynamics could be dissimilar with differential implications for subsequent actions.

3. Goal Systems Theory

A third additional insight was provided by Shah & Kruglanski. (2000) in their goal systems theory. The theory provided an addition to the Model of Motivation by observing the effects of associatively related goals. As stated: "(...) goal commitment may depend not only on the motivational contents of the goal itself,

but also on the goal's interconnections within alternative entities within an individuals' goal-system. Goal commitment (...) may be negatively affected by the goal's association with alternative, unrelated, goals whose activation may serve to undermine commitment to the goal in question" (Shah, Kruglanski, Friedman, Spencer, Fein & Zanna, 2003, p. 258; see also: Shah, Friedman & Kruglanski, 2002). Thus, the theory provided an additional perspective for a further elaboration of the Model of Motivation, observing pluriform expressions of various interacting Models and their respective Goals.

More recently, two additional insights to goal-interconnection have been addressed by Carver & Scheier (2012): the issue of goal-priority and goal-conflict. "People typically have many goals under pursuit simultaneously, but only one has top priority at a given moment" (Carver & Scheier, 2012, p. 36). Moreover, mechanisms involved in goal-conflict were observed: "the idea that conflict exists between longer term and shorter term goals is also part of a literature on self-control failure (e.g., Baumeister, Heatherton & Tice, 1994). This literature focuses on cases in which a person is both motivated to act and motivated to restrain that action" (Carver & Scheier, 2012, p. 38). These ideas provide further thoughts for an elaboration of the Model of Motivation, extending on the hierarchical order in goal-pursuit, or outcomes of interconnected goal-conflict.

4.5.4. *Conclusions*

An embedment of the Model of Motivation in current findings as obtained from empirical research was aimed at observing similarities and dissimilarities Following the rationale on embedment in the exposé from Chapter 1.5., an emphasis was placed on research following a hypothetico-deductive approach.

In the conclusions formulated Chapter 4.4.1., empirical research was expected to produce an extensive range of findings over a large array of topics. Much in line with these expectations, empirical research provided many congruent findings with assumptions made in the Model of Motivation, supporting directly or indirectly the various Phases and constituting Stages from the Model.

Although controversies were found to be addressed in many aspects of the field, these controversies were targeted at interpretations of findings. Empirical research contradicting the assumptions underlying the Model of Motivation have been reported on only a few occasions.

As reported earlier, supplemental findings emerged from research associated to three theories of motivation.

As a general conclusion from the analysis of empirical research, it was found the inductive inference leading to the assumptions made in the Model of Motivation, appeared to be supported by a majority of research findings.

4.6. Observations

Following the analysis of the literature that appeared to provide an embedment of the Model of Motivation within current theory and research, a number of evaluative observations can be made.

In accord with the methodology, proposed in Chapter 4.2., which structured the analysis, a partition is made in observations on theories of motivation and observations on empirical research. A number of observations, however, can be applied to both approaches. A dichotomy is maintained, with topics emphasized in observations on either theory or research, to avoid duplication in coverage.

4.6.1. Observations on Theories of Motivation

Following an overview of nearly a hundred theories of human motivation, a first, theory-related observation characterizes a current state of affairs: *there is no consensus on a definition of motivation.* In an attempt to capture a common denominator, theorists appear to have been guided by a single question: "why do organisms behave as they do?" (Weiner, 1980b, p. 6.). The broad scope, however, of this definition has had profound repercussions on the development of theories of human motivation. A number of observations are made, that refer first to the definition of motivation, second to the various concepts used within the context of the definition, and third to the forms of representation in which the various theories have made use of these concepts.

1. Observations on Definitions

Within the context of the definitions used in the present study, a vast majority of definitions in current literature appear to include both the Process of Motivation and the Process of Interference, thus making no distinction between mechanisms that are manifest within the Individual, and procedures or techniques that are aimed at addressing these mechanisms and that are initiated externally by an Actor-Intervener. An example is the definition provided by Petri & Govern (2013): "Motivation is the concept we use when we describe the forces acting on or within an organism to initiate and direct behavior" (p. 4)[1] [2]

[1] In an overview provided by Kleinginna & Kleinginna in 1981, from 102 definitions, only 7 made an explicit distinction in 'internal' (i.e. a Process of Motivation) and 'external' influences (i.e. a Process of Interference).

[2] In Table 4.1. the distinction is applied in all observed theories by referring to Conditions, Competencies and Instruments, with reference to notes (6), (7) and (8).

In conjunction with these observations, there appear to be very few theories that explicitly take into account the Perspective from which the theoretical construct is defined or approached, as elaborated on in Chapter 3.2. and Appendix I, Section A.1.2. Only attributional theories appear to provide such distinctions (Jones & Nisbett, 1972, Monson & Snyder, 1977; Weiner, 1980b).

Although the inherent incongruency between both Processes has been addressed in the overview of the literature in the current Chapter by applying a clear differentiation and considering only theories and empirical research with reference to the Process of Motivation, it appears to have created a profound confusion in current literature, both in theory construction and in the interpretation of results produced in empirical research. Further reference is made to the analyses in Mennes (2016, *in* press), notably Chapter 7, Chapter 10, and Chapter 13.

2. Observations on Concepts

The insufficiencies in the definition of motivation have led to confusion in related psychological constructs.

A conceptual confusion appears to have occurred in literature in two manifestations:

- *Divergent Conceptual Confusion:* Different theorists appear to have used different names, or designations, for the same constructs, notions, or ideas.

  As stated by Weiner, concepts of drives and needs have been used interchangeably: "For example, Hull considered drive the psychological manifestation of a need state. Over time, however, drives became identified with states of deprivation, behaviorism, and research employing infrahuman organisms, while the concept of need became identified with molar personality theorists and signified more stable characteristics of individuals" (Weiner, 1980b, p. 180). Furthermore Divergent Conceptual Confusion was found in concepts as reinforcement and incentive motivation that indicate a same phenomenon (Bindra, 1969), or employee morale and satisfaction (Guion, 1958; Stagner, 1958).

  As a consequence, theorists suggested introducing similar names for truly differing constructs, as assumed in the Model. Following the localization of the Reticular Activating System (RAS) within the brain (Moruzzi & Magoun, 1949), and its relation to arousal, activation theorists argued that emotion and motivation were equivalent, sharing a common neurological origin (Hebb, 1955; Lindlsey, 1950, 1951). With divergence in definitions, motivation and emotion continue to be perceived by some theorists as equivalent (Bindra, 1974; Kalat, 2001; Wilson, 2003).

  A deficiency in defining motivation, with Divergent Conceptual Confusion, appear to have had a profound impact on theorizing.

- *Convergent Conceptual Confusion:* Theorists appear to have used similar names, or designations, for different constructs, notions or ideas.

  An example of Convergent Conceptual Confusion has occurred within expectancy-value theories with the concept of incentive value. In Atkinson's theory of achievement motivation, the strength of tendency to achieve success at a particular activity T_S, was represented as: $T_S = M_S \times P_S \times I_S$. I_S (originally indicated as In_S) was defined as: 'the incentive value of success at a particular activity' (Atkinson & Birch, 1978, p. 94). Atkinson considered T_S to be a multiplication of a general disposition M_S or motive to achieve success, 'which the individual carries about with him from one situation to another' (*Ibid.,* p. 94) and two specific goal-related properties: $P_{S,,}$ or the 'expectancy (subjective probability) that the act will have as a consequence the attainment of an incentive' (Atkinson, 1957, p. 360), and I_S, or 'the value of the incentive' (Atkinson, 1957, p. 361), where incentive is equal to the concept of a Goal (see Atkinson, 1957, note 3, p. 363). In literature however, the incentive value of success has been referred to as a non-goal-related general disposition: 'pride in accomplishment'.

  Referring to the Model of Motivation, the designation I_S or value of the incentive, has been used in literature for different constructs: a specific goal-related property (the incentive, or value of the Goal 'X', defined as the Significance of Goal 'X' in the Model of Motivation) and a disposition (the incentive value to attain success, or Goal 'Y', in the process of attaining Goal 'X', defined as a separate Goal, with separate parameters in the Model of Motivation).

  This conceptual confusion ('Significance of a Goal 'X' ' versus 'obtaining feelings of pride following the attainment of Goal 'X' ', which is a different Goal in itself) has had profound consequences in application and understanding of expectancy-value theory and research. The shift in emphasis from Goal-related Significance towards effects on the subjective experience of success, could have led to divergent empirical outcomes, where research findings aimed solely at observing effects within Phases of Expectancies, Effort and Internally Evoked Self-Assessment, i.e. without observing effects from Reality or a Phase of Impact, have been confused with the vast majority of those obtained including all these five Phases.

3. Observations on Levels of Abstraction

A further observation on theories of motivation is a distinct variation in so-called 'Levels of Abstraction'. In defining goal-orientation, some theories specified the content or expression of a goal, whereas other theories restricted their description to abstract generalizations. In describing goal-orientation as an abstract concept, theoretizing occurs at a higher Level of Abstraction, than in describing the content or expression of one's goal. As a consequence of these differences on

Levels of Abstraction between theories not only Concept Confusion occurred, but resulting theories became diffuse in the concepts they used. In a strict sense, the one definition encompassed or (partly) contained the other. Reference is made to an overview in Mennes (2016, *in press*), notably Chapter 7.6.1.2.

4. Observations on Theoretical Representations

In the expression of theories of human motivation a number of observations can be made on theoretical representations that have been used:

- *An Uniformistic Representation of Motivation:* Most theories, especially stemming from a Freudian and Hullian background, appear to have used a uniformistic notion of need or goal-orientation: motivation was the expression of a single state, or 'pooled source'. In addressing the issue of motive generality, Weiner stated in 1980: "It is not known, for example, whether a person who strives for success in a particular occupation also exhibits achievement-type behaviors on the tennis court, in his night school literature class, or in other such situations" (Weiner, 1980b, p. 188), and referred to only one study, at the time, examining the issue (i.e. Rosenstein, 1952). Only two theories seemed to have addressed a pluriformistic goal-orientation. Lewin's field theory appeared to express a pluralistic conception of needs, where motivation was the expression of distinct and multiple sources, or 'regions', where each region was associated with a particular goal object or class of objects (Lewin 1936, 1938). Atkinson & Birch, indirectly reiterated Weiner's observation, declaring in 1970 that the main problem for motivational theorists was to expand theoretical thought "...to explain and to predict the change from one activity to another, rather than the change from activity to rest or from rest to activity" (as expressed by Weiner, 1980b, p. 209).

  The uniformistic conception that motivation is the expression of a single state, has possibly led to a prominent discussion, referred to as: the 'trait-situation controversy', where behavior is either perceived as consistent in differing situational settings (trait), or perceived as different and dependent on each situational setting[1].

  In the Model of Motivation a pluriformistic approach is used, where Motivation is assumed to be an expression of a multitude of differing Models of Motivation, each defined by its own Goal, in reciprocal interaction.

[1] Controversy might have risen from two differing conceptions. When motivation and behavior are being perceived as synonymous concepts, an uniformistic conception of motivation (which 'traitists' do) suggests an uniformistic expression of behavior (which 'traitists' don't). Moreover, a difference in Levels of Abstraction, as covered in Chapter 4.6.1.3., might have contributed to the controversy. Where 'traits'-theorists aimed at describing mechanisms, 'situational'-theorists meant to describe the expression of these mechanisms. (See also: Alker, 1972; Allport, 1966; Bowers, 1973; Mischel, 1968, 1973, 1976).

- *An Uni-dimensional Representation of Motivation:* Most theories appear to have had a single approach in the expression of its constituent theoretical constructs.

The profound influence of behaviorism and its philosophy of positivism, a philosophy that only directly observable knowledge is valid (Watson, 1913, 1925; Watson & McDougall, 1928), appear to have determined subsequent theorizing. Behaviorists "(...) imposed a strict cause and effect determinism in behavior. For them, human choice, or 'free will' (was) an illusion" (Latham, 2007, p. 9). This cause and effect perception, starting from a stimulus-response connection, persisted in theoretical conceptualization through reinforcement to habit-formation, incentive, evolving into primitive arousal, towards cognitive intention, and exploration. This theoretical conceptualization further progressed in conceptions of valence, expectation and attribution.

Fig. 4.1. depicts over sixty years of theorizing on the concept of motivation, where repetition of the conceptual 's-r connection' persisted and remained as a principal 'cause-effect' expression in almost all theories on human motivation, extending from the early nineteen thirties to the end of the nineteen nineties.

This reoccurring conceptual Uni-dimensional Representation, could have affected originality, eventually causing a stagnant field of study (Reeve, 2005), and leading to a call for new groundbreaking papers by *the Academy of Management Review,* recognizing the limitations of theory and research in the field of (work) motivation (Steers, 2001).

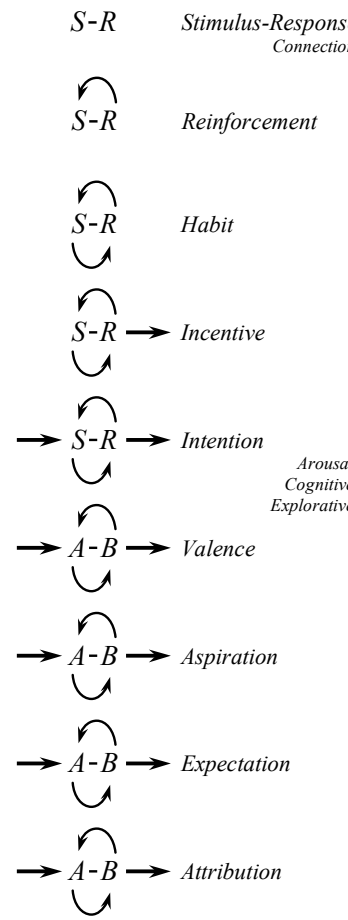


Fig. 4.1.
A Uni-Dimensional Representation in Traditional Motivation Theories.

- *A Static Representation of Motivation:* Finally, a tendency appeared to exist in current theories to represent motivation as a static phenomenon. The temporal aspect op processes evolving over time has been underrated (Donovan, 2001; Kanfer, 1990; Steel & König, 2006). Motivation appeared to be represented as a 'snapshot' instead of a 'video' articulating its dynamic properties.

4.6.2. Observations on Empirical Research

In observing empirical research in the field of human motivation, two final observations emerge: on operationalization and on methodology.

1. Observations on Operationalization
Measuring Motivation

Empirical research, in following a traditional hypothetico-deductive approach, demonstrated strong similarities on the operationalization of motivation. Characteristic for research appeared to be an emphasis on behavior. The roots of motivational theories stem predominantly from the Anglo-Saxon world, with its traditional emphasis on observable behavior. However, different authors have expressed caution for the leading role of overt behavior in operationalization of motivation (e.g. Petri & Govern, 2013). In addition, subjective measures, like the Thematic Apperception Test in achievement motivation research have been prominent despite controversies (Entwistle, 1972; Klinger, 1966), in strong contrast to a meticulous adherence to strict research designs.

As stated earlier, in Chapter 3.3.3., especially subjective measurements capturing the concept of Motivation, are expected to affect validity as a result of various Mechanisms of Anticipation and Representation.

As a final observation on operationalization, the traditional approach to measuring motivation appears to have resulted in a minimalist expression of motivation, severely limiting its complex and pluriform manifestation.

2. Observations on Methodology

The analysis aimed at observing empirical research produced within a robust hypothetico-deductive tradition.

According to Weiner (1980b), the approach in literature has been characterized by two stratagems: one stratagem (the 'experimental stratagem') is a product of academic, experimental procedures, identifying determinants of behavior and then specify (mathematically) the relations between these variables, while the other (the 'clinical stratagem') is an outgrowth of clinical, non-experimental procedures aimed

at producing basic principles of behavior that provide insights in its causes without being subject to definitive proof or disproof [1].

The traditional methodology as observed within the 'experimental stratagem' has produced a wealth of (replicable) empirical findings. However, the approach inherently contains a severe threat of oversimplification depending heavily on validation of minimalized hypotheses. As elaborated on initially in Chapter 1.5., the emphasis on hypothesis-validation appears to have initiated a decline in traditional inductively inferred Models from which a wealth of hypotheses could have been derived.

In short, the approach has led to an oversimplification of the complex and intricate phenomenon of motivation.

Conversely, the large array of findings from this traditional approach in empirical research has enabled an embedment, and thus an indirect validation, of the elements, Mechanisms and conceptualizations presented in the Model of Motivation.

4.6.3. *Conclusions*

Following an analysis of the literature that appeared to provide an embedment of the Model of Motivation within a current body of knowledge, a number of evaluative observations were made, aimed both at theory and research.

In an overall and initiating observation, there appears to be no consensus on a definition of motivation. The diversification made in a Process of Motivation distinct from a Process of Interference, has not been made in literature.

It appears repercussions have been many.

In theories of motivation, a number of observations were made on Conceptual Confusion, Levels of Abstraction and Theoretical Representations. Divergent Conceptual Confusion was observed, where different theorists appeared to have used different names, or designations, for same constructs, notions, or ideas. Convergent Conceptual Confusion, where theorists used similar names, or designations, for different constructs, notions or ideas, appeared less prominent but induced profound misinterpretation. In defining concepts, some theories specified content, whereas other theories restricted descriptions to abstract generalizations, causing ambiguous theoretical constructs defined at differing Levels of Abstraction. In Theoretical Representations, the body of literature on theories of human motivation appeared to be Uniformistic, where motivation

[1] Later, Weiner re-defined these stratagems to a 'machine metaphor' versus a two-fold 'godlike metaphor', expanding the 'clinical stratagem' to an understanding of motivation suggesting that people behave rationally and purposefully (Weiner, 1991).

was the expression of a single state without diversification in differing expressions of various motivational states; Uni-dimensional, with a strong replicative tendency in simple cause-and-effect constructions; and Static, with non-dynamic representations of motivational processes. The origin of this observed tendency appears to be in a strong tradition of 'replicative' elaborations, with one theory progressing on the other, or rather, on its derived empirical findings.

In observations on empirical research, a same tendency appeared, with an emphasis on limited operationalizations of motivation. Combined with a strong tradition of hypothetico-deductive research designs, the approach appeared to have produced a robust body of empirically validated data, at the expense, however, of a limited, or 'atomistic' approach of the complex and intricate phenomenon of motivation.

Although the analysis of the literature on motivation thus appeared to be 'replicative' and 'atomistic', it produced a body of knowledge that provided a robust embedment for the inferences that have led to the formulation of the Model of Motivation.

4.7. Summary

The theoretical Model of Motivation obtained largely through a process of inductive inference in Chapter 3, was reflected on through an analysis of current literature. Elements from the Model were connected to findings from literature, both in theory and through empirical research. Thus, an embedment was made between the observations made through an inductive inference and an existing body of knowledge, as proposed in Chapter 1.5.

A first analysis of current theories of human motivation[1] aimed at observing similarities and dissimilarities between the Model of Motivation and those proposed in current literature. A vast majority of theories appeared to be covered by the Model, thus providing an indication of embedment in traditional approaches to motivation. Most theories appeared to highlight distinct Phases within the Model, with only few theories displaying an extensive coverage of all suggested Phases.

From a first analysis, it appeared no theories were to be found that provided a conflicting approach to the Model, although some findings suggested a further conceptualization of the Goal-construct.

[1] In the description of theories the convention was followed, introduced in Chapter 2.2., to have a notation using capital letters, referring to the Model of Motivation and its related Phases and Stages, as presented in Chapter 3, to discriminate these constructs from those used in literature. Thus, all concepts in literature were referred to in small letters to provide a contrast to those used in the study.

Three theories provided supplemental elements to extend the Model of Motivation towards covering multiple Goals in observing dynamics of interlinked Goals and Goal-preferences.

An embedment of the Model of Motivation in current findings obtained from empirical research was to aim, likewise, at observing similarities and dissimilarities in connection to the body of knowledge obtained from a mainly deductive approach. An emphasis was placed on research following a hypothetico-deductive approach, based on the rationale proposed in Chapter 1.5.

The analysis was to provide overviews of supportive, conflicting and supplemental evidence.

Much in line with expectations formulated Chapter 4.4.1., that empirical research was likely to produce an extensive range of findings over a large array of topics, the vast amount obtained from literature provided many congruent findings with assumptions made in the Model of Motivation, supporting directly or indirectly the various Phases and constituting Stages and assumed Mechanisms within the Model.

Although controversies were found to be addressed in many aspects of the field, these controversies were assumed targeting interpretations of findings. Empirical research contradicting the assumptions underlying the Model of Motivation, have been reported on only a few occasions.

Supplemental findings emerged from research associated to three theories of Motivation.

Following an analysis of the literature, a number of evaluative observations were made, aimed both at theory and research.

In an overall and elementary observation, it appeared that in current literature no diversification has been made in a Process of Motivation distinct from a Process of Interference, thus in mechanisms that are manifest within the Individual, versus procedures or techniques aimed at Management of Motivation by an Actor-Intervener.

It appears that repercussions from this observation have been many.

In theories of motivation, three main observations were made:

- *Conceptual Confusion appeared to have occurred, in two manifestations:*
  - *Divergent Conceptual Confusion was observed, where different theorists appeared to have used different names, or designations, for same constructs, notions, or ideas;*
  - *Convergent Conceptual Confusion was found, where theorists used similar names, or designations, for different constructs, notions or ideas.*
- *Levels of Abstraction: In defining concepts, some theories specified content, whereas other theories restricted descriptions to abstract generalizations, causing ambiguous theoretical constructs defined at differing Levels of Abstraction.*

- *Theoretical Representations were made, as expressed in three manifestations:*
  - *An Uniformistic Representation of Motivation: where motivation was the expression of a single state without diversification in differing expressions of various motivational states;*
  - *An Uni-dimensional Representation of Motivation: with a strong replicative tendency in simple cause-and-effect constructions;*
  - *A Static Representation of Motivation: with non-dynamic representations of motivational processes. The origin of this observed tendency appeared to be in a strong tradition of 'replicative' elaborations, with one theory progressing on the other.*

In sum, theories of motivation appeared to have had a strong 'replicative' tendency.

In observations on empirical research, a tendency appeared, with an emphasis on limited operationalizations of motivation. Combined with a strong tradition of hypothetico-deductive research designs, the approach appeared to have produced a robust body of empirically validated data, at the expense, however, of a limited, or 'atomistic' approach of the complex and intricate phenomenon of motivation.

Although the analysis of the literature on motivation thus appeared to have been 'replicative' and 'atomistic', it produced a body of knowledge that provided a robust embedment for the inferences that have led to the formulation of the Model of Motivation.

As a general conclusion, then, from the analysis of theories and empirical research produced in literature on human motivation, it was concluded that the inductive inference leading to the assumptions made in the Model of Motivation, appeared to have been supported by a majority of theories and research findings.

In a final observation, from a slightly different perspective, it appeared that in the attempt at coverage and embedment, the Model of Motivation provided a comprehensive conceptual framework for classification of current theories on human motivation.

Chapter 5
Empirical Research
The Process of Motivation

5.1. Introduction

A Model of Motivation was introduced that appeared to be embedded in a large array of theories and empirical findings produced in literature.

In the Model presented, it was assumed that every Process of Motivation evolves around an objective and proceeds in a number of distinct, consecutive steps or so-called 'Stages' that can be organized in groups or 'Phases'. The Process of Motivation was an intentional, oriented activity aimed at reaching and fulfilling the objective set. Human Motivation, in short, was perceived of as an 'inner dialogue', a stepwise, sequential Process, where the Individual attempts to reach and secure the objective, seeking a balance within the constraints of his mental or physical surroundings.

Chapter 5, is to provide descriptive evidence of assumed essentials within this Process of Motivation.

The objective of the Chapter was summarized in the Problem Statement, Chapter 2.5.:

- *This dissertation aims, as its primary objective, at providing insights into the Process of Motivation, by means of:*
    - *a theoretical Model, provided in a summarized overview Chapter 3,*
    - *an embedment in current literature, provided by an annotated overview of principal findings in Chapter 4,*
    - *with the present Chapter to contain empirical research providing evidence of the elementary constructs from the Model, in terms of components and their respective items, capturing the Process of Motivation,*

      thus providing empirical evidence in support of the Model.

5.2. Application of the Model of Motivation

At the basis of an empirical validation in Chapter 5, are the Pre-Fundamental Assumptions defined Chapter 1.5., where a reintroduction of inductive inference in the generation of theoretical Models is suggested. A demarcation between theory-formation and definition of hypotheses is to differentiate inductive generalizations from empirically tested deductive findings.

Essential in the Model is that it provides an explanatory context from which elementary hypotheses, critical to the Model, can be derived. In concluding the overview, Chapter 3.3.4. identified Phases of Internally Evoked Self-Assessment and Dedication, as Phases essential to the Model of Motivation. Both constructs, then, are to be elementary in the formulation of those hypotheses.

The empirical research, in its essence, is to either verify if both Phases can be identified as elementary in a data-set, or aim at a statistical reduction of a data-set leading to an identification of both Phases. A choice for data-reduction is made. The approach is reflected in a definition of hypotheses provided in Chapter 5.4.3.

To perform the data-reduction a quantification of the Model of Motivation and its distinct elements is made.

A brief overview of the operationalization precedes a description of the research design.

5.3. Operationalization

Given the theoretical Model of Motivation provided in Chapter 3, an operationalization of distinct elements from the Model is obtained by means of a questionnaire, capturing each Stage with a number of questions, clustered according to their distinct Phases, thus covering all aspects of the Model.

A specifically designed questionnaire is introduced, the 'Human Factor Inventory', designated as 'HF-2.01' [1].

In presenting the HF-2.01 questionnaire it is to be emphasized, however, that in this dissertation the objective has been to capture distinct elements from the Model, not to design a measurement instrument[2] [3].

[1] In the naming of the questionnaire the term 'Motivation' was left out intentionally and a neutral designation 'Human Factor Inventory' was used to avoid a potential bias amongst respondents filling out the survey.

[2] As referred to in the Preamble the focus of this dissertation is mainly theoretical and aimed at a verification of an assumed conceptualization of the Process of Motivation. However, the research Project, referred to in Mennes (2016, *in press*) on which this dissertation is based, has a more practical focus, capturing elements within Motivation to quantify and test the effects of managerial techniques in addressing Motivation. From this perspective, the approach aimed at quantification in the research Project could be perceived of as a first step towards a design of a measurement instrument.

[3] In addition to these observations on design of a measurement instrument, further steps are to focus on the assessment of various psychometric characteristics, in terms of reliability and validity. A number of preliminary observations have been made in Mennes (2016, *in press*), notably Chapter (Continued)

The questionnaire covers a total of 93 questions, with a set of additional descriptive questions aimed at specific sampling populations. For a full overview, reference is made to Appendix III, where the questionnaire is presented both in its original version in Section A., and with distinct items clustered according to the 8 respective Phases of the Model, in Section B, with letter-coded indications, and the Likert-scales used per item. For reasons of brevity, items contained in Section B. are presented in a condensed phrasing, and explanatory texts included in the original questionnaire have been omitted.

A background rationale for the clustering of items is included in Appendix III, Section B. For an overview on the format of the questionnaire and on phrasing and scaling of questions, reference is made to Mennes (2016, *in press*), notably Chapter 5.3.

5.4. Research Design

The HF-2.01 questionnaire operationalizes the various Phases of the Model of Motivation and provides a quantified data-set. Given the Problem Statement, the empirical research is aimed at tracing within this data-set, the elementary components that capture the concept of Motivation, while preserving, as much as possible, its original signature.

The design of experiment, then, is aimed at a reduction of the data-set to a series of components and to provide evidence of a match between those components and items captured according to the Phases of the Model.

Two approaches are considered: Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). Although CFA appears to be an appropriate statistical technique to verify the factor structure of a set of observed variables (Suhr, 2006), and a comparison is made between a set of statistically derived elementary components and a set of theoretically inferred items, a preference is given to EFA. Given the Problem Statement of the dissertation to obtain elementary constructs that capture the Process of Motivation, EFA is used, rather than CFA, as the principal aim of the analysis is to explore the possible underlying structures in a set of interrelated variables without imposing any preconceived structure on the outcome (Child, 1990). Instead of postulating a relationship pattern a priori between a set of variables and underlying constructs, and testing the hypothesis that a relationship exists, as occurs in CFA (Suhr, 2006), EFA merely identifies constructs and underlying factor structures in data-sets (Stevens, 2002). Where EFA explores, CFA determines the adequacy of a model fit (Schumacker & Lomax,

14.4.2., where internal, external, construct and statistical conclusion validity issues were observed. Additional research is needed, not only to further analyze these validity issues, but also to provide comparisons with current standards in both predictive and concurrent validity analyses, or by using multiple methods, in terms of currently available surveys that are assumed to measure same entities, and to elaborate on construct validity in Multitrait-Multimethod Matrix (MTMM) analyses (Campbell & Fiske, 1959; Fiske & Campbell, 1992).

1996; Suhr, 2006; Tabachnik & Fidell, 2001)[1] [2].

Data reduction is obtained through Principal Component Analysis. In the extraction phase of the analysis, the data-set of questions obtained from the HF-2.01 questionnaire is limited to components with highest eigenvalues, designated as 'initial components', accounting for a substantial variance and thus providing an adequate description of the data-set. In a subsequent rotation phase these extracted initial components are further reduced towards components that are optimized in structure and therefore, can be considered as a reduced reflection of the original initial components. These resulting components are designated as 'elementary components', which, through rotation, have preserved their original signature.

In a subsequent step, the reduced data-set is to be compared to the Model of Motivation it is meant to represent. Two important assumptions underlie the comparison.

It is assumed, that if the resulting elementary components are an adequate representation of the Model of Motivation, these clusters will reflect the structure in alleged Phases the Model consists of. Given the Problem Statement, as defined in Chapter 2.5., a statistical reduction is to provide components that are to reflect clusters of items operationalizing elementary constructs, or the most important Phases in the Model of Motivation.

Additional comparisons are made to verify these findings, which are based on a second important assumption. The Model of Motivation claims to be universally applicable: the sequential Model capturing the Process is assumed to be the same irrespective of differences in sampling population. Thus, with a business environment as a principle sampling population as indicated in Chapter 2.4.3.3., it is assumed the Model of Motivation would provide a same set of elementary components irrespective of differences in performance, or culture, or specific company-related characteristics, within limitations set to sampling within a quasi-experimental setting[3].

If clustering is to follow the suggested theoretical classification, it is assumed justified to perform a further statistical reduction that will greatly facilitate subsequent empirical research, i.e. the reduction towards a factor score per component.

[1] Furthermore, a choice for EFA also originates from a concern briefly covered in Appendix III, Section B. In the scale development generating the initial sets of items based on the theoretical Model of Motivation the assessment of content validity was challenged. By choosing EFA an additional verification could be obtained in observing resulting clusters from the data, without pre-imposing a set of theoretically inferred items, as in CFA. For further details, reference is made to Appendix III, Section B. For an excellent coverage on the development of measures see: Hinkin, 1995, 1998; MacKenzie, Podsakoff & Podsakoff, 2011.

[2] In addition, it is noted that the number of items to be analyzed is too large to use in a CFA (Bentler & Chou, 1987).

[3] For this reason, no further analysis of culture-related characteristics is performed.

5.4.1. Statistics

In the underlying statistical analysis, then, a three-fold approach will be followed:

- A reduction in data through Exploratory Factor Analysis by means of Principal Component Analysis;
- A comparison between statistical and theoretical data matrices;
- A reduction of data to a single statistical score, by means of factor scoring.

1. Exploratory Factor Analysis

Where the objective of the study is to determine elementary underlying structures without imposing a preconceived structure on the outcome (Child, 1990), in reducing the data-set a preference is given to EFA, rather than CFA.

Reduction of the data-set is achieved by Principal Component Analysis (PCA) (Dunteman, 1989; Stevens, 2002). The PCA approach assumes the sample to be the population, thus restricting extrapolation. Generalizations can be achieved by using different samples[1].

The PCA is performed on the correlation matrix of the data-set, which makes use of a standardized approach, thus avoiding the effects of differences in measurement scales on the variables (Morrison, 1967). A number of preliminary analyses are to precede the PCA. Inter-item correlations are to be observed with no items exceeding scores of .80, indicating that no singularity in data is present, and no items occur with a majority ($\geq$ 50%) of significance values exceeding .05 (Field, 2005). In addition, a Bartlett's Test of Spherity with $p<.001$ is to exclude that variables in the correlation matrix are uncorrelated, making a PCA redundant (Cooley & Lohnes, 1971). A Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) is to be performed with scores exceeding .7 (Kaiser, 1974; Hutcheson & Sofroniou, 1999).

Relevant, initial components are generated in three steps. First, components are isolated using a standard eigenvalue cutoff of 1.0 following Kaiser's criterion (Kaiser, 1960). Second, by graphing the eigenvalues in a scree plot and selecting the number of relevant components at the inflexion of the curve (Cattell, 1966; Child, 1990, Stevens, 2002). In addition to these common criteria, a third criterion is formulated by assuming an adequate extraction is performed when an average communality is obtained of at least .60, with a sample size exceeding n=250 (Hakstian, Rogers & Cattell, 1982; Stevens, 2002).

[1] As the assumption is made that the questions operationalizing Motivation, represent the entire Process, and thus that the variables generated in the different samples constitute the entire population of variables, a Maximum-Likelihood approach could also be used (Harman, 1976). Both approaches have a tendency to generate equal results (Guadagnoli & Velicer, 1988; Stevens, 2002), and preference was given to the more commonly used PCA approach.

In a subsequent rotation, components are extracted into clusters of variables using oblique rotation, with direct oblimin, as resulting components are assumed to be correlated to some extent, given the nature of the concept of Motivation with expected high degrees of communalities (Nunnally & Bernstein, 1994). The elementary components, called for in the Problem Statement, are isolated in three steps. First, as rotation can be seen as a further reduction of initial components towards an essential underlying dimension that was previously hidden before rotation, one could consider the rotation to be a reduction of these initial components towards ingredients that represent their essential nature. Thus, initial components are reduced to elementary components revealing their underlying original signature[1]. By observing in the analysis only these initial components, the rotation is to provide the essential dimensions within these initial components. In a first step, the analysis will therefore only focus on initial components and the reductions obtained after rotation. In a second step, per component, constituting items are isolated by interpreting only factor loadings with an absolute value greater than .40 (Stevens, 1992; with additional observations Stevens, 2002)[2]. In a third and last step, an overall reliability per component is determined, with a Cronbach alpha of at least .70 (Kline, 1999)[3].

A pattern matrix is preferred to represent the outcomes to those provided by a structure matrix, given the assumed relation in components and the extraction by oblique rotation (Graham, Guthrie & Thompson, 2003), as resulting values tend to be less inflated (Tabachnik & Fidell, 1996).

All analyses are made using standard SPSS procedures (Norusis, 1990).

[1] In the analysis, the elementary components are to be further reduced to two sets of elementary components, a primary and a secondary set.

[2] In addition, various rules have been suggested for including sample size as a criterion in obtaining reliable factors. Guadagnoli and Velicer (1988) suggest, in addition to the factor loading criterion, that components with about 10 .40 factor loadings are reliable as long as sample size is greater than about 150. The observations are to be included in determining an adequate sample size in Chapter 5.4.2.

[3] In addition to these criteria, a fourth criterion could have assumed these elementary components to account for a minimal proportion of total variance. However, with direct oblimin rotation, components are assumed to be correlated to some extent. In using a nonorthogonal rotation, the rotated components share common variance. As a consequence, variance cannot be partitioned uniquely among components and a cumulative variance cannot be deduced for isolated components.

2. Comparative Analysis of Matrices

A comparative analysis is performed observing a 'fit'-'non-fit', or 'true'-'false' classification, between elementary components obtained from the PCA and a clustering of items according to the theoretical Model of Motivation.

In the comparison and evaluation of simple 2x2 matrices a problem arises in using a suitable test, as the important assumption of having expected frequencies higher than 5 (for chi-square) or even 1 (for loglinear analysis) cannot be met when a near perfect match is achieved between two sets of nominal data with a comparatively small set of matching items[1]. As a result, different measures are applied. A simple comparison in terms of relative percentages in overlap is complemented by so-called 'sensitivity' and 'specificity' indicators (Altman & Bland, 1994)[2]. Relative overlap should be $\geq$ 75%, with both sensitivity and specificity measures exceeding 75%. Both a Phi Coefficient (Φ) and a symmetric Lambda (Guttman's Coefficient of Predictability λ) are used to indicate both strength and significance in results obtained [3]. A match would be achieved with both Φ and λ significant at $p<.05$.

The proposed approach for data comparison will also be applied in a comparison of data obtained from various sub-samples, as defined in Chapter 5.4.2.

[1] In these instances, an expected frequency is dramatically reduced for a small 'true-true' cell, in comparison to a dramatically larger 'false-false' cell. The more perfect the match, the less applicable both tests become.

[2] Sensitivity is a statistical measure of how well a binary classification test correctly identifies a condition. In the Figure, sensitivity is represented by the equation: TP/(TP + FN). Specificity is a measure of how well a binary classification correctly identifies the negative cases: TN/(FP + TN).

	Accepted	*Rejected*
Positive	True Positive (TP)	False Positive (FP)
Negative	False Negative (FN)	True Negative (TN)

[3] Lambda is a statistical measure of association, which reflects the proportional reduction in error when values of a variable x are used to predict values of a variable y. The value of each statistic can range from 0 to 1 and indicates the proportional reduction in error in predicting the value of one variable based on the value of the other variable. A value of 1 means that one variable perfectly predicts the other (Jahn, 1951; Stouffer, 1950). A description of Φ can be found in Cramer, 1999; Agresti, 2002.

3. Factor Scoring;

If clustering is to follow the suggested theoretical classification, a further statistical reduction towards a factor score per component is to be performed that will greatly facilitate subsequent empirical research.

A single factor score is to represent the relevant components found[1]. In order to avoid the influences of differences in scales of measurement used on the items in the questionnaire, factor score coefficients are used rather than factor loadings as weights in the final equations (DiStefano, Zhu & Mindrila, 2009). Missing values are to be replaced with mean estimates in order to include all respondents in obtaining factor scores, rather than excluding cases when following SPSS listwise-, or pairwise-options.

No adjustments, using e.g. Anderson-Rubin, or Bartlett methods, will be made to compensate for cross-component correlations resulting from the regression method used to produce the factor scores (Tabachnik & Fidell, 2001), as it has been argued that the concept of Motivation allows for a certain amount of overlap in variance to occur even in components obtained through EFA.

A final methodological analysis is to provide a rationale in generating factor scores.

5.4.2. Sampling

The empirical research is to be performed within a business environment, as indicated Chapter 2.4.3.3., consisting of a series of randomly approached companies[2].

No further sample characteristics, e.g. gender, age, socio-economic background, will be observed, as the research is primarily focused on elementary components capturing Motivation.

In determining an adequate sample size, it is assumed for a data-set consisting of 93 questions as indicated in Chapter 5.3., an indication of 10 participants per variable are needed for an adequate PCA to be performed (Nunnally, 1978; Kass & Tinsley, 1979), with a minimal sample size of n=300 (Comrey & Lee, 1992; Tabachnik & Fidell, 2001; Field, 2005). Where the concept of Motivation is expected to generate higher communalities in the data, n=300 will be used as a minimum standard, whereas data-sets generating elementary information should provide n > 1000 respondents. Furthermore, response percentages are to exceed 70%. For each sample, a KMO analysis of sampling adequacy will be made (Kaiser, 1970).

[1] The concept 'factor scoring' is used, although, given the choice for a PCA approach, a designation 'component scoring' would be more accurate; we adhere, however, to the customary use of the term.

[2] As will be indicated in Chapter 5.5.1., Chapter 5.6.1. and Chapter 5.6.2., the approach provided a 100% response from all companies approached.

Four sets of samples are to be approached in the empirical research:

- *Primary data-set, or 'Core Data' sample*; A sample to be approached at random by means of third parties, not directly related to the researcher[1]. Given the statistical demands as stated in Chapter 5.4.1.1., a total population of n > 1000 participants is aimed for. Given these numbers and the demands of targeting a high number of companies, a minimum is set for the Core Data to consist of at least 10 participating companies within one country to avoid cross-cultural interference. For an adequate sampling to occur, a response of companies approached must exceed 70%, and a subsequent sampling, as stated, must reach at least 70% respondents on average.
- In addition, three secondary data-sets, consisting of:
  - *Performance-related Data;* A set of samples aimed at capturing performance. With the Core Data sample available, lesser demands are formulated: sampling size is to follow general standards with n=300 and a minimal 70% response rate. Two sets of samples are to be generated:
    - *'Higher Ranking Performers';* A single sample of a 'best-in-class' company as indicated by current literature.
    - *'Lower Ranking Performers';* A single sample of a company that is under-performing as indicated by own standards.
  - *Culture-related Data;* A set of samples of companies from differing continents to compensate for effects especially associated with 'cross-cultural differences'. A minimum of three different regions worldwide, in addition to the Core Data region, are to be approached, with a minimum of 2 companies per region, with standard n=300 as a minimal sample size, and at least 70% response rate.
  - *Company-related Data;* A different set of samples is to be categorized according to the different company-related characteristics, aiming at a minimized set of characteristics. With the Core Data available, sampling size is set to a standard n=300 minimal at 70% response rate. The following set of samples is to capture a selection of company-related characteristics:
    - *Type-related Data;* A minimal of 2 x 2 samples of service-oriented companies versus production-oriented companies, to compensate for effects of 'company-types'. To avoid excessive data sampling, the subset is to be generated from available samples.
    - *Profile-related Data;* A minimal set of 2 x 2 samples of 'starters' versus 'established' companies, with a subset generated from available samples.
    - *Market position-related Data;* A minimal set of 2 samples of companies that are downsizing, the subset to be generated from available samples.

[1] Not all samples could be obtained using the sampling approach mentioned: three cross-cultural samples in Malaysia were obtained directly through the researcher. See Chapter 5.6.2.1.

5.4.3. Hypotheses

An analysis through PCA is to lead to elementary components, where following hypotheses are to be met to provide confirmation of an adequate reduction as indicated in the Problem Statement, Chapter 2.5.:

- *Given the Process of Motivation is captured by a Model of Motivation as described in summary in Chapter 3.3.,*
- *... and given this Model of Motivation is assumed to be operationalized through a questionnaire, thus enabling a quantification of effects,*
  following two hypotheses are formulated:
  a) *Hypothesis 1A (H1A): it is hypothesized that the elementary components reduced from a primary 'Core Data' set will include, according to criteria set in Chapter 5.4.1.1., items associated with the theoretical categorization of the most important Phases of the Model, according to concluding observations in Chapter 3.3.4., i.e. Phases 3 and 8: a Phase of Internally Evoked Self-Assessment and a Phase of Dedication.*
  b) *Hypothesis 1B (H1B): It is hypothesized that these elementary components will not only include the above mentioned items, but will follow, according to criteria set in Chapter 5.4.1.2., the theoretical categorization in Phases 3 and 8 from the Model and are each composed of questions that are comparable to the ones provided theoretically to operationalize these distinct Phases.*
- *Given the assumption that the Process of Motivation as described and captured by the Model, has a general stature, i.e. is applicable within any given population, it is hypothesized that the outcomes of a series of representative samples are assumed to yield comparable results, in terms of relevant components;*
  As such three additional hypotheses are formulated:
  a) *Hypothesis 2A (H2A): It is hypothesized that the components obtained from 'Performance-related Data' will yield comparable items as those obtained from the 'Core Data' sample.*
  b) *Hypothesis 2B (H2B): It is hypothesized that components obtained from a selection of 'Culture-related Data' will yield comparable items as those obtained from the 'Core Data' sample.*
  c) *Hypothesis 2C (H2C): It is hypothesized that components obtained from a selection of 'Company-related Data' will yield comparable results as those obtained from the 'Core Data' sample.*

It is assumed, when hypotheses H1A and H1B are fully met, and hypotheses H2A, H2B and H2C are substantially met, that the concept of Motivation has been adequately captured, and from the analysis the elementary constructs from the Model have emerged that represent the Process of Motivation, as indicated by the Problem Statement, Chapter 2.5.

Following a confirmation of hypotheses, it is assumed justified to use factor scores to capture and quantify the Process of Motivation in a verification of subsequent hypotheses.

5.4.4. *Conclusions*

The empirical research is to provide evidence of elementary constructs from the Model of Motivation, in terms of components and their respective items, capturing the Process of Motivation, thus providing evidence in support of the Model.

As proposed in Chapter 1.5., the Model is to provide an explanatory context from which elementary hypotheses, that are critical to the Model, can be derived. In concluding the inductive analysis in Chapter 3.3.4., two Phases were identified to be essential to the Model of Motivation: a Phases of Internally Evoked Self-Assessment and a Phase of Dedication. Both constructs, then, are to be elementary in the formulation of those hypotheses.

The empirical research, then, is to aim at a statistical reduction of a data-set and a subsequent comparison of data with a theoretical categorization of items operationalizing both Phases.

To perform the data-reduction a quantification of the Model of Motivation and its distinct elements is to be made, by means of a questionnaire operationalizing the distinct elements from the Model. As such, it is noted that in this dissertation the objective has been to capture distinct elements from the Model, not to design a measurement instrument.

To provide evidence of the elementary constructs capturing the Process of Motivation according to the Model as proposed in Chapter 3.3., EFA is to be used, rather than CFA, as the principal aim of the analysis is to explore the possible underlying structures in a set of interrelated variables without imposing any preconceived structure on the outcome. In the empirical research a reduction into elementary components is to be obtained by PCA, followed by a further reduction towards distinct factor scores per component.

In the proposed research a randomized and representative sample is supplemented by selections aimed at compensating for differences in Motivation-related performance, cross-cultural influences and for effects of company-related characteristics that are used to verify a hypothesized universal applicability of the Model.

Summarizing, a following research design is proposed:

- *Data Reduction*
  - *Study 1: Core Data: PCA*
  - *Study 2: Comparison with Model: aimed at verification of H1A, H1B*
- *Secondary Data Comparison*
  - *Study 3: Performance-related Data: PCA aimed at H2A*
  - *Study 4: Culture-related Data: PCA aimed at H2B*
  - *Study 5: Company-related Data: PCA aimed at H2C*
- *Factor Score-oriented Research*
  - *Study 6: Core Data generated Factor Scores*

5.5. Empirical Research
Data Reduction
5.5.1. Study 1: Principal Component Analysis Core Data

The Study generates its data from a random sample aimed at verification of H1A and H1B, with reference to Chapter 5.4.3.

1. Methodology

Sample; A total of 10 companies were approached, all located in Europe, The Netherlands, through third parties, as indicated in Chapter 5.4.2., over an eight-year period, consisting of 1549 participants in total. From companies approached, 100% participated in the research, with an average subject response rate of 88.9%. A short description of participating companies is provided in Appendix IV.

Summarizing details are provided in Table 5.1, including an overview of company characteristics as mentioned earlier in Chapter 5.4.2. Data collected in these 10 companies were pooled together to form the so-called 'Core Data' sample.

		Sampling date	n	N	Response	Company-type	Company-location	Company-profile	Company-marketp.	
			Abs	Abs	%					
1	Company I	02-1997	55	55	100.0%	P	NL	S		
2	Company II	09-1997	515	572	90.0%	P	NL	S		
3	Company III	07-1998	44	44	100.0%	S	NL	E		(1)
4	Company IV	01-1999	99	113	87.6%	P	NL	S		
5	Company V	11-1999	151	202	74.8%	P	NL	E	D	(1)
6	Company VI	12-1999	62	71	87.3%	P	NL	E		
7	Company VII	02-2000	69	78	88.5%	S	NL	E		
8	Company VIII	11-2000	104	107	97.2%	P	NL	E		(1)
9	Company IX	02-2002	176	176	100.0%	P	NL	E	D	(1)
10	Company X	12-2003	274	324	84.6%	S	NL	E		
		Totals	1549	1742	88.9%					

Notes:
(1) Sample consisted of Business Unit within larger company

Company-type: P=production, manufacturing-oriented, S=service-oriented
Company-location: NL=Europe, The Netherlands
Company-profile, or 'life-cycle': S='starter' (< 5yrs) E= 'established' profile (> 5yrs)
Company-marketposition: D=Down-sizing

Table 5.1.
Summarized sampling characteristics of the Core Data sample

Procedure; At each location, the HF-2.01 questionnaire was handed out in a classroom-setting were participants were sent by their immediate managers and asked to fill out the forms. A master list of employees was used to monitor response. No match, however, was made between this list and questionnaire-numbers to maintain confidentiality of the responses. Questionnaires were returned in blank, sealed envelopes. Data entry was performed by an external agency.

Measures; The different Stages of the Model of Motivation, organized in eight Phases, were captured in clusters of questions and scored using a forced-choice format, with different scalings. For a definition of distinct clusters, following references are made:

- Cluster 'Phase 1', as described Chapter 3.3.1.1.
- Cluster 'Phase 2', as described Chapter 3.3.1.2.
- Cluster 'Phase 3', as described Chapter 3.3.1.3.
- Cluster 'Phase 4', as described Chapter 3.3.1.4.
- Cluster 'Phase 5', as described Chapter 3.3.1.5.
- Cluster 'Phase 6', as described Chapter 3.3.1.6.
- Cluster 'Phase 7', as described Chapter 3.3.1.7.
- Cluster 'Phase 8', as described Chapter 3.3.1.8.

For constituting items within these clusters, reference is made to Appendix III, Section B.

Analysis; An EFA was performed using PCA, aimed at providing evidence of a match between components obtained and clusters of items captured according to the eight Phases of the Model. The analysis was to proceed in two consecutive steps:

- An EFA using PCA, as provided in the present Chapter,
- a comparative analysis, as provided in Chapter 5.5.2.

The PCA was performed to extract a series of initial components accounting for a substantial variance and thus providing an adequate description of the data-set. In a subsequent rotation phase a further reduction was made into elementary components capturing the Process of Motivation.

All assessments were made using standard SPSS procedures (Norusis, 1990).

2. Results

A number of preliminary analyses were performed on all 93 variables to determine item retention.

First, inter-item correlations were observed with no items exceeding scores of .80, indicating no singularity in data appeared, as defined earlier in Chapter 5.4.1.1. In observing the correlation matrix, the significance value of each correlation was determined and items with a majority of significance values exceeding .05 were

traced. Partial correlations between variables were observed in the anti-image matrix obtained in a subsequent analysis. 93.0% of partial correlations scored <.05, whereas only 1.1% scored ≥ .10. All items that did not comply with criteria defined in Chapter 5.4.1.1. were eliminated. As a consequence, 10 questions were removed from the analysis[1]. The observed Cronbach alpha obtained at this stage in the study was .72.

The resulting data-set consisted of 83 items. A further confirmation for an adequate PCA was obtained through a significant Bartlett's Test of Spherity (p<.00001) indicating no resemblance occurred to an identity matrix. A Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was performed, with a .89 score indicating adequate sampling (Kaiser, 1974; Hutcheson & Sofroniou, 1999). Furthermore, all remaining 83 items scored (well) above a common .50 threshold on all individual variables (Kaiser, 1974; Field, 2005)[2].

A first general overview, with a primarily descriptive purpose, is provided in Table 5.2. Abbreviated items, with response rates, item-scale numbering, Means and SD are provided with percentages of inter-item correlations at p≤.05 and p≤.001 levels. For a full overview of inter-item correlations, reference is made to Appendix V.

A rotation was carried out on these remaining 83 items, using oblique rotation, through direct oblimin, with 21 components emerging with eigenvalues above 1.0. An average communality after extraction was obtained of .60, which, together with the sample size exceeding 250, meets criteria for an adequate extraction defined in Chapter 5.4.1.1.

An inspection of the scree plot, provided in Fig. 5.1., revealed there was a clear divide at 3 components and a second divide at 7 components[3]. These 7 components accounted for a cumulative 37.0% of total variance.

The inflexions justified isolating the first 3 components as primary components and the next 4 as secondary. Although emphasis in the analysis should be laid on the first 3 primary components, these remaining 4 secondary components should not be discarded entirely from the analysis and considered as a possible extension, or even alternative, to the primary components in capturing the concept of Motivation.

[1] These items produced a majority (≥ 50%) of significance values exceeding .05. With reference to Appendix III, Section B., these items included: h, k, m, n, af, ag, am, cm, dq and dw.

[2] 80 items scored above .70, with 3 items scoring lower: .668 (ad), .681 (dn) and .586 (ae).

[3] With following eigenvalues: Component 1: 11.84, Component 2: 5.95, Component 3: 3.47, Component 4: 2.57, Component 5: 2.39, Component 6: 2.33, Component 7: 2.13 and Component 8: 1.84, Component 9: 1.72, with Δ-values between component 6 and 7 of 0.20, between 7 and 8 of 0.29 and between 8 and 9 of 0.11.

	Item	N	Mean	SD	Scale	Inter-item Corr.	
						<.05	<.001
(1)	(2) (3)	(4)		(5)	(6)	(7)	(8)
l	I work extremely hard/could do much more	1462	6.67	2.92	15	52.44%	31.71%
L	I am "not at all"/"very ambitious"	1509	3.56	0.86	5	80.49%	65.85%
o	I am "easy to approach"/more "at a distance"	1507	2.05	0.91	5	79.27%	50.00%
q	In my work, I tend to set clear/unclear goals	1521	1.95	0.77	5	90.24%	75.61%
r	Outs. my work, I tend to set clear/unclear goals	1498	2.20	0.91	5	75.61%	60.98%
s	In my work, I tend to set a lot of goals/no goals	1511	2.47	0.76	5	91.46%	75.61%
t	Outs. my work, I set a lot of goals/no goals	1495	2.59	0.86	5	80.49%	53.66%
u	In my work, I set realistic/unrealistic goals	1513	1.96	0.71	5	79.27%	59.76%
v	Outs. my work, I set realistic/unrealistic goals	1495	2.03	0.75	5	70.73%	48.78%
w	In my work, I always/hardly ever reach my goals	1511	2.32	0.66	5	90.24%	70.73%
x	Outs. my work, I always/hardly ever reach goals	1495	2.28	0.67	5	78.05%	60.98%
y	In my work, I am sat./dissat. in the goals I set	1519	2.11	0.71	5	93.90%	82.93%
z	Outs. my work, I am sat./dissat. in goals I set	1501	1.90	0.72	5	85.37%	68.29%
ab	In my work, I tend not/tend to be dissapointed	1508	2.14	0.88	5	93.90%	79.27%
ac	Outs. my work, I tend not/tend to be dissapointed	1481	2.00	0.89	5	73.17%	52.44%
ad	In my work, I would stop/retry until the end	1507	3.98	0.85	5	81.71%	52.44%
ae	Outs. my work, I would stop/ retry until the end	1477	3.90	0.92	5	50.00%	20.73%
ai	In my work, I would spend, XX% of my energy	1516	90.61	13.09	9	89.02%	64.63%
aJ	… during XX% of my time	1499	82.73	17.58	9	74.39%	39.02%
aL	Outs. my work, I would spend, XX% of energy	1489	89.31	14.07	9	56.10%	36.59%
ao	In my work, I have a lot/no real "challenges"	1497	2.67	1.08	5	85.37%	65.85%
aq	Outs. my work, I have a lot/no real "challenges"	1481	2.50	0.89	5	58.54%	29.27%
at	In my work, I'd like to set more feasible goals	1522	3.67	1.75	7	60.98%	25.61%
au	In my work, I'd like to get sat. from things I do	1525	3.42	1.76	7	67.07%	46.34%
av	In work, I'd like to put more effort in things I do	1522	4.92	1.80	7	68.29%	32.93%
ba	Outs. my work, I'd like to set more feasible goals	1490	4.25	1.76	7	59.76%	24.39%
bb	Outs. work, I'd like to get more sat. from things	1489	4.61	1.74	7	68.29%	37.80%
bc	Outs. my work, I'd like to put more effort in things	1484	4.53	1.84	7	67.07%	42.68%
be	The company goals are clear/unclear to you	1519	2.40	1.22	5	76.83%	51.22%
bf	You do/do not agree with the company goals	1480	2.45	0.97	5	80.49%	53.66%
bg	Your work is not/is aimed at achiev. Comp. goals	1480	3.43	1.05	5	70.73%	39.02%
bi	Company goals do/do not interfere with my goals	1434	6.00	2.76	15	79.27%	54.88%
bk	Willing to change goals towards goals company	1473	3.55	1.42	7	80.49%	54.88%
bL	Ever changed goals to the company goals	1478	3.45	1.56	7	54.88%	28.05%
bm	I have reached the goals the company has set	1476	2.98	1.28	7	82.93%	68.29%
bn	My job contribution is significant to the company	1489	2.65	1.25	7	85.37%	71.95%
bp	How would you rate your performance	1519	6.54	0.97	8	95.12%	85.37%
bq	How would you rate your immediate manager	1506	5.55	1.65	8	64.63%	42.68%
br	How would your manager rate your performance	1501	6.25	1.09	8	91.46%	75.61%
bs	How would you rate performance of colleagues	1505	6.01	1.14	8	70.73%	51.22%
bv	I am satisfied/dissatisfied recognition manager	1506	2.60	1.02	5	57.32%	42.68%
bw	I have no fear at all/serious fear on job continuity	1516	2.21	1.22	5	70.73%	48.78%

Notes:
(1) Reference used
(2) Items are formulated in abbreviated format.
(3) Items h, k, m, n, af, ag, am, cm, dq and dw were omitted from the list, following a suitability analysis prior to PCA
(4) Respondents per item
(5) Standard Deviation; For each variable, missing values are replaced with the variable mean
(6) Likert-scale
(7) Percentages of inter-item correlations at p <.05
(8) Percentages of inter-item correlations at p <.001

Table 5.2.
Summarized statistics of the Core Data sample
A full overview of inter-item correlations is provided in Appendix V

	Item	N	Mean	SD	Scale	Inter-item Corr.	
						<.05	<.001
(1)	(2) (3)	(4)		(5)	(6)	(7)	(8)
Continued…							
bx	*Very/not at all confident management decisions*	*1506*	2.91	0.97	*5*	*69.51%*	*53.66%*
by	*Very/not at all confident about future company*	*1505*	2.37	1.06	*5*	*71.95%*	*59.76%*
cb	*Performance improvement: small/large*	*1265*	8.56	2.99	*15*	*70.73%*	*36.59%*
cc	*Working on improving your performance*	*1256*	2.62	0.97	*5*	*57.32%*	*21.95%*
ce	*I feel a lot of respect/no respect for company*	*1512*	2.95	1.27	*7*	*81.71%*	*68.29%*
cf	*I feel I am much/not respected by the company*	*1509*	3.31	1.35	*7*	*85.37%*	*70.73%*
cg	*I feel I am much/not dedicated to the company*	*1500*	2.63	1.23	*7*	*91.46%*	*81.71%*
ch	*I have invested a lot in the company*	*1507*	2.37	1.13	*7*	*87.80%*	*68.29%*
ci	*I feel I owe the company a lot*	*1508*	3.23	1.38	*7*	*80.49%*	*67.07%*
cn	*Effort is lower/higher, than it used to be*	*1496*	4.54	1.14	*7*	*69.51%*	*40.24%*
co	*Dedication to the company is lower/higher*	*1492*	4.24	1.10	*7*	*70.73%*	*46.34%*
cp	*Opinion company is more negative/ positive*	*1490*	3.92	1.29	*7*	*58.54%*	*39.02%*
cr	*I have met the expectations of the company*	*1483*	2.33	1.04	*7*	*92.68%*	*73.17%*
cs	*I am honored to work for the company*	*1505*	3.31	1.42	*7*	*76.83%*	*60.98%*
ct	*My respect for the company is extremely high*	*1506*	3.43	1.39	*7*	*79.27%*	*63.41%*
cv	*I tend to overestimate/underestimate myself*	*1516*	4.48	1.01	*7*	*59.76%*	*35.37%*
cw	*I tend to have a high/low self-esteem*	*1512*	4.04	1.00	*7*	*62.20%*	*40.24%*
cx	*Initiating things is easy/difficult*	*1514*	2.74	1.29	*7*	*82.93%*	*69.51%*
cy	*I like to be with people/take detached approach*	*1516*	2.46	1.28	*7*	*82.93%*	*65.85%*
cz	*I tend to appreciate things/tend to be critical*	*1514*	4.63	1.48	*7*	*64.63%*	*39.02%*
db	*I can easily change my opinion*	*1513*	4.59	1.24	*7*	*57.32%*	*25.61%*
dc	*I tend to make things brighter*	*1512*	4.85	1.40	*7*	*60.98%*	*28.05%*
dd	*I am inclined to review my actions*	*1510*	2.57	1.14	*7*	*84.15%*	*56.10%*
df	*I tend to set my expectancies very high/low*	*1509*	2.93	1.07	*7*	*87.80%*	*64.63%*
dg	*I tend to invest great/little effort*	*1510*	2.29	0.93	*7*	*89.02%*	*73.17%*
dh	*I tend to work for long/short periods of time*	*1502*	2.71	1.15	*7*	*86.59%*	*69.51%*
dJ	*I would characterize myself as: enthus./reserved*	*1516*	2.06	0.95	*5*	*90.24%*	*78.05%*
dk	*I would characterize myself as: optimistic/pess.*	*1498*	1.95	0.84	*5*	*91.46%*	*82.93%*
dL	*I would characterize myself as: realistic/speculat.*	*1512*	1.85	0.69	*5*	*69.51%*	*56.10%*
dm	*I would characterize myself as: active/withdrawn*	*1499*	1.84	0.78	*5*	*93.90%*	*85.37%*
dn	*I would characterize myself as: patient/impatient*	*1517*	2.52	1.09	*5*	*47.56%*	*18.29%*
do	*I would characterize myself as: sensitive/rational*	*1499*	2.67	1.06	*5*	*56.10%*	*26.83%*
dr	*I am persistent/I easily give up*	*1514*	1.75	0.67	*5*	*96.34%*	*82.93%*
ds	*I am firm/I am gentle*	*1511*	2.80	0.96	*5*	*75.61%*	*56.10%*
dt	*I am critical/I consent*	*1511*	2.11	0.80	*5*	*73.17%*	*59.76%*
du	*I am a leader/I am a follower*	*1513*	2.63	0.86	*5*	*82.93%*	*64.63%*
dv	*I am direct/I am tactful*	*1510*	2.43	1.02	*5*	*64.63%*	*35.37%*
dx	*I tend to choose carefully/impulsively*	*1511*	2.45	0.93	*5*	*58.54%*	*25.61%*
dz	*Summarizing, my dedication to the company*	*1517*	8.16	2.07	*11*	*95.12%*	*87.80%*
eb	*Summarizing, overall impression of the company*	*1516*	7.35	2.15	*11*	*76.83%*	*58.54%*
ec	*Summarizing, I would rate my motivation*	*1518*	8.60	1.86	*11*	*93.90%*	*81.71%*

Notes:
(1) Reference used
(2) Items are formulated in abbreviated format.
(3) Items h, k, m, n, af, ag, am, cm, dq and dw were omitted from the list, following a suitability analysis prior to PCA
(4) Respondents per item
(5) Standard Deviation; For each variable, missing values are replaced with the variable mean
(6) Likert-scale
(7) Percentages of inter-item correlations at p <.05
(8) Percentages of inter-item correlations at p <.001

Table 5.2 (Continued)
Summarized statistics of the Core Data sample
A full overview of inter-item correlations is provided in Appendix V

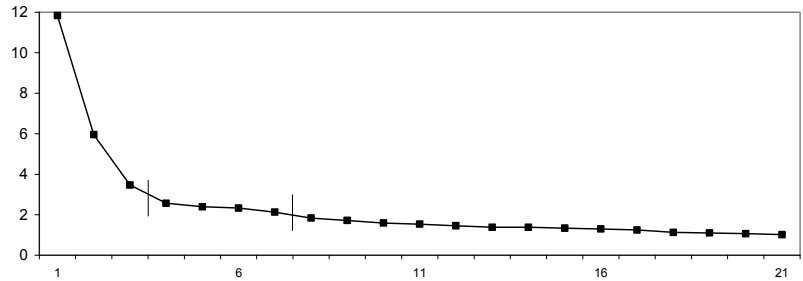


Fig 5.1.
Scree plot with eigenvalues and respective components (restricted to eigenvalues >.100)

Table 5.3. contains the 7 components as they emerged after rotation, and their respective items with component loadings as obtained from the pattern matrix. Component loadings of .40 or greater were considered significant and used to visualize the different components, as defined in Chapter 5.4.1.1. For an overview of all emerging components, reference is made to Appendix VI

Component 1 consisted of 8 items and appeared to measure Dedication, as exhibited by expressions of respect (e.g. items ce, ct), esteem (e.g. items cs, eb and ci), and expressed dedication (e.g. items cg and dz), with loadings ranging from .52 to .81. The internal consistency reliability estimate for component 1 was .90. Component 2 consisted of 4 items and appeared to represent items indicating Personality, (items ds, dt, du dv) with loadings ranging from .70 to .48. The reliability estimate of the component was .68. Component 3 contained 6 items, that appeared to represent an evaluation of Achievement (e.g. items ba, at and bc, av) and Satisfaction (e.g. items bb and au) with component loadings ranging from .79 to .40, yielding a .78 reliability estimate. *From these primary components 1, 2 and 3, component 2 produced a reliability estimate below the minimum criterion of .70 and was therefore discarded as a reliable indication of the concept of Motivation, as defined by initial standards set in Chapter 5.4.1.1. Consequently, the analysis provided two primary components 1 and 3, to be designated in the following as components 'DEDICAT' and 'ACHIEV' respectively.*

From the secondary components 4, 5, 6 and 7, component 4 consisted of 5 items and seemed to represent Personality-related scales: a cluster of items o, cy, dJ, dm and dk reflected elements from a Phase of Expectancies, with diversification in a Stage of Attitude, according to Appendix III, Section B. Component loadings ranged from .76 to .49, with an internal consistency reliability score of .78.

	Item	Components (3) (4)						
(1)	(2)	1	2	3	4	5	6	7
cs	*Honored to work for the company*	0.812						
ce	*Respect/no respect for company*	0.809						
ct	*Respect for the company is high*	0.766						
cg	*Dedicated to the company*	0.691						
eb	*Overall impression of the company*	-0.663						
ci	*Owe the company a lot*	0.647						
dz	*Dedication to the company*	-0.612						
cf	*Respected by the company*	0.521						
dt	*I am critical - consent*		0.701					
dv	*I am direct - tactful*		0.701					
ds	*I am firm - gentle*		0.586					
du	*I am a leader - follower*		0.478					
ba	*Outside work, setting goals*			0.789				
bc	*Outside work, investing effort*			0.761				
bb	*Outside work, obtaining satisfaction*			0.750				
av	*At work, investing effort*			0.679				
at	*At work, setting goals*			0.550				
au	*At work, obtaining satisfaction*			0.401				
o	*I am easy - distant*				0.759			
cy	*I socialize - take a detached approach*				0.746			
dJ	*I am enthusiastic - reserved*				0.734			
dm	*I am active - withdrawn*				0.555			
dk	*I am optimistic - pessimistic*				0.491			
dx	*I am cautious - impulsive*					-0.760		
dn	*I am patient - impatient*					-0.657		
l	*I work hard - could do much more*						0.612	
ch	*Invested a lot in the company*						0.585	
bn	*Contribution is significant*						0.560	
bm	*Reached the goals the company has set*						0.445	
cr	*Met the expectations of the company*						0.419	
ai	*At work, would spend XX% of energy*							0.852
aJ	*… during XX% of time*							0.779
aL	*Outs. work, would spend XX% of energy*							0.759
	Initial eigenvalues	*11.836*	*5.952*	*3.473*	*2.567*	*2.394*	*2.330*	*2.130*
	Alpha coefficient for final components	*.90*	*.68*	*.78*	*.78*	*.44*	*.55*	*.71*

Notes:
(1) Reference used
(2) Items are formulated in abbreviated format. A full overview of items is provided Appendix III
(3) Oblique rotation (direct oblimin) with Kaiser normalization
(4) Only factor loadings >.400 are visualized

Table 5.3
Principal Component Analysis Core Data sample;
Pattern Matrix of seven primary and secondary components extracted through nonorthogonal rotation.

Component 5 contained only two Personality-oriented items dx and dn with a modest reliability estimate of .44. Component 6 consisted of 5 items, representing an evaluation of the company of the investment made by the individual. With a cluster of items i, ch, bn, bm and cr, the component reflects Reality, as indicated in Appendix III, Section B. The internal consistency reliability estimate for component 6, however, was a modest .55. Finally, component 7 included items ai, aJ, aL indicating Effort, with loadings ranging from .85 to .76, and a reliability estimate of .71. *These secondary components 4, 5, 6 and 7 were evaluated according to standards of Chapter 5.4.1.1., resulting in elimination of components 5 and 6 with reliability estimates below .70. The analysis therefore provided two secondary components, 4 and 7 to be designated as components 'ATTITUD' and 'EFFORT' respectively.*

As a result the PCA produced 4 components, 2 primary and 2 secondary, to capture the concept of Motivation. However, after nonorthogonal rotation and a successful reduction of the initial components to their respective principal dimensions, as set forth in Chapter 5.4.1.1., a dilemma emerged in obtaining a final indication of adequacy of the components that had been isolated. The oblique rotation provided an optimal approach for reducing the concept of Motivation that appeared to demonstrate a considerable shared variance among components. But the oblique rotation did not allow an adequate verification in terms of maximized shared variance. As a result of the rotation, items initially contained within the 7 initial components, had been re-allocated towards other components thereby changing the eigenvalues of these resulting components and the assumed variance they accounted for. In using a nonorthogonal rotation, the rotated components shared common variance and consequently variance could not be partitioned uniquely among components. As a result, a cumulative variance could not be deduced for isolated components.

Oblique rotation enables an adequate reduction towards correlated components, but deprives the analysis of an indication of shared variance. An additional rotation was performed, using an uncorrelated orthogonal varimax rotation. A demonstration of measurement equivalence, obtaining corresponding components with equal items loading on each component, would provide additional evidence of a successful extraction (Ryan, *et al.,* 1999).

Given the substantial number of variables, the results coincided largely with the original PCA-generated data obtained through the oblique, direct oblimin rotation (Guadagnoli & Velicer, 1988; Stevens, 2002). With reference to Appendix VII, All items contained in component 1 from the direct oblimin rotation matched those obtained in component 1 of the varimax rotation, with only 1 item (ec) unmatched in the latter. There was a complete match in both components 3 following direct oblimin and varimax rotations, and a complete mach between component 4, following direct oblimin and component 2 following varimax rotations. A subsequent analysis of eigenvalues and total variance explained following varimax rotation, revealed a primary ranking of these three components accounting for a

cumulative 15.56% of total variance[1]. *Although the component loading weights varied slightly across both approaches, the PCA yielded the same components and similar item loading patterns. The near perfect item match between both extraction techniques provided a further indication that elementary components were obtained.*

Finally, in a short analysis of pairwise and listwise approaches to handling of missing data, same results were obtained, with reference to Appendix VIII and Appendix IX respectively, adding further confirmation to these general findings.

3. Discussion

A principal aim of PCA and factor extraction was to obtain the elementary components of the Process of Motivation. First indications are that four components were obtained that met the criteria initially set in Chapter 5.4.1.1. And if so, a first and important step has been made not only towards isolating these elementary components, but also towards providing a means of having an objective representation of the concept, capturing its true signature.

A number of limitations apply, however.

A first and obvious limitation lays in the questionnaire HF-2.01: answers are pre-coded and do not provide an opportunity for personal nuance. Moreover, the sequence of questions as contained in the questionnaire could have influenced the outcomes, especially in component ACHIEV.

A second limitation is that data were obtained exclusively from the Netherlands, and relations may differ in other countries (Fletcher & Perry, 2001). Nonetheless, representativity of the samples meets criteria initially set in Chapter 5.4.2., with response rates in excess of 85%. In Chapter 5.6.2., these findings will be supplemented with culture-related data from other countries.

Furthermore, it is stressed again at this point that, the present research consists of a first study to verify the accuracy of the Model of Motivation in representing the Process of Motivation. The questionnaire was aimed primarily at capturing distinct elements from the Model and was not designed as a measurement instrument. As indicated in Chapter 5.3., to apply the questionnaire as a measurement instrument, further research is needed to provide additional data for assessing various psychometric characteristics in terms of reliability and validity.

[1] An analysis of component 7 following direct oblimin, matched component 11 through varimax rotation accounting for 2.47% of variance, resulting in a total variance explained through these 4 primary and secondary components of 18.03%.

Finally, a concluding observation on results obtained. There is a fundamental objection to the conclusion of having found Motivation in its 'most important' components by means of PCA. And the objection lays in the interpretation of PCA in general, and the non-orthogonal oblique oblimin extraction in particular. PCA does not provide a means of distilling the 'most important' components from a data-set. Before extraction, eigenvalues associated with each component represent the variance explained by that particular linear component, and therefore provide an indication of the percentage of variance explained by that factor. As such, first 7 components accounted for a substantial amount of total variance, as indicated in initial criteria set. In terms of variance explained, these 7 are most important, but variance in itself does not provide an indication of causality, or a validation for a comprehensive description of the concept. The study has chosen not to provide indications for causality, or comprehensiveness as a criterion, but rather to 'capture the concept in its essential nature'. As such, it has chosen these 7 components, on a criterion of representation: these 7 were best suited, on the basis of variance explained. From these initial components, the elementary components were extracted, in the assumption that these components have the effect of optimizing the underlying component structure. The elementary components obtained, cannot be designated at this stage as being 'most important'. A subsequent comparison with the Model and an optimal fit, in terms of interpretability of the data obtained, is to provide a final indication of the merit of the elementary components that were found. As Meyers et al. eloquently summarized: 'if you have to articulate a bottom line for characterizing what researchers finally select, (it is) ... the reasonableness of the interpretation' [1].

4. Conclusion

A data-set, representing a Model of Motivation has been reduced to elementary components by means of PCA, using nonorthogonal rotation techniques. After eliminating components that did not meet internal consistency reliability standards, two primary components were isolated, designated as DEDICAT and ACHIEV. From a secondary set of components, two additional clusters were isolated, designated as ATTITUD and EFFORT.

In a preliminary conclusion these primary and secondary components are to be matched with the Model of Motivation to obtain evidence if these components reflect the elementary constructs suggested by the Model, as called for in our Problem Statement. Emphasis should be laid, however, on the primary components, with the secondary components to be considered as experimental and an extension, or possibly an alternative, of the indices suggested by the Model.

[1] Meyers, Gamst & Guarino, 2006, p. 512.

5.5.2. Study 2: Model Comparison

The study is aimed at verification of hypotheses H1A and H1B, with reference to Chapter 5.4.3. A comparison is to be made between items capturing the eight Phases of the Model of Motivation, indicated as 'clusters', and the components obtained through PCA from the Core Data sample.

1. Methodology

Measures; Components obtained from the Core Data sample were defined as primary and secondary components. Emphasis in the analysis was to be laid on the primary components, with secondary components considered as extension or alternative in capturing the concept of Motivation. Primary components were components with highest eigenvalues, accounting for highest percentages of variance amongst items. As stated in Chapter 5.5.1.3., a subsequent comparison with the Model of Motivation and an optimal fit, in terms of interpretability of the data obtained, is to provide a final indication of the merit of the elementary components that were found. For this reason, the study will include in its analysis not only primary components, but also secondary components that were obtained after rotation following the PCA.

The elementary components, then, that are assumed to capture the Process of Motivation, are defined as follows:

- Primary component DEDICAT, consisting of items referenced as: ce, cf, cg, ci, cs, ct, dz and eb
- Primary component ACHIEV, consisting of items referenced as: at, au, av, ba, bb and bc
- Secondary component ATTITUD, consisting of items referenced as: o, cy, dj, dk and dm
- Secondary component EFFORT, consisting of items referenced as: ai, aj and aL

For a full description of references used in designating items, see Appendix III, Section B., for an abridged overview, see Table 5.3.

Analysis; The analysis was to proceed in two consecutive steps:

- An EFA using PCA, as provided in Chapter 5.5.1.,
- a comparative analysis, as provided in the present Chapter

As a consequence of restrictions applying to comparing 2x2 matrices at a nominal level, as indicated Chapter 5.4.1.2., the analysis was performed using several measures of comparison. A measure of relative overlap was provided by indicating sensitivity and specificity. A measure for inferring an indication of strength and significance in results obtained, was provided by Phi and symmetric Lambda coefficients. As in isolating the primary and secondary components, a match would be achieved with both Φ and λ significant at $p<.05$.

2. Results

An overview of measures obtained from the comparative analysis is provided in Table 5.4.

Component Comparison	*Overlap*	*Sensitiv.*	*Specific.*	*Φ*	*Λ*
	%	%	%		
(1) (2)	*(3)*	*(4)*	*(5)*	*(6) (7)*	*(8) (9)*
1 *Model Phase 8 vs Core Data DEDICAT*	100.0%	100.0%	100.0%	*1.000****	*1.000***
2 *Model Phase 3 vs Core Data ACHIEV*	100.0%	100.0%	100.0%	*1.000****	*1.000**
3 *Model Phase 1 vs Core Data ATTITUD*	15.0%	15.0%	96.8%	*.213*	*.040*
4 *Model Phase 2 vs Core Data EFFORT*	50.0%	50.0%	100.0%	*.694****	*.333*

Notes:
(1) Item Cluster Phase 8 consists of questions ce, cf, cg, ci, cs, ct, dz and eb
Item Cluster Phase 3 consists of questions at, au, av, ba, bb and bc
Item Cluster Phase 1 consists of questions L, q, r, s, t, u, v, w, x, y, z, cx, dJ, dk, dL, dm, ds, dt, du and dv
Item Cluster Phase 2 consists of questions ai, aJ, aL, df, dg and dh. Question am, initially included, was later omitted
(1) Core Data Component DEDICAT consists of items ce, cf, cg, ci, cs, ct, dz and eb
Core Data Component ACHIEV consists of items at, au, av, ba, bb and bc
Core Data Component ATTITUD consists of items o, cy, dj, dk and dm
Core Data Component EFFORT consists of items ai, aj and aL
(3) Percentage overlap relative to Core Data sample
(4) Sensitivity is represented by the equation: TP/(TP + FN), where TP=True Positive Classification, FN=Fake Negative Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(5) Specificity is represented by the equation: TN/(FP + TN), where TN=True Negative Classification, FP=Fake Positive Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(6) Phi Coefficient
*(7) * p < .05, ** p < .01, *** p < .001*
(8) Guttman's Coefficient of Predictability Lambda
*(9) * p < .05, ** p < .01, *** p < .001*

Table 5.4.
Comparative Analysis Model of Motivation and Core Data sample;
Clusters of questions indicating different Phases of the Model compared to 4 elementary components obtained from PCA; Measures not meeting criteria are shaded.

Row 1 contains the parameters of a comparison between clusters of items capturing Phase 8, a Phase of Dedication, within the Model of Motivation as indicated in Appendix III, Section B., and those obtained from the PCA designated as component DEDICAT. Both clusters of items matched completely, with both sensitivity and specificity of 100%, resulting in Φ and λ scores significant at p<.01.

Row 2 contains parameters of a comparison between the cluster of questions operationalizing Phase 3, a Phase of Internally Evoked Self-Assessment as indicated in Appendix III, Section B., with the items contained in component ACHIEV. Again, both clusters matched completely with equivalent scores as those obtained for Phase 8 and DEDICAT.

Row 3 indicates the parameters of a comparison between Phase 1, a Phase of Expectancies, with items from component ATTITUD. There was no significant

match, however, between both clusters[1].

Likewise, in comparing a Phase of Effort to component EFFORT, a match was insufficient, yielding only a significant result on a Φ coefficient.

These results were evaluated according to standards defined in Chapter 5.4.1.2. As a consequence, the two secondary components ATTITUD and EFFORT were eliminated from the analysis.

As a principle outcome, then, the primary components DEDICAT and ACHIEV were found to meet the criteria initially set. And, as a consequence, both hypotheses seem to be supported, as formulated at the onset of the analysis. It was hypothesized that the elementary components reduced from a primary Core Data-set, would include all items associated with the theoretical categorization of the most important Phases of the Model, i.e. Phases 3 and 8 (H1A). Both components DEDICAT and ACHIEV do include these items as suggested by the Model and formulated in Appendix III, Section B. Moreover, not only do both clusters coincide, they also match the distinction made in the respective Phases 3 and 8, as formulated in the second hypothesis. It was hypothesized that these elementary components, would not only include the above mentioned items, but would follow the theoretical categorization in Phases 3 and 8 from the Model and are each composed of questions that are comparable to the ones provided theoretically to operationalize these distinct Phases (H1B). Component DEDICAT matches completely with items suggested operationalizing a Phase of Dedication, component ACHIEV, matches with those operationalizing a Phase of Internally Evoked Self-Assessment.

The results of the study, then, provide support for the general hypothesis that elementary components captured through data reduction, indicated by primary components DEDICAT and ACHIEV, do match with those suggested by the Model of Motivation, thus providing empirical evidence in support of the proposed Model.

3. Discussion

Following an oblimin rotation, initial components were reduced to two sets of elementary components, two primary and two secondary. These four components contained the items that described the 'essential nature' of Motivation according to the PCA and associated data reduction techniques. From a subsequent comparative analysis it was found that primary components matched completely with the items suggested theoretically through the Model, describing the Process of Motivation in its essential nature. As a result, it was decided to discard the two secondary components as being less adequate to provide substantial additional descriptive

[1] The component ATTITUD matched with a specific Stage within the Phase of Expectancies, i.e. a Stage of Attitude. The analysis, however, did not focus on separate Stages and was therefore discarded from the study.

information.

Two additional comments are made to substantiate this conclusion.

First, the Problem Statement called for items capturing the Process of Motivation in elementary constructs, not for a summative set of describing items. Discarding the secondary components is not to be interpreted as eliminating elementary components as suggested through PCA, but rather as a further reduction towards the essential nature of Motivation supported by theoretical arguments.

In addition, the perfect match between elements obtained though PCA and the theoretically induced items from the Model of Motivation, does provide additional evidence that the primary components that were isolated can be considered adequate in describing the concept in its essential nature.

The conclusion, therefore, seems justified to identify the primary components DEDICAT and ACHIEV as being the elementary components capturing the Process of Motivation.

However, in reaching these conclusions, a number of limitations must be considered.

Although the extraction and subsequent data comparison justify isolating components DEDICAT and ACHIEV, it was observed in Chapter 5.5.1.2., that emphasis in the analysis was laid on these primary components as the secondary components produced lower eigenvalues, as indicated in Fig. 5.1., by a second inflexion of the scree plot curve. However, it is to be noted that with the various eliminations of components the initial eigenvalue of component ACHIEV (3.473, as indicated Table 5.3.), approaches the values of both secondary components ATTITUD (2.507) and EFFORT (2.130). Although criteria defined in Chapter 5.4.1.1. and Chapter 5.4.1.2. justify an identification of the primary components, some caution is to be expressed especially on component ACHIEV, based on these initial eigenvalues, in capturing Motivation.

A second limitation follows directly from these comments aiming at capturing Motivation in essential components rather than in a summative set of describing items. In using the outcomes from the present study, it is to be explicitly stressed that the elementary components are not covering the concept of Motivation in its entirety, but rather in its essentials. The Model of Motivation is assumed to comprise all eight Phases of the Model. Within these eight Phases, Phases 8 and 3, expressed in components DEDICAT and ACHIEV, are to be considered essential, but they do not eliminate or replace other Phases from the Process.

Finally, in addition to these conceptual limitations, it is to be noted, that the research was restricted to a first validation and reduction to elementary constructs. The Model was assumed to represent the Process of Motivation. Additional research will be needed to verify and further validate these claims.

4. Conclusion

In a second study, a comparison was made between clusters of questions assumed to indicate the most important Phases 3 and 8 within the Model of Motivation, and the elementary components obtained through PCA.

Hypotheses initially formulated were found to be supported. In hypothesis 1A (H1A) it was assumed that the components reduced from a primary Core Data-set, would include all items associated with the theoretical categorization of the most important Phases of the Model, i.e. Phases 3 and 8. In hypothesis 1B (H1B) it was assumed that these components, would not only include the above mentioned items, but would follow the theoretical categorization in Phases 3 and 8 from the Model and would each be composed of questions that are comparable to the ones provided theoretically to operationalize these distinct Phases.

With both components DEDICAT and ACHIEV matching items operationalizing Phases 8 and 3 respectively, hypotheses H1A and H1B were met.

It is concluded that the analysis produced elementary constructs matching those from the Model of Motivation, and consequently, that the empirical research provided evidence of elementary constructs from the Model, in terms of components and their respective items, matching those suggested capturing the Process of Motivation, thus providing empirical evidence in support of the Model.

5.5.3. *Conclusions*

Given the Problem Statement, the empirical research was aimed at tracing the elementary components that capture the concept of Motivation, while preserving, as much as possible, its original signature.

On the initial set of questions, a data reduction was performed in Study 1 through PCA, resulting in two sets of components, one primary and one secondary. Emphasis was to be laid on the primary components, with the secondary components to be considered as experimental and an extension, or possibly an alternative, in adequately capturing the concept of Motivation.

In a subsequent comparative analysis in Study 2, these items obtained through PCA were matched with clusters of questions operationalizing most important Phases 3 and 8 from the Model of Motivation, as obtained from the theoretical inductive inference as reported in Chapter 3. In the analysis it was found that secondary components did not meet criteria and were discarded. Primary components, however, appeared to match completely with those suggested from the theoretical Model.

As such, these primary components, designated as components 'DEDICAT' and 'ACHIEV' were found to match those suggested by the Model of Motivation, and indicative of Phases 3 and 8:

- *Component DEDICAT, consisting of items: ce, cf, cg, ci, cs, ct, dz and eb.*
- *Component ACHIEV, consisting of items: at, au, av, ba, bb, bc*

Following these results, it was concluded that hypothesis H1A, assuming both components would include all relevant items, and hypothesis H1B, assuming these components would match with items distinctly associated with Phases 3 and 8, both were supported by the studies.

The empirical research, then, provided evidence that components DEDICAT and ACHIEV as obtained from the analysis, are the elementary constructs called for in the Problem Statement, Chapter 2.5., that capture the Process of Motivation.

5.6. Empirical Research
Secondary Data Comparison

Given the assumption that the Model of Motivation has a general stature and is therefore applicable within any given population, it is hypothesized that the outcomes of a series of representative samples are assumed to yield comparable results to those obtained from the previous analysis, where components DEDICAT and ACHIEV were isolated as being the elementary constructs capturing the Process of Motivation.

Three additional Studies are briefly presented in a Secondary Data Comparison to verify these assumptions.

5.6.1. Study 3: Performance-related Data

A first analysis observes data from a sample of so-called 'Higher Ranking Performers' and ' Lower Ranking Performers' aimed at verification of H2A, with reference to Chapter 5.4.3.

1. Methodology

Sample; Following commentaries in literature[1] and an overall classification as 'best

[1] Two references were used, classifying companies as 'best-in-class' according to research based on both company-related data and survey results:

- Kinni, T.B. (1996). *America's Best - Industry Week's Guide to World-Class Manufacturing Plants.* New York: John Wiley.
- Levering, R., & Moskowitz, M., (1994). *The 100 Best Companies to Work For in America.* New York: Plume, Penguin Books.

company' according to the American Malcolm-Baldrige Award[1], a single company was approached as 'Higher Ranking Performer'[2]. Within this multinational company, with several business units and a range of production plants world-wide, a single location was selected that outperformed all other business units within this company, based on an internal award-structure as a selection criterion[3]. The facilities were located in South-East Asia, Malaysia, Penang. From the 24 hour shift production group of employees a 10% random sample was taken and pooled to all non-production employees, including staff, middle and higher management, resulting in a n=358 sample, with 100% response rate.

Next, from all companies participating in this dissertation, 22 in total, the company with the lowest summative mean score average on all 83 items, was selected as 'Lower Ranking Performer'. Although the sample size did not meet criteria set in Chapter 5.4.2., with n=134, no additional samples from other companies were added in order to preserve the integrity of the selection made.

A short description of both companies, referred to as Company XI and Company XII respectively, is provided in Appendix X. Summarizing details are provided in Table 5.5.

Procedure; At both locations, the HF-2.01 questionnaire was handed out in a classroom-setting. The procedure as described in Chapter 5.5.1.1. was followed at both locations. The questionnaire was translated and made available both in English and in Bahassa Malaysia at Company XI facilities.

Measures; Given a presumed hypothesis *H2A* a comparison was to be made between the components obtained through PCA from the Core Data sample and those obtained from both Higher and Lower Ranking Performer samples in the assumption that comparable data would emerge[4].

[1] The Malcolm Baldrige National Quality Improvement Act of 1987, signed by President Ronald Reagan on August 20th 1987, established an annual U.S. National Quality Award aimed at promoting quality awareness and recognizing quality achievements of U.S. companies. Areas that were examined included leadership, human resource utilization and customer satisfaction, among others.

[2] In the period 1988 – 1996 a single company emerged from both categorizing overviews that had also won the Malcolm Baldrige Award. The company was referenced as 'Company XI' in the Study.

[3] The criterion refers to so-called 'TCS Teams' as described in Harvard Business Case 9-494-139, Harvard Business School, October 20th 1994.

[4] Study 3 aims exclusively at a verification of hypothesis *H2A* where Performance-related Data from a sub-sample are assumed to produce same results as those obtained from the Core Data sample. Consequently, no additional comparisons are made of elementary components obtained from the sub-sample and clusters of items from the Model of Motivation.

	Sampling date	n	N	Response	Company-type	Company-location	Company-profile	Company-marketpos.	
		Abs	Abs	%					
1 *Company XI*	*01-1997*	358	358	100.0%	*P*	*M*	*E*		(1)
2 *Company XII*	*04-1999*	134	157	85.4%	*P*	*NL*	*E*		(1)
	Totals	492	515	92.7%					

Notes:
(1) Sample consisted of Business Unit within larger company

Company-type: P=production, manufacturing-oriented, S=service-oriented
Company-location: NL=Europe, The Netherlands, M=South-East Asia, Malaysia
Company-profile, or 'life-cycle': S='starter' (< 5yrs) E= 'established' profile (> 5yrs)
Company-marketposition: D=Down-sizing

Table 5.5.
Summarized sampling characteristics of the Performance-related Data samples

Components obtained from the Core Data sample, are defined as follows:

- Component DEDICAT, consisting of items referenced as: ce, cf, cg, ci, cs, ct, dz and eb
- Component ACHIEV, consisting of items referenced as: at, au, av, ba, bb and bc

For a full description of references used in designating items, see Appendix III, Section B., or Table 5.3. for an abridged overview.

Components from both Higher and Lower Ranking Performers samples were obtained through PCA.

Analysis; The analysis was to proceed in two consecutive steps:

- An EFA, using PCA,
- and a comparative analysis.

The PCA as described in Chapter 5.4.1.1., was performed using oblique rotation, with direct oblimin, on the 83 variables comparable to those obtained in the Core Data sample. No further variables were omitted as the analysis was solely aimed at a comparative analysis.

The comparative analysis was performed using several measures of comparison, as described in Chapter 5.4.1.2. A measure of relative overlap was provided by indicating sensitivity and specificity. A measure for inferring an indication of strength and significance, was provided by Phi and symmetric Lambda coefficients.

2. Results

A Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was performed, with a .80 score for the Higher Ranking Performer sample, and a .58 score for the Lower Ranking Performer sample, indicating a less adequate representativity in the latter, as indicated earlier. For both samples a significant Bartlett's Test of Spherity ($p<.00001$) was obtained.

From the PCA 24 components for both the Higher and Lower Ranking Performer samples emerged with eigenvalues above 1.0. An average communality after extraction was obtained of .68 for the Higher and .74 for the Lower Ranking Performer samples. Inflexions of the scree plot justified isolating the first 4 components for the Higher Ranking Performer sample, and the first 3 for the Lower Ranking Performer sample, as indicated in Appendix XI, Fig. A and B., respectively[1].

A subsequent nonorthogonal rotation, using oblique rotation through direct oblimin, further reduced these components, following the rationale as indicated in Chapter 5.4.1.1. Appendix XII contains the 4 components for the Higher Ranking Performer sample as they emerged after rotation, and their respective items with component loadings as obtained from the pattern matrix, together with the internal consistency reliability estimates for each component. Appendix XIII contains the 3 components for the Lower Ranking Performer sample.

The comparative analysis between the elementary components DEDICAT and ACHIEV, obtained from the Core Data sample, and the components isolated in both Higher and Lower Ranking Performer samples was performed through parameters defined in Chapter 5.4.1.2., reproduced in Table 5.6.

Row 1 contains the parameters for a comparison between the Core Data items as obtained for component DEDICAT and those from component 1 from the Higher Ranking Performer sample. The data indicates there is a poor match between both clusters with a sensitivity of 37.5%. A match with the Lower Ranking Performer sample provides a better match, as indicated in row 2, although λ scores remain below a $p<.05$ significance level.

In a comparison between the Core Data sample and Higher and Lower Ranking Performer samples for component ACHIEV, however, a match is achieved in both cases with Φ and λ scores significant at $p<.05$, or even $p<.01$ for the Higher Ranking Performer sample, as indicated in rows 3 and 4 respectively.

[1] At this stage of the study no further distinctions were made in primary and secondary components.

	Component Comparison	Overlap % (2)	Sensitiv. % (3)	Specific. % (4)	Φ (5) (6)	Λ (7) (8)	
	Component DEDICAT						
1	Core Data versus Higher Ranking Perform.	37.5%	37.5%	96.0%	.382*	.000	(9)
2	Core Data versus Lower Ranking Perform.	75.0%	75.0%	97.3%	.723***	.500	
	Component ACHIEV						
3	Core Data versus Higher Ranking Perform.	100.0%	100.0%	100.0%	1.000***	1.000**	
4	Core Data versus Lower Ranking Perform.	83.3%	83.3%	100.0%	.907***	.818*	

Notes:
(1) Core Data Component DEDICAT consists of items ce, cf, cg, ci, cs, ct, dz and eb
Core Data Component ACHIEV consists of items at, au, av, ba, bb and bc
(2) Percentage overlap relative to Core Data sample
(3) Sensitivity is represented by the equation: TP/(TP + FN), where TP=True Positive Classification, FN=Fake Negative Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(4) Specificity is represented by the equation: TN/(FP + TN), where TN=True Negative Classification, FP=Fake Positive Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(5) Phi Coefficient
(6) * p < .05, ** p < .01, *** p < .001
(7) Guttman's Coefficient of Predictability Lambda
(8) * p < .05, ** p < .01, *** p < .001
(9) Level of significance could not be computed because the asymptotic standard error equals zero

Table 5.6.
Comparative Analysis Core Data sample and Performance-related Data; Components DEDICAT and ACHIEV; Measures not meeting criteria are shaded.

These results were evaluated according to standards provided Chapter 5.4.1.2. As a principle outcome, component DEDICAT was found not to meet criteria set; component ACHIEV, however, appeared to match the data in both Higher and Lower Ranking Performer samples. As a consequence, hypothesis H2A, where it was assumed that Performance-related Data would yield comparable components as those obtained from the Core Data sample, was only partly met.

3. Discussion

Limitations to the questionnaire, the resulting data-set and PCA extraction techniques were covered earlier in a Discussion, Chapter 5.5.1.3. Most important limitation, obviously, was the limited sample size of the Lower Ranking Performer sample. Nonetheless, both samples demonstrated a comparable component ACHIEV, indicating a similarity in importance of a Phase 3 of the Model. In both samples, a resulting DEDICAT component, produced divergent data, reflecting sharp differences in perceived support, as might be expected in both Performance-related Data samples.

An interesting avenue for future research would be to focus on these effects in additional data, especially from Lower Ranking Performers.

4. Conclusion

The results of the first comparative analysis, then, provide only partial support for the hypothesis that Performance-related Data would provide comparable outcomes as those obtained from the Core Data sample.

In both a Higher and Lower Ranking Performer setting, component ACHIEV, reflecting a personal self-evaluation in Phase 3 from the Model, seems an adequate construct. However, for component DEDICAT, reflecting experienced support from Reality in Phase 8, no such evidence was obtained.

5.6.2. Study 4: Culture-related Data

At the onset of the study, it was assumed that the Model of Motivation has a general stature. Findings that indicate that components DEDICAT and ACHIEV are the elementary constructs capturing the essence of the Process of Motivation, lead to assume that comparable results are to be obtained from samples taken from countries with a different cultural background than the European setting in which the Core Data was taken. In the next study, it is hypothesized that the outcomes of a series of samples from three locations world-wide with differing socio-economic and cultural backgrounds are assumed to yield comparable results to the ones obtained from the analysis of the Core Data.

A second analysis, then, will aim at a selection of so-called 'Culture-related Data' aimed at verification of H2B, with reference to Chapter 5.4.3.

1. Methodology

Sample; Three sets of samples, were taken, consisting of 8 companies in three different locations to draw up the Culture-related Data sample. In South-Africa, 3 companies were approached to participate, in the US 2 companies were approached, and in Malaysia 3 companies. From these 8 companies, 5 were approached by third parties and 3 by the researcher[1].

In order to provide internal consistency in the composition of the samples, only respondents from lower, middle and higher management were included; as such, respondents at dl-levels within the Malaysian sample were excluded.

A short description of participating companies, referred to as Company XIII to Company XX, is provided in Appendix X. Summarizing details are provided in Table 5.7.

[1] Thus conflicting with criteria originally set in Chapter 5.4.2.

		Sampling date	n	N	Response	Company-type	Company-location	Company-profile	Company-marketpos.	
			Abs	Abs	%					
	Malaysia									
1	*Company XIII*	*07-1997*	214	214	100.0%	*P*	*M*	*E*		(1)
2	*Company XIV*	*07-1997*	159	159	100.0%	*P*	*M*	*E*	*D*	(1)
3	*Company XV*	*01-1999*	140	140	100.0%	*P*	*M*	*E*		(1)
		Totals	513	513	100.0%					
	South-Africa									
4	*Company XVI*	*10-1998*	126	142	88.7%	*P*	*SA*	*E*		
5	*Company XVII*	*10-1998*	131	140	93.6%	*P*	*SA*	*E*		
6	*Company XVIII*	*10-1998*	149	160	93.1%	*P*	*SA*	*E*		
		Totals	406	442	91.8%					
	United States									
7	*Company XIX*	*06-1996*	171	174	98.3%	*S*	*US*	*E*		(1)
8	*Company XX*	*04-2002*	116	116	100.0%	*P*	*US*	*E*	*D*	(1)
		Totals	287	290	99.2%					

Notes:
(1) Sample consisted of Business Unit within larger company

Company-type: P=production, manufacturing-oriented, S=service-oriented
Company-location: M=Malaysia, SA=South-Africa, US=United States
Company-profile, or 'life-cycle': S='starter' (< 5yrs) E= 'established' profile (> 5yrs)
Company-marketposition: D=Down-sizing

Table 5.7.
Summarized sampling characteristics of the Culture-related Data samples

Procedure; At all locations, the HF-2.01 questionnaire was handed out in a classroom-setting. The procedure as described in Chapter 5.5.1.1. was followed at all locations. The questionnaire was translated and made available both in English and in Bahassa Malaysia at the Malaysian facilities, with translations in English, Kosa and Afrikaans at the South African facilities.

Measures; Given a presumed hypothesis *H2B* a comparison was to be made between the components obtained through PCA from the Core Data sample and those obtained from the Culture-related Data samples in the assumption that comparable data would emerge[1].

For a definition of components obtained through PCA from the Core Data sample, reference is made to Chapter 5.6.1.1.

[1] Study 4 aims exclusively at a verification of hypothesis *H2B* where Culture-related Data from a sub-sample are assumed to produce same results as those obtained from the Core Data sample. Consequently, no additional comparisons are made of elementary components obtained from the sub-sample and clusters of items from the Model of Motivation.

Components from the three sets of samples comprising the Culture-related Data sample were obtained through PCA.

Analysis; The analysis was to proceed in two consecutive steps:

- An EFA, using PCA,
- and a Comparative analysis.

A description of the PCA is provided in Chapter 5.4.1.1., and was performed on the 83 variables comparable to those obtained from the Core Data sample using oblique rotation, with direct oblimin. No further variables were omitted as the analysis was solely aimed at a comparative analysis.

The comparative analysis was performed using several measures of comparison, as described in Chapter 5.4.1.2.

2. Results

Only the sample size of the US data did not meet fully with standards set earlier. A Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was performed, ranging from .74 for the US data to .86 for the Malaysian data. For all samples a significant Bartlett's Test of Spherity ($p<.00001$) was obtained.

From the PCA 23 components emerged with eigenvalues above 1.0 for the Malaysian and South-African sample, 24 for the US data, explaining more than 65%, 68%, and 67% of the total variance in the respective data samples. An average communality after extraction was obtained of .66 for the Malaysian, .68 for the South-African and .67 for the US data samples. Inflexions of the scree plot justified isolating the first 3 components for the Malaysian, South-African and US samples, as indicated in Appendix XIV, Fig. A., B. and C., respectively[1].

Following the rationale as indicated in Chapter 5.4.1.1., a subsequent nonorthogonal rotation, using oblique rotation through direct oblimin, further reduced these components towards their essential attributes.

Appendix XV, Appendix XVI and Appendix XVII contain the 3 components for the Malaysian, South-African and US Data samples respectively, as they emerged after rotation, and their respective items with component loadings $\geq .400$ as obtained from the pattern matrix, together with the internal consistency reliability estimates for each component.

The comparative analysis between the elementary components DEDICAT and ACHIEV, obtained from the Core Data sample, and the components isolated in the three Culture-related Data samples, was performed according to criteria defined in Chapter 5.4.1.2., through parameters that appear in Table 5.8.

[1] No further distinctions were made in primary and secondary components.

Component Comparison	Overlap %	Sensitiv. %	Specific. %	Φ	Λ
(1)	(2)	(3)	(4)	(5) (6)	(7) (8)
Component DEDICAT					
1 Core Data versus Malaysian Data	75.0%	75.0%	100.0%	.855***	.714*
2 Core Data versus South-African Data	75.0%	75.0%	100.0%	.855***	.714*
3 Core Data versus US Data	87.5%	87.5%	98.7%	.862***	.750*
Component ACHIEV					
4 Core Data versus Malaysian Data	100.0%	100.0%	100.0%	1.000***	1.000*
5 Core Data versus South-African Data	100.0%	100.0%	100.0%	1.000***	1.000*
6 Core Data versus US Data	100.0%	100.0%	100.0%	1.000***	1.000*

Notes:
(1) Core Data Component DEDICAT consists of items ce, cf, cg, ci, cs, ct, dz and eb
Core Data Component ACHIEV consists of items at, au, av, ba, bb and bc
(2) Percentage overlap relative to Core Data sample
(3) Sensitivity is represented by the equation: TP/(TP + FN), where TP=True Positive Classification, FN=Fake Negative Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(4) Specificity is represented by the equation: TN/(FP + TN), where TN=True Negative Classification, FP=Fake Positive Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices
(5) Phi Coefficient
*(6) * p < .05, ** p < .01, *** p < .001*
(7) Guttman's Coefficient of Predictability Lambda
*(8) * p < .05, ** p < .01, *** p < .001*

Table 5.8.
Comparative Analysis Core Data sample and Culture-related Data;
Components DEDICAT and ACHIEV; Measures not meeting criteria are shaded.

A distinction is made in rows containing parameters for a comparison between the Core Data items as obtained for component DEDICAT and those for component ACHIEV. The data indicate there was a near complete match between component DEDICAT and a complete match between component ACHIEV and components that emerged from the PCA in all three samples. λ scores were significant at a $p<.05$ significance level, Φ scores at a $p<.001$.

Evaluating these results according to standards of Chapter 5.4.1.2., a principle outcome indicates support for hypothesis H2B, where it was assumed Culture-related Data would yield comparable components as those obtained from the Core Data sample.

3. Discussion

In parallel to earlier observations, limitations to the questionnaire, the resulting data-set and PCA extraction techniques, as well as sampling restrictions must be taken into account. In addition, it is stressed that besides the recurring components, other components emerged, especially after rotation for component DEDICAT, which were not accounted for in the Core Data results.

Nonetheless, the striking reoccurrence of components that were identified as being the essential constructs capturing Motivation within cultural settings that are traditionally considered as dramatically differing from one another, may open a discussion that these findings could suggest an unprecedented parallel in the way people are being motivated. Given the implications of such a conclusion, it is stated that future research is urgently needed to confirm and validate these outcomes.

4. Conclusion

The outcomes, then, of the second comparative analysis seem to provide support for hypothesis H2B, as formulated in Chapter 5.4.3., suggesting the concept of Motivation could be captured by components DEDICAT and ACHIEV, irrespective of socio-economic and cultural differences. These findings may suggest the Model of Motivation could provide a cross-cultural fundament for an inter-cultural understanding of the concept. Implications of these outcomes and observations justify elaborate subsequent research to further knowledge in this field.

5.6.3. Study 5: Company-related Data

A third and final analysis, then, will aim at a selection of so-called 'Company-related Data' aimed at a verification of H2C, with reference to Chapter 5.4.3.

1. Methodology

Sample; The Study was restricted to a selection of company-related characteristics as proposed in Chapter 5.4.2. Five sets of samples were taken from 18 companies that have been analyzed in the previous Studies 1 and 4[1]: A sample of Service-related companies, of Production-related companies, of so-called 'Starters' or companies having started operations within less than 18 months prior to the sampling date, versus so-called 'Established' companies that were operational for at least 5 years at the time of sampling, and finally, a sample of 'Downsizing' companies that were in a general status of reorganization for at least 6 months prior to the sampling date. To preserve an optimal distribution, sub-samples were to contain 3 to 4 unique companies, thus avoiding mutual overlap. Where sub-samples contained more than 4 companies, a random selection was made[2].

[1] Companies included in the Performance-related Data sample from Study 3 were not included to avoid bias as a result of the inherent selection of 'Higher-' and 'Lower Ranking Performers'.

[2] As a result, one company, Company XVIII was not contained in any sub-sample and therefore not included in the Company-related Data-set, thus bringing the total to 17 companies.

For a short description of participating companies reference is made to Appendix IV and Appendix X. An overview of samples is presented in Table 5.9.

Procedure; As indicated in Chapters 5.5.1.1. and 5.6.2.1., at all locations, the HF-2.01 questionnaire was handed out in a same classroom-setting, with the procedure as described in Chapter 5.5.1.1. followed at all locations.

Measures; Given a presumed hypothesis *H2C* a comparison was to be made between the components obtained through PCA from the Core Data sample and those obtained from these Company-related Data samples in the assumption that comparable data would emerge[1].

For a definition of components obtained through PCA from the Core Data sample, reference is made to Chapter 5.6.1.1.

Components from the Company-related Data samples were obtained through PCA.

Analysis; The analysis was to proceed along a same line of research as presented in Chapter 5.6.1.1. and Chapter 5.6.2.1.:

- An EFA, using PCA,
- a comparative analysis.

A description of the PCA is provided in Chapter 5.4.1.1. A PCA was performed on the same variables as those obtained previously in the Core Data sample using oblique rotation, with direct oblimin. No further variables were omitted as the analysis was solely aimed at a comparative analysis.

In the comparative analysis the procedure was followed as described in Chapter 5.4.1.2.

2. Results

The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) in the five data-sets ranged from .87 for the sample of 'Starter' companies to .80 for the Service-oriented companies sample. For all samples a significant Bartlett's Test of Spherity ($p<.00001$) was obtained.

[1] Study 5 aims exclusively at a verification of hypothesis *H2C* where Company-related Data from a sub-sample are assumed to produce same results as those obtained from the Core Data sample. Consequently, no additional comparisons are made of elementary components obtained from the sub-sample and clusters of items from the Model of Motivation.

		Sampling date	n	N	Response	Company-type	Company-location	Company-profile	Company-marketpos.	
			Abs	Abs	%					
	Service									
1	*Company III*	*07-1998*	44	44	100.0%	*S*	*NL*	*E*		(1)
2	*Company VII*	*02-2000*	69	78	88.5%	*S*	*NL*	*E*		
3	*Company X*	*12-2003*	274	324	84.6%	*S*	*NL*	*E*		
		Totals	387	446	91.0%					
	Production									
4	*Company XIII*	*07-1997*	214	214	100.0%	*P*	*M*	*E*		(1)
5	*Company XVI*	*10-1998*	126	142	88.7%	*P*	*SA*	*E*		
6	*Company XV*	*01-1999*	140	140	100.0%	*P*	*M*	*E*		(1)
		Totals	480	496	96.2%					
	Starters									
7	*Company I*	*02-1997*	55	55	100.0%	*P*	*NL*	*S*		
8	*Company II*	*09-1997*	515	572	90.0%	*P*	*NL*	*S*		
9	*Company IV*	*01-1999*	99	113	87.6%	*P*	*NL*	*S*		
		Totals	669	740	92.5%					
	Established									
10	*Company VI*	*12-1999*	62	71	87.3%	*P*	*NL*	*E*		
11	*Company VIII*	*11-2000*	104	107	97.2%	*P*	*NL*	*E*		(1)
12	*Company XVII*	*10-1998*	131	140	93.6%	*P*	*SA*	*E*		
13	*Company XIX*	*06-1996*	171	174	98.3%	*S*	*US*	*E*		(1)
		Totals	468	492	94.1%					
	Downsizing									
14	*Company V*	*11-1999*	151	202	74.8%	*P*	*NL*	*E*	*D*	(1)
15	*Company IX*	*02-2002*	176	176	100.0%	*P*	*NL*	*E*	*D*	(1)
16	*Company XIV*	*07-1997*	159	159	100.0%	*P*	*M*	*E*	*D*	(1)
17	*Company XX*	*04-2002*	116	116	100.0%	*P*	*US*	*E*	*D*	(1)
		Totals	602	653	93.7%					

Notes:
(1) Sample consisted of Business Unit within larger company

Company-type: P=production, manufacturing-oriented, S=service-oriented
Company-location: M=Malaysia, SA=South-Africa, US=United States
Company-profile, or 'life-cycle': S='starter' (< 5yrs) E= 'established' profile (> 5yrs)
Company-marketposition: D=Down-sizing

Table 5.9.
Summarized sampling characteristics of the Company-related Data samples

From the PCA 25 components emerged with eigenvalues above 1.0 for the Service-oriented companies sample explaining 68% of total variance, 24 for the Production-oriented companies sample, also explaining 68% of total variance, 22 for the sample of 'Starter' companies, 21 for the sample of 'Downsizing' companies, both explaining 63% of total variance and 23 components for the sample of 'Established' companies explaining 65% of total variance in the sample. The average communality obtained after extraction ranged from .63 for the sample of 'Starter' companies and the sample of 'Downsizing' companies, to .68 for both the Service- and Production-oriented companies samples. For the Production-oriented companies

sample, the sample of 'Starter' companies and the sample of 'Downsizing' companies, the inflexions of the scree plot justified isolating the first 3 components, and for both remaining samples, the first 4 components, as indicated in Appendix XVIII, Fig. B., C., E and A, D, respectively[1].

Referring to the rationale indicated in Chapter 5.4.1.1., a subsequent nonorthogonal rotation, using oblique rotation through direct oblimin, further reduced these components towards their essential attributes.

In five Appendices a report is provided of the components that emerged after rotation, visualizing the items with component loadings $\geq$.400 as obtained from the pattern matrix, together with the internal consistency reliability estimates for each component. Appendix XIX contains the PCA for the Service-oriented companies sample, Appendix XX the PCA for the Production-oriented companies sample, Appendix XXI the PCA for the sample of 'Starter' companies, Appendix XXII the sample of 'Established' companies, and, finally, Appendix XXIII the sample of 'Downsizing' companies.

The parameters reported in Table 5.10 provide the basis for the comparative analysis between the elementary components DEDICAT and ACHIEV obtained from the Core Data sample, and the components isolated in the five Company-related Data samples, as performed according to criteria defined in Chapter 5.4.1.2.

It appears that, as with the Culture-related Data samples, the Company-related Data samples provided a near perfect match between component DEDICAT as emerged from the Core Data sample and components that emerged from the PCA in all five samples. Φ scores were significant at $p<.001$, λ scores nearly all at a $p<.05$. A comparison between component ACHIEV as it emerged from the Core Data-set and components from the Company-related Data samples yielded comparable results with the exception of the Service-oriented companies sample.

Again, evaluating these results according to the standards proposed in Chapter 5.4.1.2., a principle outcome for the Company-related Data samples would support hypothesis H2C, where it was assumed that a selection of Company-related Data would yield comparable components as those obtained from the Core Data sample. An exception, however, was found in the Service-oriented companies Data sample, that failed to compare adequately to component ACHIEV.

[1] As in the previous study, no further distinctions were made in primary and secondary components.

	Component Comparison	Overlap	Sensitiv.	Specific.	Φ	Λ
		%	%	%		
	(1) (2)	(3)	(4)	(5)	(6) (7)	(8) (9)
	Component DEDICAT					
1	Core Data vs Type-related Data (Service)	75.0%	75.0%	98.7%	.782***	.600
2	Core Data vs Type-related Data (Production)	87.5%	87.5%	100.0%	.929***	.867*
3	Core Data vs Profile-related Data (Starters)	100.0%	100.0%	100.0%	1.000***	1.000**
4	Core Data vs Profile-related Data (Establ.)	100.0%	100.0%	98.7%	.937***	.882**
5	Core Data vs Market-related Data (Downs.)	87.5%	87.5%	100.0%	.929***	.867*
	Component ACHIEV					
6	Core Data vs Type-related Data (Service)	66.7%	66.7%	100.0%	.806***	.600
7	Core Data vs Type-related Data (Production)	100.0%	100.0%	100.0%	1.000***	1.000*
8	Core Data vs Profile-related Data (Starters)	83.3%	83.3%	100.0%	.907***	.818*
9	Core Data vs Profile-related Data (Establ.)	100.0%	100.0%	100.0%	1.000***	1.000*
10	Core Data vs Market-related Data (Downs.)	100.0%	100.0%	100.0%	1.000***	1.000*

Notes:
(1) Core Data Component DEDICAT consists of items ce, cf, cg, ci, cs, ct, dz and eb
Core Data Component ACHIEV consists of items at, au, av, ba, bb and bc
(2) Service=Service-oriented companies, Production=Production-oriented companies, Starter=Starting companies, Establ.=Established companies, Downs.=Downsizing companies
(3) Percentage overlap relative to Core Data sample
(4) Sensitivity is represented by the equation: TP/(TP + FN), where TP=True Positive Classification, FN=Fake Negative Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices, note 3
(5) Specificity is represented by the equation: TN/(FP + TN), where TN=True Negative Classification, FP=Fake Positive Classification. See Chapter 5.4.1.2 Comparative Analysis of Matrices, note 3
(6) Phi Coefficient
*(7) * p < .05, ** p < .01, *** p < .001*
(8) Guttman's Coefficient of Predictability Lambda
*(9) * p < .05, ** p < .01, *** p < .001*

Table 5.10.
Comparative Analysis Core Data sample and Company-related Data;
Components DEDICAT and ACHIEV; Measures not meeting criteria are shaded.

3. Discussion

Limitations to the questionnaire, the resulting data-set and PCA extraction techniques were mentioned earlier especially in Chapter 5.5.1.3. In addition, however, it is stressed that to avoid excessive data sampling, the subset was generated from available samples. Reoccurrence of components could have originated from this reallocation, although special attention was given to diversify samples, and samples were made to adequately represent company-related characteristics.

Furthermore, only a limited number of company-related characteristics have been observed. Future research must include a wide variety of characteristics with observations in a diverse range of company settings.

In addition to these restrictions, again, it is noted that as the research was primarily focused on a business related environment, no further sample characteristics, e.g. gender, age, socio-economic background, were observed. It is suggested that future research will include those parameters as an additional verification of findings.

4. Conclusion

In a comparative analysis, a selection was made of company-related characteristics in the assumption that results would be comparable for all characteristics, as mentioned in Chapter5.4.2. Outcomes of this third analysis follow a same pattern as previous conclusions and provide support for hypothesis H2C, as formulated in Chapter 5.4.3., that the concept of Motivation seems to be captured by components DEDICAT and ACHIEV, irrespective of company-related differences.

5.6.4. *Conclusions*

Given the assumption that the Process of Motivation as captured by the Model, has a general stature and is therefore applicable within any given population, it was hypothesized that the outcomes of a series of three additional representative samples would yield comparable results to those obtained from the Core Data sample, where components DEDICAT and ACHIEV were isolated as being the elementary constructs capturing the Process of Motivation.

In a first comparative analysis, Chapter 5.6.1., it was found that results provided only partial support for hypothesis H2A, as formulated in Chapter 5.4.3., where it was assumed that the components obtained from the Performance-related Data sample would yield comparable items as those obtained from the Core Data sample.

A second comparative analysis, Chapter 5.6.2., provided substantial evidence for hypothesis H2B, formulated Chapter 5.4.3., where it was assumed that components obtained from a selection of Culture-related Data from three different locations world-wide would yield comparable items as those obtained from the Core Data sample. Findings suggested the Model of Motivation could provide a cross-cultural fundament for an inter-cultural understanding of the concept.

Outcomes of a third analysis, Chapter 5.6.3., followed a same pattern as previous conclusions and provided substantial evidence for hypothesis H2C, Chapter 5.4.3., where it was assumed that components obtained from a Company-related Data sample would yield comparable results as those obtained from the Core Data sample.

Given hypotheses H2A, H2B and H2C have been substantially met, it is assumed, following Chapter 5.4.3., that the concept of Motivation has been adequately captured, and from the analysis the elementary constructs from the Model have emerged that represent the Process of Motivation, as indicated by our Problem Statement, Chapter 2.5.

These conclusions justify an additional and final study as initially proposed in Chapter 5.4.3. where it was suggested, following a confirmation of hypotheses, that a further reduction would be justified into distinct factor scores for each relevant component, thus enabling a quantification of the concept of Motivation for subsequent research..

5.7. Empirical Research
Factor Scoring

5.7.1. Study 6: Core Data Generated Factor Scores

Factor scores reflect and capture in a single score the outcomes of the rotation process in terms of the components that were generated. Factor scores can be used in the subsequent analyses to represent the values of the components, i.e. components DEDICAT and ACHIEV, which were found to represent the Process of Motivation as its elementary constructs. Thus, assigning a factor score per subject for the components DEDICAT and ACHIEV, provides a means to quantify and capture Motivation for each individual subject, enabling a further analysis of Conditions affecting Motivation in Chapter 6, and indirectly of Competencies initiating these Conditions in Chapter 7 and Instruments assisting in evoking these critical Determinants in Chapter 8.

The sixth and final Study in this Chapter, then, is aimed at defining a suitable course of action in generating the factor scores in these subsequent analyses.

1. Methodology

In capturing Motivation through factor scores, a number of considerations are to be taken into account.

As indicated Chapter 5.4.1.3., to avoid the influences of differences in scales of measurement used on the items in the questionnaire, factor score coefficients are used rather than factor loadings as weights in the final equations generating the factor scores. The specific combination of factor score coefficients are used as weights to provide for each item a score quantifying its specific contribution on the final component. Each component has its specific signature reflected in this series of factor score coefficients per item. As such, computing a factor score with these ingredients captures the essence of the component it represents.

Given the outcomes of the study where components DEDICAT and ACHIEV emerge as being the elementary components capturing Motivation, *both components are to express Motivation in a two-fold score. As a consequence, in empirical research in Chapters 6, 7 and 8, a distinction will be made in both factor scores in the various analyses.*

Finally, in the stepwise approximation of factor scores towards a final score, a number of considerations are to be made in the extrapolation of factor scores from the ones obtained from the Core Data sample towards a given sample.

Factor scores are calculated in three steps:

- *Missing values replacement by mean estimates;* As all items are involved in setting up a factor score, missing items affect the outcomes of a final score. When factor scores are required for each subject in a sample, the usual procedure is two-fold:

- Either to replace missing values by the mean of the specific sample,
- ... or to replace missing values by the mean of the entire series, i.e. Core Data and specific sample. *The subsequent empirical research will follow the option of the series mean, i.e. Core Data and specific sample, instead of only the sample mean to avoid irregularities especially in smaller samples.*

- *Z scores;* In order to avoid the influences of differences in scales of measurement used on the items in the questionnaire Z scores are used. Two options in deriving the z score:
  - Either using the specific sample mean,
  - ... or to use the mean of the entire series, i.e. a summative series of Core Data and specific sample[1]. *The subsequent empirical research will make use of a mean from a summative data-set consisting of Core Data and specific sample, to avoid detrimental effects of generating z scores based on highly divergent data especially in small samples, and to provide an adequate basis for correctly expressing divergence in data as related to their respective factor score coefficients.*
- *Factor scores;* Factor score coefficients are used as weights in the final equations. Two options emerge in practice:
  - Usually, the current practice of using a general data-set together with a specific sample in replacing missing values and generating z scores, also leads to having factor scores being generated by the combined data-sets. This, however, affects the integrity of the factor score coefficients, as these are also influenced by the scores from the specific sample, especially when this added sample tends to be large.
  - *In order to preserve the integrity of the factor score coefficients generated by the Core Data sample, subsequent empirical research will only use the coefficients as generated by the Core Data sample, and will compute factor scores for the specific data samples based on these original factor score coefficients*[2].

[1] Arguably, the option to use a Core Data generated mean instead of a summative series of Core Data and specific sample mean would be more suitable in computing a factor score. The option, however, seems not available on current statistical software.

[2] Factor scores will be generated using a standard procedural SPSS computation. It is noted however, that, as a result, factor scores will be generated on all items, whereas, preferably, a choice should be made whether to include only the items clustered *and mentioned* in both components DEDICAT and ACHIEV as weights in the equations, or to include also the coefficients of remaining items. A choice to include all items is considered correct as it provides an optimal expression of the underlying dimension captured in both components, with substantial weight given to the specific items mentioned for both components. Moreover, as a selection of these items is dependent on criteria used earlier to interpret only items with factor loadings greater than .40, these criteria would indirectly affect a factor score selection. To avoid a possible divergence in rationale behind an adequate choice in constituting component items and an adequate representation by means of factor scores, no further item selection is made and all items are included in a final factor score computation.

2. Discussion

Factor score coefficients, then, are generated using the Core Data sample as a 'blue-print' for other samples to compile and express Motivation from, in a two-fold score.

A number of closing observations must be made prior to applying these factor scores to the data in the different studies.

First, in replacing missing values, and in defining z scores, specific samples will be analyzed in conjunction to the Core Data sample, in a summative data-set. In defining the final factor scores, the factor score coefficients as generated from the Core Data sample will be used, resulting in a factor score that preserves the original signature of the Data-set that was found to have captured the Process of Motivation in its elementary concepts, as suggested by the subsequent studies.

Second, as the factor scores are generated from factor score coefficients, and standardization of scores leads to negative and positive values in resulting scores, in coming analyses the factor scores may lead to scores that may not follow an intuitive positive to negative, but rather a negative to positive profile, in reflecting a progressive course, especially when, in Chapter 8, results are being visualized.

And third, as the sample size affects the resulting factor scores when Core Data and specific samples are merged in the computation process, a specific sample size is to be restricted in accordance with the sample size of the Core Data sample.

5.7.2. *Conclusions*

The process of Motivation has been captured in its elementary components DEDICAT and ACHIEV, which were found to reflect the two most important Phases in the Model of Motivation as described in Chapter 3.3.4.

Both components will be represented in their respective factor scores, enabling a quantification of the concept of Motivation.

Factor scores are to be computed in three consecutive steps:

- *Missing values; Empirical research will follow the option to replace missing values by the mean of the entire series, i.e. Core Data and research sample.*
- *Z scores; Empirical research will make use of Z scores derived from the mean from the summative data-set consisting of Core Data and research sample.*
- *Factor scores; In order to preserve the integrity of the factor score coefficients generated by the Core Data sample, empirical research will only use the coefficients as generated by the Core Data sample, and will compute factor scores for the specific data samples based on these original factor score coefficients.*

5.8. Summary

Motivation in its essential form was found in Chapter 3.3.4. to be represented by Phases 3 and 8 in the Model of Motivation. Chapter 5 was to provide evidence of elementary constructs from the Model, in terms of components and their respective items, capturing the Process of Motivation. In matching elements obtained in a statistical reduction of the data-set with those suggested by the Model, empirical evidence would be obtained in support of the Model of Motivation.

The analysis in Chapter 5 has progressed along two successive lines. The first line consisted of a Data Reduction in Study 1, Chapter 5.5.1. aimed at providing evidence of elementary constructs, that captured the Process of Motivation in its essence, while preserving its original signature. The Model of Motivation, in its distinct Phases, was operationalized through a questionnaire HF-2.01, consisting initially of 93 questions. Data reduction on the data-set was obtained through Principal Component Analysis (PCA), resulting in 83 remaining items. In the extraction phase of the analysis, the data-set of questions was limited to components with highest eigenvalues, designated as 'initial components', accounting for a substantial variance and thus providing an adequate description of the data-set. In a subsequent non-orthogonal rotation phase these extracted initial components were further reduced towards components that were considered to be a reduced reflection of the original initial components. These resulting components were designated as 'elementary components', which, through rotation, were considered to have preserved their original signature, as rotation has the effect of optimizing the underlying component structure.

In a second line, Study 2, Chapter 5.5.2., a Model Comparison was performed. Isolated components were compared through analysis to the essential Phases of the Model of Motivation, Phases 3 and 8, as proposed in Chapter 3.3.4. A perfect match was obtained between two primary components, designated as 'DEDICAT" and 'ACHIEV', yielding significance levels as expressed in both Phi and Lambda coefficients.

It was assumed that the Model of Motivation would be universally applicable and that differences in performance-, or culture-, or specific company-related characteristics would yield a same set of components, within limitations set to sampling within a quasi-experimental setting. A first comparative analysis, Study 3, Chapter 5.6.1., on so-called 'Performance-related Data' provided only partial support for these assumptions. A second comparative analysis, Study 4, Chapter 5.6.2., on 'Culture-related Data' from three different locations world-wide, provided substantial evidence in support of these assumptions, suggesting the Model of Motivation could provide a cross-cultural fundament for an inter-cultural understanding of the concept. A third analysis in Study 5, Chapter 5.6.3. performed on 'Company-related Data' produced comparable results.

Following the Problem Statement defined in Chapter 2.5., the empirical research provided evidence, then, that components DEDICAT and ACHIEV as obtained from the analysis, were indicative of Phases 3 and 8 of the Model of Motivation, and were the elementary constructs that capture the Process of Motivation, thus providing first empirical evidence in support of the Model of Motivation.

Chapter 6
Empirical Research
Conditions for Intervention in the Process of Motivation

6.1. Introduction

Elementary constructs have been isolated, capturing the concept of Motivation and providing support for a Model of Motivation that was assumed to represent the Process of Motivation.

Following initial observations in Chapter 1.5., additional hypotheses derived from this explanatory theoretical Model, are to be tested through empirical research, thus reflecting on the robustness of the Model. As observed, multiple hypotheses, within multiple empirical studies, derived from the explanatory Model were assumed to provide further evidence and add to its authority.

As stated Chapter 2.4.2., the Problem Statement not only called for insights into the Process of Motivation, but also into the Process of Interference and its elementary Determinants. As these Determinants were theoretically derived from the Model of Motivation, empirical research on hypotheses associated to each Determinant would provide not only insights into the Process of Interference, but would present also a means of verification reflecting on the robustness of the theoretical Model.

In Chapter 2.3.1. the Process of Interference was assumed to consist of three Determinants: Conditions, Competencies and Instruments. Chapter 6, then, is to provide an exploratory and descriptive correlational evidence for the first of these Determinants: the Conditions for intervention in the Process of Motivation. Empirical research on its associated hypotheses would constitute a first supplemental verification of the Model.

The objective of Chapter 6 is derived from the Problem Statement defined in Chapter 2.5.:

- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
  - *into the Conditions necessary for effects to occur within the Process of Motivation, by means of:*
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
    - *and exploratory and descriptive empirical research providing evidence of the relation between the isolated constructs operationalizing the Process of Motivation and concepts presumed to be indicative of these Conditions,*
      thus providing secondary empirical evidence in support of the Model of Motivation, from which these Conditions are derived.

6.2. Application of the Model of Motivation *An Analysis of Conditions*

Following the introduction of an explanatory theoretical Model of Motivation in Chapter 3., a next step aimed at addressing Motivation. As assumed initially in Chapter 2., this Process of Interference was to be initiated by so-called 'Conditions'.

Before proceeding towards the empirical research, a brief presentation is provided of a theoretical Model on Conditions based on the Model of Motivation, in accordance with the Problem Statement. Reference is made to Mennes (2016, *in press*), notably Chapter 6, for an extensive overview.

A brief description of Assumptions precedes the analysis.

6.2.1. Assumptions Preceding an Analysis of Conditions

In the inductive inference leading to the identification of Conditions, a theoretical inventory was made of all possible manifestations in which a Process of Interference could intervene in the Process of Motivation. Referring to Appendix XXIV, Section A., a series of Assumptions were made, where these 'Interventions' in Motivation were assumed to occur in 8 variations and within 8 so-called 'Contexts', thereby reducing the vast universe of possible options in which a Process of Interference could intervene in a Process of Motivation, to a matrix of 8x8 manifestations, defined as so-called 'Intervention Strategies'.

6.2.2. An Analysis of Conditions

From an analysis of this reduced representation of the Process of Interference in its 8x8 manifestations of possible Intervention Strategies, emerged three distinct Conditions. These three Conditions were later, after performing empirical research following the analysis, refined and finalized to four Conditions that are assumed to be essential in addressing Motivation:

- Perceived Significance of the Goal, or objective
- Perceived Significance of the Actor-Intervener
- Perceived Support
- Perceived (Mis)-Match in Mutual Perceptions

For further details on the inductive analysis leading to the identification of the Conditions, reference is made to an abbreviated overview in Appendix XXIV, Section B.

Within the interplay of these Conditions, a recurrent pattern and algorithm was observed, that appeared to dramatically simplify an analysis of effects of the Process of Interference on the Process of Motivation.

The algorithm revealed the 8x8 matrix of Intervention Strategies, which conceptualized the Process of Interference in its variety of manifestations, could be divided in two antagonistic approaches. These two basic approaches in addressing, or 'Management' of Motivation were defined as two principal 'Modalities' in Management of Motivation.

- An 'Extrinsic' Modality, consisting of four distinct levels of Intervention;
- An 'Intrinsic' Modality, consisting of four distinct levels of Intervention.

Both Modalities were to define a subsequent analysis of Competencies, essential in Management of Motivation, and are further elaborated on in Chapter 7.

6.2.3. *Conclusions*
Preamble to a Definition of Hypotheses

In Pre-Fundamentals to the study, it is assumed the Model obtained in an analysis of Conditions, as derived from the Model of Motivation, provides an explanatory context from which elementary hypotheses can be derived.

In concluding the analysis of Conditions, four have been identified as essential. These essential constructs, then, are to be elementary in the formulation of those hypotheses, and are to be contained in a definition of hypotheses provided in Chapter 6.4.3.

In a verification of these Conditions, empirical research on these hypotheses is to reflect on the Model of Motivation, from which these Conditions are derived.

6.3. Operationalization

This Chapter seeks to provide evidence of the relation between concepts operationalizing the Process of Motivation and concepts that are thought to be expressions of the four Conditions assumed to be necessary for an Intervention to occur.

Concepts operationalizing Motivation were defined earlier in Chapter 5 as the factor scores summarizing components DEDICAT and ACHIEV that were found to capture the Motivation in its essential form.

In defining concepts that are indicative of the four Conditions, the empirical research is to be aimed at providing an inventory of all so-called 'Elements' within the settings of a business environment, and at operationalizing these Elements into quantifiable variables by means of a questionnaire, enabling a comparative analysis. For an overview of the operationalization, reference is made to Mennes (2016, *in press*), notably Chapter 8.3.

6.4. Research Design

As a result, this Chapter, in its essence, seeks to explain variance in a set of variables that are assumed to be indicative of all Elements within a business environment that could affect an Intervention and its effects on Motivation, as captured in factors scores isolated earlier.

The empirical research will progress in three phases:

- *A first phase consists of operationalizing all Elements that could affect Intervention within the settings of a business environment and translating these into quantifiable variables, resulting in a questionnaire;*
- *A second phase consists of determining which of these variables reveal a relationship with Motivation, operationalized in factor scores representing DEDICAT and ACHIEV as provided through a questionnaire;*
- *Followed by a third phase determining if these correlated variables are indicative of the Conditions presumed necessary for an Intervention to occur, by providing an explanatory context based on these Conditions.*

If the assumptions derived from the Process of Motivation, hold true, then all Elements within an experimental setting of a business environment displaying a correlation with Motivation are assumed to be directly or indirectly related to one or more of these enabling Conditions, hence can be explained in terms of one or more of these Conditions.

For a full overview and rationale of the research design, reference is made to Mennes (2016, in press), notably Chapter 8.4.

6.4.1. Statistics

Following this rationale, a three-fold approach in the statistical analysis will be followed:

- Establishing a complete overview of Elements within a business environment that could affect an Intervention by an external Actor-Intervener;
- Establishing a relationship by means of correlation coefficients;
- Establishing criteria for adequacy of an explanatory context.

1. Exploratory Panels, In-company Research, Literature

To generate a complete overview of Elements within a business environment that could affect an Intervention, techniques of generating the highest possible information are to be used. To this aim a combination of interviews and inventories provided through literature will be used.

In the interviews a panel-approach is to be used as a means to generate the highest possible output, with panel-members exchanging information and generating diversity in views (Samanta, 1993; Sharma & Chandra, 2003), thus generating pluriform data. Participants that have extensive knowledge of a business environment are to participate. To avoid bias, third parties will be involved both in conducting the interviews and in the analysis of output.

Data generated by these panel-interviews are to be supplemented by findings through additional, in-company research and from literature, in an analysis to be held through third parties, resulting in a so-called 'Inventory of Elements'.

2. Correlational Analyses

In establishing an indication of relationships between Elements and Motivation, questionnaires are used. Elements are represented in a questionnaire based on the Inventory of Elements. Motivation is to be captured using factor scores, associated with components DEDICAT and ACHIEV, as described briefly in Chapter 5.5.3. Factor scores are to be defined following the methodology described in Chapter 5.7.1.1. and summarized in Chapter 5.7.2.

A relationship between Elements and Motivation is analyzed by means of a Pearson product-moment correlation coefficient *r* (Howell, 2002). However, as data is expected to be non-normally distributed, Spearman's non-parametric correlation is to be analyzed in addition to the standard correlation (Siegel & Castellan, 1988)[1].

Standards from literature are followed in establishing the size of observed effects, i.e. with $\pm$ .3 defined as 'medium' and $\pm$ .5 as 'large', correlations starting from a $\pm$ .300 range will be considered valid as indicator in defining a relationship (Cohen, 1988; Cohen, 1992). In addition scores must be significant at $p<.001$, two-tailed, thus reducing a chance occurrence in coefficients. Again, it is stressed at this point that strength in effect is no indication of a causal relation. No causality can be established through correlations alone, referring to the tertium quid theorem (Field, 2005), and the absence of an adequate indication of direction in correlation coefficients (Gould, 1981).

All assessments are to be made using standard SPSS procedures (Norusis, 1990).

3. Adequacy of Explanatory Context

In exploratory correlational research a phenomenon can occur that is associated to so-called 'data-dredging': the incidence of significant correlations occurring in data as a result of random-effects (Selvin & Stuart, 1966). As a consequence of these randomly-generated significant correlations, not all observations are expected to be

[1] Spearman's correlation coefficient is preferred to Kendall's Tau in larger data-sets (Field, 2005).

accounted for by the Conditions as defined in Chapter 6.2.2. As research and literature on the extent of these random occurrences seems to be lacking at present, a rough estimate is set at 20%. As a consequence, it is assumed at least 80% of all items correlating $\geq \pm .300$ with factor scores representing Motivation must be accounted for by one or more of the four Conditions, in providing an adequate explanatory context for the observed relation.

To avoid bias, third parties are to establish the relations between a specific item and one or more Conditions. To this end, independent observers will be approached ad random. Assessments are to be made anonymously by at least 5 observers.

Where these ad random observers are to define a match, a criterion for congruency is set at ¾: *an item is considered indicative of a specific Condition when a relation is assumed to be plausible by ¾ of observers.*

6.4.2. Sampling

Following the observations made in Chapter 2.4.3.3., a business environment is chosen to conduct the research in. Companies are to be included in the research that were approached earlier in the empirical research from Chapter 5 by third parties, not directly related to the researcher.

The final sample will include a randomized selection from all 22 companies participating in the empirical research of this dissertation, including different geographical locations, with at least 1 random sample per location. Findings are to differentiate between a total population and the respective geographical locations to avoid bias. As a result, from a total of 22 companies approached in four differing locations, the sample will focus on obtaining data from at least 4 companies.

As an indication for an adequate sample size, within limitations due to the extensive nature of the questionnaire, it is suggested to set no limitations to the size of sampling in each sub-sample order to generate adequate response from companies that are to be approached. As such, the total data-set is to be observed primarily for the correlational analyses, with results reported for the various sub-samples only to assess integrity. For the total data-set a standard procedure for defining sample size is used, with $n > 177$ defined as an adequate sample size for a first investigative study (Cohen, 1988)[1].

Summarizing, a set of samples will be analyzed in this Study, consisting of at least 4 samples from those obtained in the previous Studies contained in Chapter 5, within four distinct geographical locations, consisting in total of at least n=177. For an adequate sampling to occur, we are to follow previously defined criteria where a response of companies approached must exceed 70%, and a subsequent sampling must reach at least 70% respondents on average.

[1] with $\alpha = .05$, and $1-\beta = .8$ to detect a $r = .300$.

6.4.3. Hypotheses

A set of samples is to generate data that will provide insights in the Elements within a business environment that are assumed to reveal a relation to Motivation.

An important observation is to precede the formulation of hypotheses.

Although Conditions are assumed to affect both components DEDICAT and ACHIEV that are to capture Motivation, it is hypothesized that a difference will occur in the extent at which both components are affected. Conditions are expected to have a different effect on Phases 1, 2 and 3, and consequently component ACHIEV capturing Phase 3, than they would have in Phases 5, 6, 7 and 8, especially affecting component DEDICAT capturing Phase 8. Both components are associated to the outcomes of both series of Phases. As described more extensively especially in Chapter 3.3.2., it was assumed that external influences would affect Phases 5, 6 and 7 to a greater extent than they would affect Phases 1, 2 and 3 as these Phases would only be influenced in a subsequent cycle following Phase 8, and protective Mechanisms of Anticipation, Representation and Coping would neutralize external influences. As a consequence, within the Process of Interference between an intervening Actor-Intervener and the Individual, Conditions are assumed to affect ACHIEV to a lesser extent than DEDICAT, resulting in expected higher correlations between Elements indicative of these Conditions and DEDICAT than expected correlations between those Elements and ACHIEV.

Anticipating a differing impact of Conditions on components DEDICAT and ACHIEV representing the concept of Motivation, is expressed in the hypotheses that are to be formulated. However, as there is no theoretical ground for providing a quantitative indication of this assumed difference, in formulating an appropriate hypothesis an unconventional phrasing will be used suggesting a 'considerable higher proportion' of Elements to be associated with DEDICAT.

Following hypotheses, then, are to be met to provide a confirmation for an assumed relation between Motivation and Conditions enabling Intervention, in a first exploratory and descriptive research of the processes involved in addressing Motivation, as indicated in the Problem Statement:

- *Given that a set of concepts can be defined within a business environment that is to contain all aspects, or 'Elements', that could possibly affect an Intervention,*
- *... with these Elements within a business environment assumed to be captured through a questionnaire, thus enabling a quantification of effects,*
- *... and with the Process of Motivation assumed to be captured by factor score components DEDICAT and ACHIEV,*
  following hypotheses are formulated:
  - *Hypothesis 1 (H1): It is hypothesized that a number of these Elements within an experimental setting of a business environment will display a correlation with components DEDICAT or ACHIEV, represented by their respective factor scores.*

- *Hypothesis 2 (H2): It is hypothesized that from these Elements displaying a correlation with components DEDICAT and ACHIEV, a 'considerable higher proportion' of Elements, will display a correlation with component DEDICAT, than with component ACHIEV.*
- *Given these proportional differences, two additional hypotheses apply:*
  a) *Hypothesis 3A (H3A): It is hypothesized that from these Elements within an experimental setting of a business environment displaying a correlation with component DEDICAT, a majority of at least 80% will be directly or indirectly related to one or more of so-called enabling 'Conditions', hence can be explained in terms of one or more of these Conditions.*
  b) *Hypothesis 3B (H3B): It is hypothesized that from these Elements within an experimental setting of a business environment displaying a correlation with component ACHIEV, a majority of at least 80% will be directly or indirectly related to one or more of so-called enabling 'Conditions', hence can be explained in terms of one or more of these Conditions.*

Given the observations made on components DEDICAT and ACHIEV, when hypotheses H1 and H2 are met, in addition to, at least, hypothesis H3A, it is assumed that a correlational evidence will have been provided between concepts capturing Motivation and the Conditions enabling an adequate Intervention within the Process of Motivation to occur, as indicated by the Problem Statement, Chapter 2.5.

A confirmation of these hypotheses will provide secondary empirical evidence in support of the Model of Motivation, from which these Conditions are derived.

6.4.4. *Conclusions*

A set of samples is to provide insights into the Conditions necessary for an Intervention to occur by means of empirical research providing an exploratory and descriptive evidence of the relation between concepts operationalizing the Process of Motivation and concepts presumed to be indicative of these Conditions.

In a successive approach a complete overview of Elements within a business environment, is to be made, followed by a descriptive correlational analysis, leading to an explanatory context by means of the four Conditions.

Summarizing, then, a following research design is proposed:

- *Study 7: Exploratory Research: Inventory of Elements*
- *Study 8: Descriptive Correlational Research: aimed at verification of H1, H2*
- *Study 9: Enabling Conditions: aimed at verification of H3A, H3B*

6.5. Empirical Research

6.5.1. Study 7: Inventory of Elements

The Study is aimed at generating an Inventory of all aspects, or so-called 'Elements' within, or related to a business environment to provide input for subsequent correlational research, aimed at verification of H1 and H2 in Chapter 6.5.2., H3A and H3B in Chapter 6.5.3.

1. Methodology

Sample; Following observations made in Chapter 6.4.1.1., a combination of panel-interviews supplemented by inventories through in-company research and literature were used.

A total of seven panel-interviews were held with three groups of participants:

- 2 Groups consisting of students in business and economics
- 3 Groups consisting of a mix of business consultants and middle managers
- 1 Group consisting of university lecturers in business and economics
- 1 Group consisting of middle managers

Procedure; All panels were held in The Netherlands at a polytechnic university, Hogeschool Brabant, at Breda in the spring of 1996. Participants were personally approached ad random by university students from Erasmus University, Rotterdam, The Netherlands, from lists provided by the researcher and supplied both by Hogeschool Brabant and Erasmus University, yielding a response in excess of 85%, with each panel consisting of 12 – 15 participants.

All groups were asked to generate input on the question: "if you were to describe a business environment, which Elements come to mind?".

Input from panels were recorded on tape during 60 – 90 mn sessions. Sessions were held until no further Elements were generated by the group[1].

Analysis; Tapes were then analyzed by teams of four students from Erasmus University, resulting in an inventory of items for each panel. In addition, each panel was reviewed twice by a second team of students. All items generated by the seven panels were then merged into a final database of Elements.

These Elements, in turn, were compared to so-called 'satisfaction questionnaires' obtained from European companies through the assistance of the European Foundation for Quality Management (EFQM), located in Brussels, Belgium.

[1] A number of additional questions were formulated at the end of sessions, relating to different topics, namely Motivation in general, and change management.

A final comparison was made with items presented in the literature, both from descriptive models and from available inventory lists.

2. Results

I. Inventory of Elements

From the seven panel-interviews, a substantial number of Elements were generated, when merged into an overall Inventory of Elements following the analysis of recordings. In a subsequent comparison with satisfaction questionnaires through the EFQM, a total of 40 companies provided their questionnaires, resulting in 10 additional items to the Inventory of Elements.

An overview of participating companies in the analysis of satisfaction questionnaires is provided in Appendix XXV. Referring to Appendix XXVI, following an analysis of the literature, comparing descriptive models and available inventory lists, a final list of Elements was compiled.

The Inventory of Elements produced a list containing 482 Elements, a total overview of which is provided Appendix XXVII.

II. Questionnaire

In a next step, a four-fold, stepwise abbreviation could be obtained in the extensive list of 482 Elements. First, all Elements directly related to a status quo of Motivation were eliminated, as these Elements were considered indicative of the Process of Motivation itself, or Stages within the Process. These Elements were used to operationalize the concept the subsequent correlational analysis was aimed at, following the Problem Statement set forth in Chapter 2.5. Thus, a first abbreviation consisted of an extensive reduction of the listing with 102 Elements, resulting in 380 Elements remaining[1].

A second abbreviation was obtained by omitting all Elements aimed at so-called 'generalizations', or generalized perceptions of subjects. A sample of subjects addressed with questions containing only generalized perceptions would generate inconsistent data, capturing a perception of what is believed to be a general consensus among subjects. Instead, addressing subjects with questions containing personal perceptions will provide an adequate and correct database with personal perceptions, thus generating the very data the subject is asked to evaluate in

[1] Referring to Appendix XXVII, these Elements, clustered under 1.5., 2.5. and 2.6., were omitted from the list.

subjective terms using a generalized perception format[1]. This second abbreviation involved 56 Elements, thus, with a reduced set of 324 questions remaining, 380 Elements could be covered[2].

A third abbreviation aimed at covering Elements that revealed an overlap or redundancy in covering the different aspects of a business environment. These Elements included policymaking and plans, or subjective perceptions versus actual status of Elements. As these diversifications would not lead to different outcomes with respect to the Problem Statement, multiple Elements could be covered by single questions, resulting in a dramatic reduction of the final survey. This reduction, involving a total of 135 Elements, enabled a further abbreviation of the questionnaire with a final listing of 189 questions covering a total of 380 Elements[3].

A fourth, and final step was aimed at eliminating Elements involving interactions between individuals that were not clearly identified, and referred to as so-called 'unspecified interactions'. The cluster of Elements referring to these unspecified interactions was considered redundant, as these were already covered by clusters of so-called 'specified interactions'. With this final reduction, covering a total of 28 Elements, a further abbreviation was achieved with a total listing of 161 questions remaining, covering a total of 380 Elements[4].

In a subsequent stage, the 161 questions were formulated covering these 380 Elements and supplemented by a number of accompanying questions. At this point, an essential choice was made on a guiding principle in phrasing of questions: the respondent was asked to evaluate each Element on its status quo, i.e. in terms of a qualification, or perceived satisfaction, providing a phrasing that would cover the

[1] Thus, a generalized perception of a subject (e.g.: "I believe *the majority of employees* favors the approach management is taking in this issue"), is to be replaced by a personalized perception (e.g.: "*I personally* favor the approach management is taking in this issue"), in order to obtain adequate data. Thus, the clustered data obtained from personalized perceptions from subjects provide the correct data intended, that is inadequately obtained when subjects are approached to provide subjective generalized data.

[2] Referring to Appendix XXVII, as a result of this second abbreviation, Elements clustered under 1.4., and 1.7. were omitted from the list.

[3] Referring to Appendix XXVII, as a result of eliminating policymaking and plans, Elements clustered under 3. were eliminated, while retaining the actual status of these Elements clustered under 4. In Elements related to Subjects, subjective perceptions were retained in favor of actual status, resulting in eliminating Elements clustered under 1.1., 1.2. and 1.3. (with Elements under 1.4., 1.5., 1.6. and 1.7. already omitted), while retaining Elements under 2.1., 2.2. and 2.3.

[4] Referring to Appendix XXVII, as a result of this fourth reduction, Elements clustered under 2.4.1., were omitted from the list.

380 Elements as close as possible. [1]

A number of additional smaller amendments resulted in a final questionnaire introduced in Appendix XXVIII[2]*. The 'Work-Oriented Satisfaction Inventory', designated as 'SA-1.02', consists of 147 questions and 22 accompanying questions that cover an abbreviated set of 380 Elements within a business environment, aimed at operationalizing a status quo of each Element, in terms of a qualification, or perceived satisfaction*[3]*.* Each question is provided with letter-coded indications and the Likert-scales used per item. For reasons of brevity, a condensed phrasing is used and explanatory texts included in the original questionnaire have been omitted. As all Elements are assumed to have an equal relative importance, the scaling of all questions is equal, with the exception of a number of general questions. To avoid so-called 'fatigue-effects', caused by repetition in answering, questions are grouped in different clusters. This has led to a different sequence of questions as compared to the overview of Elements presented in Appendix XXVII. In order to provide a means of comparison, the numbered cluster references used as an identification in Appendix XXVII, are referred to in Appendix XXVIII. Finally, in order to neutralize phrasing, questions are formulated with scale-extremes included in the wording, thus avoiding positive or negative phrasing (e.g. Idaszak & Drasgow, 1985).

[1] A seemingly methodologically correct phrasing would have been to ask for each Element if it was related to Motivation as perceived by the respondent. This, however, would have resulted not only in highly biased data, but also in a methodologically incorrect research design, correlating perceived relations to Motivation to factor scores indicating Motivation, thus providing incorrect data, given the initial Problem Statement. Research would have provided an inventory of subjective perceptions in lieu of a correlational overview of Elements: a conceptual error often seen in marketing and electoral research.

[2] In most cases, a single question was formulated covering a number of Elements, following the rationale of the four-fold abbreviation that produced the reduced listing of 161 questions. In 5 cases, a single Element was covered by multiple questions. Referring to Appendix XXVII, clusters 2.3.1.2., 2.3.1.4., 2.3.1.5., 2.3.3.2., and 2.3.4.2. covered respective Elements with an additional 12 questions, thus increasing the list to 173 questions. In 3 cases, however, a subsequent reduction was made with a single question covering multiple Elements. Referring to Appendix XXVII, clusters 2.1.1. and 2.1.2. were summarized into 3 questions due to the personal character of the Elements involved, thus reducing the questionnaire from 173 to 165 questions. Cluster 2.3.4.2.6 consisted of 5 Elements, summarized in 2 questions, cluster 2.3.3.1.consisted of 2 Elements, summarized in 1 question, thus reducing the questionnaire from 165 to 161 questions. Despite a careful reduction in stages, 14 Elements could not be covered as a result of physical constraints, restricting the questionnaire to seven pages. These Elements included clusters 2.2.1.1., 2.2.2.1.1., 2.2.2.1.2., 2.7.1.1., 2.7.1.2., 4.4.1., 4.6.2., 4.6.3., 4.6.4., 4.6.5., 4.7.1., 4.9.1., 4.9.2. and 4.17., thus reducing the final questionnaire to 147 questions.

[3] An overview of the rationale behind the design and phrasing of the questionnaire is provided in: Timmers, J.G., & Mennes, M.A. (1998). *Employee Satisfaction; Fundamentals on the Design of Satisfaction Questionnaires,* Part 1, Research Project for the European Foundation for Quality Management. Brussels: European Foundation for Quality Management.

3. Discussion

A principal aim of Study 7 was to obtain an Inventory of all Elements operational within a business environment.

A claim to achieve completeness in an overview is in itself an overestimation. The list presented can hardly reach such a criterion, set aside that a four-fold reduction was made in questions covering an initial set of 482 Elements, resulting in a final listing containing only 147 questions.

Given, however, that in its final form a listing has been generated which, through a series of carefully substantiated abbreviations, claims to cover all essential Elements within a business environment, a number of further limitations apply.

First, information has been generated through panels within a Western-European context. Although the Elements demonstrate a strong resemblance to the literature, a cultural context sets limitations to the information obtained. Second, having had panel interviews in a single country further restricts a frame of reference and sets limitations to what is perceived of as a 'business environment'. And third, although participants were approached with different backgrounds, they all represent members from a same 'business-related' community, thus producing bias in a generated response.

Given these limitations, nonetheless, it is assumed following criteria set in Chapter 6.4.1.1., that the Elements obtained in the exploratory research from Study 7 provide a workable set of data to present a platform for a next step towards descriptive correlational research.

4. Conclusion

In an attempt to generate an overview of all Elements constituting a business environment, a first set of Elements was generated through panel-interviews. An Inventory of Elements was made by third parties to avoid bias, and supplemented by findings through additional in-company research and from literature.

A final data-set of 482 Elements was operationalized in a questionnaire following a series of substantiated abbreviations. The 'Work-Oriented Satisfaction Inventory', designated as the SA 1.02 inventory, and presented in Appendix XXVIII, consisted of 147 questions, and 22 accompanying questions.

The questionnaire is to be used in a subsequent descriptive research aimed at defining Elements that demonstrate a correlation to components DEDICAT and ACHIEV that capture the concept of Motivation.

6.5.2. Study 8: Descriptive Correlational Research

Elements have been assembled that claim to cover all aspects of a business environment. Through a questionnaire respondents are interviewed on the status of each of these Elements. It is hypothesized that in a series of representative samples Elements that demonstrate a correlation with Motivation must be indicative of one or more of the alleged Conditions that are presumed essential for an Intervention to occur.

Study 8 is aimed at verification of hypothesis H1 and H2, as defined Chapter 6.4.3.

1. Methodology

Sample; Following Chapter 6.4.2., from the 22 companies that had been and were being approached to participate in the empirical research of the dissertation, a random selection of companies was made for Study 8.

From a total of 10 companies that were randomly approached, 2 companies declined, both due to the extensive nature of the questionnaire. The randomized approach method resulted in an over-representation of the South-Africa sample. In order to avoid bias, the sample was reduced using a standard randomized data-reduction procedure in the SPSS processing (Norusis, 1990).

A short description of all participating companies is provided in Appendix XXIX. Summarizing details are provided in Table 6.1.

Procedure; At all locations, the SA 1.02 questionnaire was handed out in a classroom-setting together with the HF 2.01 questionnaire, with reference to Chapter 5.3. The procedure was described earlier in Chapter 5.5.1.1. Questionnaires were translated and made available in English, Dutch, Bahassa Malaysia, Afrikaans and Kosa at the respective locations' facilities. In a number of cases, a random sample of all participants filling-out the HF 2.01, had the SA 1.02 administered (Companies IX, XV and XX). In one company the sampling of the SA 1.02 questionnaire took place at a later date, in conjunction with the HF 2.01 in a separate random sample (Company XIV).

Measures; A correlational research was to be made between Elements, and their evaluation by respondents on their status quo in terms of a qualification, or perceived satisfaction, and components DEDICAT and ACHIEV, capturing Motivation, in the assumption that correlates with DEDICAT would be obtained more frequently in comparison to those associated with ACHIEV, as elaborated on in Chapter 6.4.3.

Thus, following constructs were defined:

		Reduced Sample (1)	Original Sample			
	Sampling date	n	n	N	Response	
		Abs	Abs	Abs	%	
Netherlands						
1 Company XXI	06-1999	108	108	108	100.0%	(2)
2 Company IX	02-2002	40	40	40	100.0%	(2) (3)
	Totals	148	148	148	100.0%	
Malaysia						
3 Company XIV	07-1998	99	99	99	100.0%	(2) (4)
4 Company XV	01-1999	51	51	51	100.0%	(2) (5)
	Totals	150	150	150	100.0%	
South-Africa						
5 Company XVI	10-1998	42	126	142	88.7%	
6 Company XVII	10-1998	53	131	140	93.6%	
7 Company XVIII	10-1998	55	149	160	93.1%	
	Totals	150	406	442	91.8%	
United States						
8 Company XX	04-2002	46	46	46	100.0%	(2) (5)
	Grand Totals	494	750	786	95.4%	

Notes:
(1) Due to over-representation of the South-African sample, a random-reduction was applied to avoid bias
(2) Sample consisted of Business Unit within larger company
(3) For this company a group of participants was randomly approached from the original sample in Table 5.1.
(4) For this company a different group of participants was randomly approached on a different date than the one obtained from the original sample in Table 5.7.
(5) For these companies, a group of participants was randomly approached from the original samples in Table 5.7.

Table 6.1.
Summarized sampling characteristics of the Descriptive Correlational Research samples

- *Process of Motivation.* Level of Motivation was measured using the outcomes of the Studies conducted in Chapter 5, captured in two factor scores component DEDICAT and component ACHIEV, with their essential items defined as follows:

- Component DEDICAT, consisting of items referenced as: ce, cf, cg, ci, cs, ct, dz and eb from questionnaire HF 2.01
- Component ACHIEV, consisting of items referenced as: at, au, av, ba, bb and bc from questionnaire HF 2.01

For a full description of these references used in designating items, see Appendix III, Section B., or Table 5.3., for an abridged overview. The HF-2.01 questionnaire was used to generate factor scores associated to components DEDICAT and ACHIEV, as described in Chapter 5.7.1.1., summarized in Chapter 5.7.2.

- *Elements.* As elaborated on in Chapter 6.5.1.2.II., all Elements within a business environment were operationalized in a reduced format in the SA 1.02 questionnaire, evaluating the perceived status quo of each Element by separate questions, with reference to Appendix XXVIII. All Elements and respective questions are referred to by their reference codes, detailed in the Appendix.

Analysis; The bivariate correlational analysis between items representing Elements

and scores associated to component DEDICAT and component ACHIEV respectively, was performed using a standard Pearson product-moment correlation, as indicated in Chapter 6.4.1.2. In addition, as data were expected to follow a non-normal distribution these correlations were supplemented by non-parametric correlations. In addition to these over-all data correlations, a division was made in different locations for the standard bivariate correlations.

The analysis was performed following criteria set in Chapter 6.4.1.2.

2. Results

From the 8 companies participating in the research, as indicated Chapter 6.5.2.1., a response was obtained from 95.4% on average, with n=750 for the original sample and n=494 for the reduced sample, due to an over-representation of the South Africa data-set. Referring to Table 6.1., four data-sets, were obtained: two sets from the Netherlands (n=148), two from Malaysia (n=150), three from South Africa (n=150, randomly reduced from a total of n=406) and one data-set from the US (n=46). A Cronbach alpha was obtained of .98 for the entire population, indicating an adequate reliability of the questionnaire. Thus, a sample was obtained for the descriptive correlational research that could meet minimal standards of representativity set earlier in Chapter 6.4.2., with some cause for concern on the US-based sample as a result of its limited size.

An overview of results is presented in Appendices, for reasons of brevity: Appendix XXX contains general descriptive statistics for the data-set. Appendix XXXI provides a comprehensive overview of results for item correlations between Elements, operationalized in questions, and component DEDICAT. Appendix XXXII gives an overview of correlations between Elements and component ACHIEV. A numbered indication of each Element and its reference code is provided, together with Pearson Product-moment and Spearman's correlation coefficient scores for the Total (n=494) Population, with Pearson correlation scores provided for the four separate data-sets. In both Tables, correlations between $\pm$ .300 and $\pm$ .400 are indicated in gray, correlations exceeding $\pm$ .400 are indicated in blue, together with indications of significance at the .001, .01 and .05 levels, two-tailed. It is noted that although a random sample of participants from the South Africa data sample (n=150), is included in the Total-Group column to avoid over-representation, the correlations mentioned in the SA column covering the South Africa data-set reflect the scores as obtained from *all* South African participants (n=406).

In the results obtained, correlations between Elements and component DEDICAT were all negatively correlated as a result of a reversed scoring in comparison with the factor score. Correlations averaged around -.26 with highest scores ranging around -.45. Both Pearson and Spearman's bivariate scores appeared to coincide highly, reflecting a negligible divergence from normality: no Pearson scoring in the relevant >-.300 range deviated from its Spearman's counterpart, whereas only 9

Elements scoring >-.300 according to the non-parametric measure were not supported by a Pearson scoring. All correlates >-.300 were significant at the .001 level, two-tailed. 41 Elements had correlates (Pearson) ranging between -.300 and -.400, with 11 Elements correlates (Pearson) exceeding -.400[1]. Thus 52 Elements were correlated according to criteria set earlier in Chapter 6.4.1.2. with factor scores indicating component DEDICAT.

In a rough comparison between data-sets, the Malaysian data-set provided a prominent range of Elements correlating with DEDICAT, whereas the Netherlands data-set appeared to be more modestly related along the range of its scores. The South Africa data-set seemed to follow largely the Total Sample profile[2]. There was a high degree of symmetry especially among the higher correlates (Pearson) between the different data-sets. Data-sets were convergent in correlations exceeding -.300 for 22 Elements. For another 16 Elements 2 of 3 data-sets converged, leaving only 14 Elements with correlates exceeding -.300 that were supported by only one data-set. To reflect the extent at which data-sets coincided, a designation into 'primary' and 'secondary' correlates was made. Primary correlates displayed a high convergence between the different data-sets, with all or at least 2 of 3 data-sets revealing correlates exceeding -.300. Secondary correlates were only represented by 1 data-set. Conversely, with items not meeting the -.300 criterion for the Total-Group sample, only 2 items produced higher correlations for all 3 samples, and 12 were covered by 2 of 3 data-sets, indicating a high convergence of outcomes between the three samples separately and the overview provided in the Total-Group sample.

Summarizing, 52 Elements produced correlations exceeding the $\pm$ .300 criterion, with factor scores indicating DEDICAT. From these 52 Elements, 38, or almost ¾, were designated as 'primary' correlates and 14 as 'secondary'. In Table 6.2., a summative overview is provided of these 52 Elements exceeding the criterion set at $\pm$ .300 for the Pearson product-moment correlations, together with an overview of distinctive data-sets.

With reference to Appendix XXXII, an analysis was made of inter-item correlations between Elements and factor score component ACHIEV.

[1] On a side note, a prominent emphasis in correlations seemed to exist between DEDICAT and Elements indicative of Top Management performance, where effects of Immediate Management appeared to be virtually absent. Although the nature of component DEDICAT, reflecting Company Dedication, seems to favor effects of Top Management, the absence of correlates with Immediate Management is remarkable as component DEDICAT reflects essentials of a Phase of Dedication within the Process of Motivation.

[2] No further analysis was performed on the US data sample due to its smaller sample size.

#	Ref.	Bivariate Item Correlation with Factorscore DEDICAT (3) (4)														
		Total-Group			NL			Mal			SA			US		(5)
		N	r		N	r		N	r		N	r		N	r	(6)
(1)	(2)	(7)									(8)					
3	S - H	447	-0.303	***	132	-0.340	***	132	-0.275	***	388	-0.293	***	43	-0.509	***
5	S - J	444	-0.308	***	130	-0.301	***	131	-0.395	***	388	-0.299	***	43	-0.314	*
10	S - r	490	-0.380	***	148	-0.441	***	148	-0.352	***	400	-0.345	***	46	-0.378	**
11	S - s	489	-0.304	***	148	-0.269	***	148	-0.398	***	399	-0.256	***	46	-0.170	
13	S - u	488	-0.350	***	147	-0.362	***	148	-0.338	***	399	-0.278	***	46	-0.461	***
25	S - am	482	-0.353	***	147	-0.361	***	143	-0.396	***	401	-0.334	***	45	-0.056	
26	S - ap	486	-0.431	***	148	-0.399	***	145	-0.387	***	401	-0.405	***	45	-0.449	**
27	S - aq	485	-0.398	***	147	-0.377	***	145	-0.435	***	401	-0.394	***	45	-0.217	
28	S - ar	485	-0.367	***	148	-0.359	***	146	-0.394	***	395	-0.374	***	45	-0.334	*
29	S - av	478	-0.338	***	145	-0.380	***	143	-0.364	***	394	-0.173	***	44	-0.314	*
30	S - aw	430	-0.461	***	123	-0.527	***	134	-0.423	***	364	-0.404	***	38	-0.520	***
35	S - bh	388	-0.319	***	111	-0.173		117	-0.302	***	338	-0.338	***	36	-0.159	
37	S - bJ	399	-0.345	***	112	-0.268	**	121	-0.344	***	338	-0.367	***	40	-0.230	
38	S - bk	483	-0.337	***	145	-0.380	***	147	-0.420	***	395	-0.176	***	45	-0.002	
39	S - bL	482	-0.382	***	144	-0.356	***	147	-0.468	***	395	-0.275	***	45	-0.342	*
40	S - bn	483	-0.437	***	143	-0.402	***	148	-0.502	***	397	-0.460	***	44	-0.552	***
41	S - bo	484	-0.480	***	143	-0.367	***	148	-0.496	***	395	-0.531	***	45	-0.411	**
42	S - bp	485	-0.414	***	144	-0.179	*	148	-0.471	***	395	-0.459	***	45	-0.545	***
43	S - bq	485	-0.459	***	144	-0.294	***	148	-0.468	***	395	-0.520	***	45	-0.364	*
44	S - bt	485	-0.402	***	144	-0.334	***	148	-0.425	***	394	-0.366	***	45	-0.376	*
45	S - bu	486	-0.427	***	145	-0.417	***	148	-0.383	***	395	-0.428	***	45	-0.389	**
46	S - bv	485	-0.377	***	145	-0.306	***	148	-0.302	***	394	-0.456	***	45	-0.338	*
47	S - bw	481	-0.353	***	143	-0.252	**	148	-0.364	***	391	-0.425	***	45	-0.353	*
48	S - bx	485	-0.324	***	144	-0.272	***	148	-0.266	***	393	-0.399	***	45	-0.289	
49	S - by	486	-0.337	***	145	-0.396	***	148	-0.308	***	395	-0.320	***	45	-0.182	
50	S - bz	484	-0.367	***	143	-0.369	***	148	-0.387	***	395	-0.341	***	45	-0.338	*
52	S - cb	486	-0.349	***	145	-0.217	**	148	-0.399	***	395	-0.304	***	45	-0.594	***
53	S - cc	485	-0.382	***	145	-0.393	***	147	-0.375	***	395	-0.390	***	45	-0.602	***
54	S - cf	483	-0.332	***	144	-0.338	***	147	-0.380	***	395	-0.302	***	45	-0.588	***
55	S - cg	483	-0.419	***	144	-0.472	***	146	-0.398	***	396	-0.391	***	45	-0.510	***
56	S - ch	483	-0.461	***	144	-0.390	***	146	-0.497	***	397	-0.433	***	45	-0.572	***
57	S - ci	483	-0.361	***	144	-0.331	***	146	-0.409	***	397	-0.325	***	45	-0.499	***
58	S - cJ	480	-0.302	***	143	-0.236	**	146	-0.343	***	395	-0.213	***	45	-0.437	**
59	S - ck	482	-0.318	***	144	-0.262	**	146	-0.319	***	395	-0.230	***	45	-0.679	***
61	S - cp	483	-0.358	***	145	-0.295	***	145	-0.299	***	397	-0.411	***	46	-0.506	***
73	S - dd	466	-0.311	***	140	-0.213	*	142	-0.475	***	371	-0.230	***	45	-0.082	
74	S - de	467	-0.318	***	141	-0.174	*	142	-0.515	***	372	-0.279	***	45	0.025	
75	S - df	464	-0.311	***	141	-0.156		141	-0.462	***	369	-0.266	***	45	-0.076	

Notes:
(1) Numbered item, for a full overview of items, reference is made to Appendix XXX
(2) Reference used, for a full overview of items, reference is made to Appendix XXX
(3) Significance levels of Item correlations with Factorscore DEDICAT indicated in color:
Item correlations >.300 ≤.400 or >-.300 ≤-.400
Item correlations >.400 or >-.400
*(4) * Correlation significant at the 0.05 level (2-tailed).*
*** Correlation significant at the 0.01 level (2-tailed).*
**** Correlation significant at the 0.001 level (2-tailed).*
(5) Reference Data samples: NL = Netherlands (n = 148) Mal = Malaysia (n = 150) SA = South-Africa (n = 406) US = United States (n = 48)
(6) r = Pearson Product-moment Correlation Coefficient r = Spearman's correlation coefficient
(7) Total score includes a random sample of n = 150 from the total South-Africa data sample consisting of n = 406
(8) SA Data sample consisting of n = 406

Table 6.2.
Summarized Item Correlations between Elements and Component DEDICAT
A full overview of item correlations is provided in Appendix XXXI

#	Ref.	Bivariate Item Correlation with Factorscore DEDICAT (3) (4)															
		Total-Group			NL			Mal			SA			US			(5)
		N	r		N	r		N	r		N	r		N	r		(6)
(1)	(2)	(7)									(8)						
81	S - dn	479	-0.342	***	144	-0.105		142	-0.427	***	397	-0.339	***	46	-0.230		
104	S - ev	334	-0.416	***	88	-0.428	***	95	-0.285	**	307	-0.408	***	31	-0.308		
105	S - ew	334	-0.351	***	88	-0.398	***	95	-0.298	**	305	-0.385	***	31	-0.304		
114	S - fq	179	-0.372	***	32	-0.292		90	-0.518	***	143	-0.247	**	12	-0.286		
115	S - fr	179	-0.310	***	32	-0.077		90	-0.424	***	143	-0.285	***	12	-0.217		
116	S - fs	178	-0.312	***	32	-0.110		89	-0.410	***	142	-0.231	**	12	-0.470		
124	S - ga	179	-0.340	***	32	-0.290		90	-0.539	***	142	-0.290	***	12	0.167		
125	S - gb	179	-0.323	***	32	-0.220		90	-0.467	***	143	-0.337	***	12	0.408		
126	S - gc	179	-0.306	***	32	-0.230		90	-0.439	***	143	-0.228	**	12	-0.050		
140	S - gz	472	-0.327	***	145	-0.424	***	138	-0.350	***	393	-0.317	***	44	-0.177		
141	S - ha	473	-0.309	***	145	-0.345	***	138	-0.357	***	394	-0.246	***	44	-0.209		
142	S - hb	467	-0.310	***	140	-0.341	***	138	-0.396	***	393	-0.329	***	44	0.012		
143	S - hc	473	-0.350	***	145	-0.381	***	138	-0.320	***	394	-0.360	***	44	-0.236		
144	S - hf	474	-0.380	***	145	-0.394	***	139	-0.342	***	393	-0.409	***	44	-0.405	**	

Notes:
(1) Numbered item, for a full overview of items, reference is made to Appendix XXX
(2) Reference used, for a full overview of items, reference is made to Appendix XXX
(3) Significance levels of Item correlations with Factorscore DEDICAT indicated in color:
Item correlations >.300 ≤.400 or >-.300 ≤-.400
Item correlations >.400 or >-.400
*(4) * Correlation significant at the 0.05 level (2-tailed).*
*** Correlation significant at the 0.01 level (2-tailed).*
**** Correlation significant at the 0.001 level (2-tailed).*
(5) Reference Data samples: NL = Netherlands (n = 148) Mal = Malaysia (n = 150) SA = South-Africa (n = 406) US = United States (n = 48)
(6) r = Pearson Product-moment Correlation Coefficient r = Spearman's correlation coefficient
(7) Total score includes a random sample of n = 150 from the total South-Africa data sample consisting of n = 406
(8) SA Data sample consisting of n = 406

Table 6.2. (Continued)
Summarized Item Correlations between Elements and Component DEDICAT
A full overview of item correlations is provided in Appendix XXXI

The item correlations for ACHIEV seemed to be much less pronounced with an average of -.02 with highest scores reaching in the .15 range. Pearson and Spearman's correlation coefficient scores produced a comparable profile with almost identical significance levels. No correlations emerged exceeding the $\pm$ .300 criterion for a valid indication in defining a relationship as described in Chapter 6.4.1.2. As such, it appeared from the analysis that no Elements, operationalized in the SA 1.02 questionnaire obtained from Study 7, Chapter 6.5.1.2.II., revealed a relation with component ACHIEV, assumed to represent Phase 3 of the Process of Motivation.

Likewise, no noteworthy correlates could be detected in the three valid subgroups representing the Netherlands, Malaysian and South African populations.

Summarizing and evaluating the results from the analysis, 52 Elements appeared to correlate with factor score component DEDICAT, according to criteria defined at $\pm$ .300, with no correlations obtained for Elements in relation to factor score component ACHIEV.

These findings provide evidence in support of hypothesis H1, where a correlation was assumed to exist between components DEDICAT or ACHIEV with Elements within a business environment that could affect Intervention. In addition, results also appear to confirm hypothesis H2, where it was assumed that from all Elements within the experimental setting displaying a correlation, a 'considerable higher proportion' of Elements, would display a correlation with factor score component DEDICAT, than with factor score component ACHIEV.

3. Discussion

Although a connection between Elements and Conditions needs to be established in a next Stage in Study 9, Chapter 6.5.3., with no correlations exceeding the minimum set at $\pm$ .300 found for Elements with component ACHIEV, and with 52 Elements appearing in correlates with component DEDICAT, the preliminary hypothesis H1 is found to be confirmed.

As elaborated on in Chapter 6.4.3., the rationale behind hypothesis H1 was that external influences, i.e. Elements within an experimental setting, would affect Phases 5, 6, 7 and 8 to a greater extent than they would affect Phases 1, 2 and 3 as these Phases would only be influenced indirectly in a subsequent cycle following Phase 8. As a result it was assumed that correlations associated with ACHIEV would be lower. Although a modest number of items display a significant correlation with ACHIEV, no item succeeded in exceeding minimal criteria set. If we are to redefine these criteria towards assessing only a 'small' effect, the analysis would focus on correlations starting from a $\pm$ .100 range according to current standards (Cohen, 1988; Cohen, 1992), with a level of significance defined at $p <$ .01, two-tailed, to reduce a chance occurrence. According to these criteria, 17 Elements emerge as observed in Appendix XXXII, ranging from -.118 to -.240[1]. The conclusion seems justified, then, that relations do exist between Elements isolated and factor score component ACHIEV, but that these relations are not substantial and appear less prominent in results obtained.

Following the observations made earlier in Chapter 3.3.4., identifying Phases 1, 2 and 3 as three initial Phases of 'genesis', where the Process of Motivation appears to be initiated and propelled, and five subsequent Phases where the Process protects itself from outside Intervention, the implications of the findings from the present empirical Studies appear to be three-fold. First, these results could indicate the assumptions are false and results both affecting DEDICAT and ACHIEV are obtained by chance. The conclusion seems premature, as no Competencies or Instruments, based on Conditions have yet been observed. Second, the results are obtained by one or more unidentified co-variates, or Conditions affecting the

[1] With reference to Appendix XXXII, these Elements are identified as S-o, S-y, S-ac, S-ad, S-af, S-ag, S-bi, S-bt, S-bu, S-bv, S-co, S-dc, S-dd, S-de, S-df, S-eu, and S-ev.

observed correlates. In this case, Study 9 is likely to provide direct or indirect indications or evidence of these extraneous interferences. Or third, the results provide a first evidence of the fore mentioned assumptions that Mechanisms in initial Phases serve to protect the Process of Motivation, where addressing Phases 1, 2 and 3 can only be achieved indirectly, as assumed following the Model of Motivation and the observations made Chapter 3.3.2.2. and Chapter 3.3.2.3., and effects of addressing these Phases materializes in expressions contained in a Phase of Dedication.

As an important first preliminary conclusion, then, these results could provide a first preliminary confirmation for the assumption that components DEDICAT and ACHIEV are expected to yield different results when addressed in a Process of Motivation.

Following this conclusion, however, a number of additional observations must be made.

As the data had to include not only the Elements from the SA 1.02 inventory, but also the data from the HF 2.01 list, in order to generate scores associated to components DEDICAT and ACHIEV, the final questionnaire consisted of 250+ items covering 10 pages. The vast list of items could have led to a number of possible detrimental effects in the quasi-experimental design of the Study. Although all questionnaires were verified on effects of a faulty completion of the questionnaires, with no rejects registered, effects of fatigue could have provided a bias in answers. In addition, elaborated on earlier in Chapter 5.5.1.3., limitations apply as a result of using questionnaire HF2.01.

Second, as mentioned earlier, the integrity of a randomized sampling was jeopardized with 2 companies declining to participate. In addition, sample size of the US sample proved too small for an adequate analysis to be made.

A number of limitations apply also to the questionnaire, not only in its reduction of selected items, as compared to the total number of associated Elements, but also to the chosen format, where respondents were asked to provide qualifications instead of subjective experiences, as detailed in Chapter 6.5.1.2.II.

4. Conclusion

In Study 8, a descriptive correlational research was initiated, aimed at verification of a first hypothesis H1, that a number of Elements would display a correlation with components DEDICAT or ACHIEV, represented by their respective factor scores. In addition, in a second hypothesis H2, it was assumed that from all Elements displaying a correlation, a considerable higher proportion of Elements would display a correlation with component DEDICAT, than with component ACHIEV. Although as yet incomplete, the results of this descriptive correlational research confirm both hypotheses.

6.5.3. Study 9: Enabling Conditions

The third, and last of the three studies in this Chapter, aims at a verification of hypotheses H3A and H3B. It is hypothesized that from the Elements isolated in Study 8 displaying a correlation with components DEDICAT and ACHIEV, a majority of at least 80% will be directly or indirectly related to one or more of the Conditions, hence can be explained in terms of one or more of these Conditions.

However, with no apparent correlations emerging from Study 8, between factor score component ACHIEV and an Inventory of Elements, no further analysis can be performed aimed at a verification of hypothesis H3B, and consequently is to be discarded from the Study[1].

1. Methodology

Procedure; The 52 Elements with correlates exceeding $\pm$ .300 obtained from Study 8, were presented to 7 independent observers chosen at random from a group of 60 students following a minor-course in Business Studies at Leiden University, The Netherlands. The observers were given instructions to assess a potential relation between Elements and Conditions, following a standardized format, providing them with a listing of the 52 Elements together with criteria for classifications indicative of the Conditions. The overview of Elements and their classifications were returned anonymously. An overview of instructions and scoring format is provided Appendix XXXIII.

Measures; Given a presumed hypothesis *H3A* an assessment was to be made by independent observers if Elements displaying a correlation with factor score DEDICAT, hence with Motivation, could be directly or indirectly associated to one or more of the Conditions.

Thus, in the analysis, following constructs were defined:

- *Elements.* Elements assumed to demonstrate a relation, directly or indirectly to Motivation were operationalized as the 52 Elements obtained from Study 8, Chapter 6.5.2. For a description and phrasing of Elements reference is made to Appendix XXXIII.

- *Conditions.* The four Conditions were defined as follows:

[1] It is stressed, however, that the exclusion of further analysis is a direct result of a confirmation of hypothesis *H1*, stressing the importance of DEDICAT in its responsiveness to Conditions for Intervention instead of ACHIEV. Reference is made to Chapter 6.4.3. and observations made in Chapter 6.5.2.3.

- *Perceived Significance of the Goal, or objective set;* An Element was considered to be indicative of the Condition, when it was directly related or when it was assumed to facilitate in defining a personal objective.
  In the listing of Elements indications for a potential relation with the Condition were formulated as follows: "The item *...(indicated)...* is / is not related or supportive in defining an objective".
- *Perceived Significance of the Actor-Intervener;* An Element was considered to be indicative of the Condition, when it was assumed to reflect, directly or indirectly, the attributes of an external Actor-Intervener.
  In the listing of Elements indications for a potential relation with the Condition were formulated as follows: "The item *...(indicated)...* could / could not serve as an important actor, or an 'important person'".
- *Perceived Support;* An Element was considered to be indicative of the Condition, when it was assumed to reflect an ability to provide assistance or encouragement.
  In the listing of Elements indications for a potential relation with the Condition were formulated as follows: "The item *...(indicated)...* could / could not be serving as a means to provide assistance or support".
- *Perceived (Mis)-Match in Mutual Perceptions;* An Element was considered to be indicative of the Condition, when it was assumed to reflect an equivalence, or resemblance, in experience[1].
  In the listing of Elements indications for a potential relation with the Condition were formulated as follows: "The item *...(indicated)...* could / could not assist in defining if we have a 'match' or share a 'common language' ".

Analysis; The listing, with each item assessed on its potential relation to one or more of the four Conditions, was analyzed per item by each of the 7 observers. Following criteria defined in Chapter 6.4.1.3., where a relation between a specific item and one or more Conditions was assumed plausible when suggested by ¾ of observers, a criterion for congruency was set when 5 of 7 observers were to indicate a relation for each specific item.

The Analysis was performed on the cumulative scores from the anonymous listings provided by the 7 observers.

2. Results

Independent randomly chosen observers were to classify 52 variables that were found to correlate with Motivation, and to determine whether these so-called 'Elements' were indicative of one or more of the Conditions presumed to be active in each Intervention within the Process of Motivation. Results of the classification appear in Table 6.3. Per item an overview is provided of the assessments made by ¾

[1] Where a Mis-Match, or difference in perception, was considered unfavorable as a Condition.

of observers, as to which of Conditions each item is related to. All Elements and respective questions are referred to by their reference codes. For reasons of brevity, a condensed phrasing is used. For a full description, both of phrasing and of references, see Appendix XXVIII.

As a first observation, only a few items, or Elements, appeared to be indicative of only one Condition: 9 Elements, or 17.3%. (S-H, S-av, S-bh, S-bn, S-bo, S-bq, S-by, S-cg and S-ew). 8 Elements, or 15.4% were indicative of all four Conditions (S-bu, S-bv, S-bz, S-cc, S-fq, S-ga, S-gb and S-gc)[1].

It was assumed that all Elements with a pronounced relation to Motivation, would reflect effects of one or more of Conditions suggested to be essential for a successful Intervention in the Process of Motivation to occur. Following criteria set in Chapter 6.4.1.3., where it was assumed that at least 80% of the 52 items correlating with factor score component DEDICAT were to be classified by independent observers as related to one or more of the Conditions suggested, these results provide an adequate explanatory context for these relations. *From the Data, it was found that 44 of the 52 Elements, or 84.6%, were classified according to these specifications, thus confirming hypothesis H3A, Chapter 6.4.3.*

3. Discussion

The principal aim of the last Study was to obtain an indication if Elements previously isolated in Study 8, displaying a correlation especially with component DEDICAT, are in majority related to one or more of the Conditions, suggested in Chapter 6.2.2. First results appear to confirm these assumptions.

However, a number of observations are to be made.

Considerations to the comprehensiveness and integrity of the listing have been covered in Chapter 6.5.1.3., limitations especially to the content of the listing, were elaborated on in Chapter 6.5.2.3. Given the listing as presented, the principal limitation in this final Study lies in the assessment and classification of the items by the independent observers. A first limitation applies to the definitions used, as presented in Chapter 6.5.3.1. Although the format of the listings presented to the observers was designed to eliminate bias and misinterpretation of concepts used, the anonymous approach prevented a verification of perceptions and interpretations of the observers.

A second limitation lies in the limited number of observers, and their uniform background, both culturally and socially. Further research is needed to further diversify these findings.

[1] From these 8 Elements, 6 Elements (S-bu, S-bv, S-cc, S-fq, S-ga and S-gc) will prove to be indicative of either Extrinsic or Intrinsic Technical and Attitudinal Competencies as to be suggested in Chapter 7.2.2., and analyzed in the empirical research Chapter 7.5.

#	Ref.	Item	Total-Group N	Total-Group r	Condition: Objective	Actor	Support	Match
(1)	(2)	(3)	(4)	(5)				
3	S - H	Workcontent	447	-0.303	√			
5	S - J	Work - performance	444	-0.308	√			√
10	S - r	Work - interest	490	-0.380	√			√
11	S - s	Work - relevance	489	-0.304	√		√	√
13	S - u	Work - challenge	488	-0.350	√		√	
25	S - am	Guidelines and procedures	482	-0.353	√		√	√
26	S - ap	Responsibilities	486	-0.431	√		√	√
27	S - aq	Authority	485	-0.398	√		√	
28	S - ar	Incentives	485	-0.367	√		√	√
29	S - av	Personal objectives	478	-0.338	√			
30	S - aw	*if applicable:* attainability personal objectives	430	-0.461	√		√	
35	S - bh	*if applicable:* satisfaction objectives provided	388	-0.319	√			
37	S - bJ	*if applicable:* satisfaction priorities provided	399	-0.345				
38	S - bk	Company mission/vision statement(s)	483	-0.337	√		√	√
39	S - bL	Company goals	482	-0.382	√		√	√
40	S - bn	Top management - leadership	483	-0.437			√	
41	S - bo	Top management - guidelines and goals	484	-0.480	√			
42	S - bp	Top management - priorities	485	-0.414				
43	S - bq	Top management - decision making	485	-0.459		√		
44	S - bt	Top management - communication	485	-0.402		√	√	√
45	S - bu	Top management - performance stimulation	486	-0.427	√	√	√	√
46	S - bv	Top management - recognition	485	-0.377	√	√	√	√
47	S - bw	Top management - delegation	481	-0.353				
48	S - bx	Top management - performance appraisal	485	-0.324		√	√	√
49	S - by	Top management - team building	486	-0.337		√		
50	S - bz	Top management - personal relationship	484	-0.367	√	√	√	√
52	S - cb	Top management - approachable and receptive for suggestions	486	-0.349		√	√	√
53	S - cc	Top management - dignity and respect	485	-0.382	√	√	√	√
54	S - cf	Top management oriented recognition	483	-0.332				
55	S - cg	Top management oriented trust	483	-0.419				√
56	S - ch	Top management oriented respect	483	-0.461		√		√
57	S - ci	Top management oriented personal relationship	483	-0.361		√	√	√
58	S - cJ	Top management oriented communication	480	-0.302		√	√	√
59	S - ck	Top management oriented accessiblility for suggestions	482	-0.318			√	√
61	S - cp	Company authority structure	483	-0.358				
73	S - dd	*If applicable:* quality program	466	-0.311				
74	S - de	*If applicable:* quality awareness	467	-0.318				
75	S - df	*If applicable:* quality program results	464	-0.311				

Notes:
(1) Numbered item, for a full overview of items, reference is made to Appendix XXVIII and Appendix XXX
(2) Reference used, for a full overview of items, reference is made to Appendix XXVIII and Appendix XXX
(3) Items are formulated in abbreviated format, for a full overview of items, reference is made to Appendix XXVIII
(4) Total score includes a random sample of n = 150 from the total South-Africa data sample consisting of n = 406
(5) Pearson Product-moment Correlation Coefficient of item with Factorscore DEDICAT, for a full overview of items, reference is made to Appendix XXX

Table 6.3.
Summarized Item Correlations between Elements and Component DEDICAT
A Classification of Conditions

#	Ref.	Item	Total-Group N	Total-Group r	Condition: Objective	Condition: Actor	Condition: Support	Condition: Match
(1)	(2)	(3)	(4)	(5)				
81	S - dn	Community orientation	479	-0.342	√			√
104	S - ev	Possibilities career improvement	334	-0.416	√		√	
105	S - ew	Job rotation	334	-0.351			√	
114	S - fq	Direct reports oriented guidelines and goals	179	-0.372	√	√	√	√
115	S - fr	Direct reports oriented priorities	179	-0.310		√	√	√
116	S - fs	Direct reports oriented decision making	178	-0.312		√	√	
124	S - ga	Direct reports oriented trust	179	-0.340	√	√	√	√
125	S - gb	Direct reports oriented accessiblility for suggestions	179	-0.323	√	√	√	√
126	S - gc	Direct reports oriented dignity and respect	179	-0.306	√	√	√	√
140	S - gz	Training - attendance	472	-0.327	√		√	
141	S - ha	Training - information	473	-0.309			√	√
142	S - hb	Training - relevance	467	-0.310	√		√	
143	S - hc	Opportunities personal development	473	-0.350	√		√	
144	S - hf	Opportunities development capacities	474	-0.380	√		√	

Notes:
(1) Numbered item, for a full overview of items, reference is made to Appendix XXVIII and Appendix XXX
(2) Reference used, for a full overview of items, reference is made to Appendix XXVIII and Appendix XXX
(3) Items are formulated in abbreviated format, for a full overview of items, reference is made to Appendix XXVIII
(4) Total score includes a random sample of n = 150 from the total South-Africa data sample consisting of n = 406
(5) Pearson Product-moment Correlation Coefficient of item with Factorscore DEDICAT, for a full overview of items, reference is made to Appendix XXX

Table 6.3. (Continued)
Summarized Item Correlations between Elements and Component DEDICAT
A Classification of Conditions

4. Conclusion

Item-correlates were classified according to Conditions that were assumed to be essential for a successful Intervention to occur in the Process of Motivation.

From the 52 items that appeared to be indicative of Elements that play a significant role in Motivation according to findings from Study 8, 44, or 84.6% were found to be indicative of these Conditions, thus meeting criteria defined in Chapter 6.4.1.3. As a result, hypothesis H3A, formulated Chapter 6.4.3., was considered valid. However, due to a lack of substantial items correlating with ACHIEV, the data did not provide support for hypothesis H3B, aimed at correlations with ACHIEV.

6.5.4. *Conclusions*

Given the Problem Statement, as defined in Chapter 2.5., the empirical research aimed at providing an exploratory and descriptive correlational evidence of the relation between isolated constructs operationalizing the Process of Motivation and concepts, or

'Elements', presumed to be indicative of Conditions, assumed to be necessary for an Intervention to occur in the Process of Motivation.

An Inventory was made in Study 7, of all Elements within the settings of a business environment, operationalizing and translating these Elements into a questionnaire, designated as 'SA-1.02'. On the assumption that the Conditions were the principal Determinants initiating an Intervention, it was hypothesized that all Elements within this experimental setting displaying a correlation with Motivation would be indicative of, and directly or indirectly related to one or more of these enabling Conditions, hence could be explained in terms of one or more of these Conditions.

From an Inventory of Elements, 52 emerged with correlates primarily associated to factor score component DEDICAT, providing evidence in support of hypotheses H1 and H2, formulated Chapter 6.4.3.

From these 52 Elements, 84.6% were found to be indicative of one or more of the four Conditions, by independent, randomly selected observers. As a consequence, Study 9 provided a confirmation for hypothesis H3A, formulated Chapter 6.4.3., that Elements associated to Motivation, and correlating with DEDICAT were directly or indirectly related to one or more of the four enabling Conditions. However, due to a lack of substantial items correlating with ACHIEV, the data did not provide support for hypothesis H3B, aimed at correlations with ACHIEV.

6.6. Summary

Following the presentation of a Model of Motivation, it was assumed in Chapter 6 that specific Conditions were needed for an interfering Actor-Intervener to influence the Process of Motivation induced within the Individual.

Following an inductive inference briefly described in Chapter 6.2.2., based on the Model of Motivation presented Chapter 3., four Conditions were proposed that were assumed to be essential in addressing, or 'Management' of Motivation:

- *Perceived Significance of the Goal, or objective*
- *Perceived Significance of the Actor-Intervener*
- *Perceived Support*
- *Perceived (Mis)-Match in Mutual Perceptions*

Following the Problem Statement defined in Chapter 2.5., the empirical research was to provide a descriptive correlational evidence for these Conditions by a straightforward verification if correlations with Motivation could be explained as resulting from these alleged underlying Conditions. To this end, within a business environment, an Inventory was made of all aspects, or so-called 'Elements', contained within this environment. Given that these four Conditions were assumed to be operational in each Intervention inducing Motivation, it was hypothesized that all Elements displaying a relation with Motivation were to be indicative of one or more of these Conditions. Each correlation between isolated constructs operationalizing the Process of Motivation and

concepts operationalizing these Elements was assumed to be an expression of an Intervention in the Process of Motivation, and as such, was assumed could be reduced to the effects of one or more of these four elementary Conditions. In short, if an Element was to affect Intervention in the Process of Motivation it was assumed to be initiated by one or more of these Conditions.

In three subsequent steps these assumptions were verified.

Study 7, Chapter 6.5.1., aimed at obtaining an extensive overview of all Elements within a business environment. An Inventory of Elements was made containing 482 Elements. In a successive, four-fold abbreviation a questionnaire, SA 1.02, was obtained that would cover these Elements from a listing containing 147 questions, and a number of accompanying questions.

Study 8, Chapter 6.5.2., was to determine which Elements from the Inventory would reveal a relationship with Motivation, operationalized in factor scores DEDICAT and ACHIEV. Following observations made in Chapter 3.3.2. and summarized in Chapter 6.4.3., it was assumed that a considerable higher proportion of Elements would display a correlation with component DEDICAT, than with component ACHIEV. 52 Elements appeared to correlate with component DEDICAT, according to criteria defined in Chapter 6.4.1.2., with no correlations obtained for Elements in relation to component ACHIEV.

In Study 9, Chapter 6.5.3., it was found that from these 52 Elements, 44 Elements, or 84.6%, were related according to assessments made by (more than) 5 of 7 independent observers, thus exceeding criteria defined in Chapter 6.4.1.3. With no correlations meeting initial criteria, the Study produced no confirmation for factor score component ACHIEV.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided exploratory and descriptive correlational evidence for a relation between constructs capturing Motivation and the Conditions enabling an adequate Intervention to occur within the Process of Motivation.

Providing evidence for these Conditions is the key finding of the second empirical research of this dissertation.

In addition, these findings provide secondary empirical evidence in support of the Model of Motivation, from which these Conditions were derived.

Chapter 7
Empirical Research
Competencies Enabling Conditions for Intervention in the Process of Motivation

7.1. Introduction

In Chapter 5, elementary constructs have been isolated, that present a match with elementary Phases of the Model of Motivation presented in Chapter 3, thus providing support for the Model that was assumed to represent the Process of Motivation.

In Pre-Fundamentals to the study, a reintroduction of inductive inference was proposed in generation of explanatory theoretical Models. Where these theoretical Models lead to clearly defined and constrained hypotheses, they constitute not a departure from, but rather a re-enrichment of hypothetico-deductive tradition.

In defining these hypotheses, Chapter 6 provided additional, secondary evidence in support of the Model, supplementing findings obtained in Chapter 5, whereby first insights on the Process of Interference were obtained, as called for in the Problem Statement, Chapter 2.5.

After observing Conditions, Chapter 7, then, is to provide descriptive empirical evidence for the second Determinant in the Process of Interference: the Competencies enabling Conditions for Intervention in the Process of Motivation. Empirical research on its associated hypotheses would constitute a second supplemental verification of the Model.

The objective of Chapter 7 is derived from the Problem Statement defined in Chapter 2.5.:

- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
  - *into the Competencies initiating the Conditions to come into effect, by means of:*
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*
    - *and descriptive empirical research providing evidence of the relation between concepts presumed to be indicative of these Conditions and concepts operationalizing these Competencies,*

      thus providing secondary empirical evidence in support of the Model of Motivation, from which these Competencies are derived.

7.2. Application of the Model of Motivation
An Analysis of Competencies

In Chapter 6, first evidence was obtained for the Conditions that were assumed to initiate a Process of Interference, as based on the explanatory theoretical Model of Motivation presented in Chapter 3. As assumed in the Fundamental Assumptions, Chapter 2.3.1., these Conditions for Intervention in the Process of Motivation are, in turn, enabled by Competencies.

Before proceeding towards empirical research, a brief presentation is provided of a theoretical Model on Competencies based on the Model of Motivation, in accordance with the Problem Statement. Reference is made to Mennes (2016, *in press*), notably Chapter 9 and Chapter 17.3., for an extensive overview.

Prior to the analysis, a brief description of Assumptions is provided.

7.2.1. Assumptions Preceding an Analysis of Competencies

Conditions initiating the Process of Interference were identified by reducing through a number of Assumptions, the vast universe of possible options in which the Process of Interference could be expressed, to an 8x8 matrix of possible Intervention Strategies. For further details on these Assumptions, reference is made to Appendix XXIV, Section A., notably A.2.

As briefly mentioned in Chapter 6.2.2., a recurrent pattern and algorithm was observed, which revealed the 8x8 matrix of Intervention Strategies, which conceptualized the Process of Interference in its variety of manifestations, could be divided in two antagonistic approaches. These two basic approaches in addressing, or 'Management' of Motivation were defined as two principal 'Modalities' in Management of Motivation: an Extrinsic and an Intrinsic Modality, both consisting of four distinct levels of Intervention. For further details, reference is made to Appendix XXIV, Section B., notably B.2., with concluding observations in B.2.7.

The distinction provided a platform for an inductive inference that was to lead to an identification of essential Competencies. With reference to Appendix XXXIV, Section A., notably A.2., it was assumed the inference was to pursue two distinct modes in the analysis of Competencies. From both sets of four Intervention levels, a single level was observed, that was assumed to provide the most favorable scenario within each Modality for addressing the Process of Motivation.

Thus, two optimal Modalities emerged in Management of Motivation:

- *An Extrinsic Modality in Management of Motivation:* the Modality was found to provide substantial opportunities for Control, at the expense, however, of Productivity. From four levels of Intervention, the Intervention Strategy addressing both a Phase of Expectancies and a Phase of Internally Evoked Self-Assessment (level 4) appeared to yield highest effects.

- *An Intrinsic Modality in Management of Motivation:* the Modality was found to lead to high Productivity, at the expense, however, of only limited opportunities to apply Control. From four levels of Intervention, the Intervention Strategy that withholds addressing any Phase (level 8) appeared to yield highest results.

7.2.2. An Analysis of Competencies

Thus, it was assumed, the inductive inference was to pursue two distinct modes in the analysis of Competencies. Furthermore, it was assumed not all Conditions could be targeted by Competencies. More specifically, it was found that Conditions of Perceived Significance, both in the objective set and related to the Actor, could not be directly affected. Only Conditions of Perceived Support and of Perceived (Mis)-Match in Mutual Perceptions, were thought could be targeted by specific Competencies.

For further details on the inductive analysis, reference is made to an abbreviated overview in Appendix XXXIV, Section B.

From the analysis, then, two distinct sets of Competencies emerged:

- For an optimal Extrinsic Modality in Management of Motivation:
  - A single Extrinsic Attitudinal Competency, defined as:
    - *An Extrinsic Attitudinal Competency, 'Dignity':*
      Actions or activities aimed at initiating perceptions of Support in Phase 2, a Phase of Effort, by providing Unconditional Support for the Effort invested by the Individual. These actions or activities initiating perceptions of Support are conceptualized as expressions of 'Dignity' by an Actor-Intervener, and are captured in expressions of 'worth' and 'pride'.
  - Four Extrinsic Technical Competencies, defined as:
    - *A Technical Competency of Providing Extrinsic Preconditions:*
      Actions or activities aimed at initiating perceptions of a Match in Phases 1, 2 and 3, providing clarity in procedural standards and enabling circumstances, e.g. in tools, materials, contracts, and pay;
    - *A Technical Competency of Clarifying Extrinsic Outcomes:*
      Actions or activities aimed at initiating perceptions of a Match in Phase 4, by providing clarity in goals, e.g. by means of key performance indicators, or communicating priorities;
    - *A Technical Competency of Providing Active Assistance:*
      Actions or activities aimed at initiating perceptions of a Match in Phases 5, 6 and 7, by conveying the standards the Individual is to follow in initiating a successful strategy in Mechanisms of Coping. From a positive perspective these actions or activities would include praise, appreciation, agreement, consensus, eventually resulting in a delegation of tasks and responsibilities and specifically acknowledging the Individuals' contribution. Actions or activities

aimed at providing assistance in a more negative context would include corrective, reprimanding actions or criticizing;
- *A Technical Competency of Providing Active Feedback:*
  Actions or activities aimed at initiating perceptions of a Match in Phase 8, providing specific feedback in various degrees on performance, on outcomes and results, and on consequences.

- For an optimal Intrinsic Modality in Management of Motivation:
  - Three Intrinsic Attitudinal Competencies, defined as:
    - *An Intrinsic Attitudinal Competency, 'Respect':*
      Actions or activities aimed at initiating perceptions of Support in Phase 1, a Phase of Expectancies, by providing Unconditional Support for the Goal, or objective defined by the Individual. These actions or activities initiating perceptions of Support are conceptualized as expressions of 'Respect' by an Actor-Intervener, and are captured in expressions of 'esteem' and 'acknowledgment';
    - *An Intrinsic Attitudinal Competency, 'Dignity':*
      As stated, actions or activities aimed at initiating perceptions of Support in Phase 2, a Phase of Effort, by providing Unconditional Support for the Effort invested by the Individual. These actions or activities initiating perceptions of Support are conceptualized as expressions of 'Dignity' by an Actor-Intervener, and are captured in expressions of 'worth' and 'pride';
    - *An Intrinsic Attitudinal Competency, 'Trust':*
      Actions or activities aimed at initiating perceptions of Support in Phase 3, a Phase of Internally Evoked Self-Assessment, by providing Unconditional Support for objective and subjective assessments made by the Individual. These actions or activities initiating perceptions of Support are conceptualized as expressions of 'Trust' by an Actor-Intervener, and are captured in expressions of 'confidence' and 'belief'.
  - Four Intrinsic Technical Competencies, defined as:
    - *A Technical Competency of Clarifying Intrinsic Preconditions:*
      Actions or activities aimed at initiating perceptions of a Match in Phases 1, 2 and 3, providing clarity in preconditions as defined by the Individual. In an Intrinsic setting these preconditions originating from the Individual are sought after through listening skills of the Actor-Intervener;
    - *A Technical Competency of Clarifying Intrinsic Outcomes:*
      Actions or activities aimed at initiating perceptions of a Match in Phase 4, by assisting through a process of coaching and confrontation towards self-reflection by the Individual. The Actor-Intervener assists in providing clarity in standards of the Individual that are providing a disruption in the Process of Motivation;

- *A Technical Competency of Providing Passive Assistance:*
  Actions or activities aimed at initiating perceptions of a Match in Phases 5, 6 and 7, meant to facilitate handling the effects of Reality, using standards defined by the Individual. A strategy, consisting of Mechanisms of Coping setout by the Individual, is followed without interference or personal preferences of the Actor-Intervener;
- *A Technical Competency of Providing Passive Feedback:*
  Actions or activities aimed at initiating perceptions of a Match in Phase 8, meant to identify the cues that are provided by the Individual of perceptions of Support and non-Support. Actions or activities initiated by the Actor-Intervener are aimed at recognizing and consolidating these cues.

7.2.3. *Conclusions*
Preamble to a Definition of Hypotheses

It is assumed the Model obtained in an analysis of Competencies, as derived from the Model of Motivation, provides an explanatory context from which elementary hypotheses can be derived, as elaborated on in Chapter 1.5.

The Extrinsic and Intrinsic Competencies described in the analysis of Competencies have been identified as essential to the theoretical Model. These essential constructs, then, are to be elementary in the formulation of hypotheses provided in Chapter 7.4.3.

In a verification of these Competencies, empirical research on these hypotheses is to reflect on the Model of Motivation, from which these Competencies are derived.

7.3. Operationalization

Chapter 7, then, seeks to provide descriptive evidence for the assumed relation between both sets of Competencies, and the Conditions assumed necessary for an Intervention to occur.

Both Determinants Competencies and Conditions are to be captured into concepts that would enable an adequate verification through empirical research.

In capturing, or operationalizing, the concept of Conditions a number of approaches seem to be applicable.

The first is to have each Condition represented by one or more concepts or variables that would capture its essence. There is an important shortcoming to this approach, however, that will affect the empirical research in the present Chapter to a great extent. In defining concepts or variables that would operationalize, or capture, a specific Condition, the phrasing to be used tends to coincide with the Competencies defined to instigate these

Conditions. Competencies are, in effect, a substitution in practical terms of activities evoking those Conditions[1]. In addition, both Determinants are represented by concepts that reveal a considerable overlap[2] [3]. As a consequence, high levels of co-variation are expected to occur between variables representing both entities.

Referring to Mennes (2016, *in press*), notably Chapter 11.3., an alternative approach was suggested by focusing on the objective the Conditions are aiming at: their capacity to lead to an Intervention that successfully interferes within the Process of Motivation. The approach would provide adequate evidence in demonstrating a relation between specific Competencies and the occurrence of a successful Intervention, and thus would meet standards set forth in the Problem Statement. The concepts are to be translated into quantifiable variables by means of a series of specific questions[4].

7.4. Research Design

The empirical research, then, seeks to provide evidence for a relation to exist between certain concepts operationalizing specific Competencies and the occurrence of a successful Intervention, aimed at by the four Conditions isolated earlier.

Multiple regression analysis will be used to demonstrate relations.

It is assumed that in capturing in broader terms the concept of Conditions, as suggested in Chapter 7.3., it is preferable to attempt representing the concept by as few variables as possible, as it greatly improves the extent at which statistical analysis will be able to provide inferences as to the adequacy of a proposed underlying theoretical Model.

[1] An example is the Condition of Perceived Support, and the Extrinsic Technical Competency of Providing Active Assistance, or the Intrinsic Technical Competency of Providing Passive Assistance. Both Competencies were defined in Chapter 7.2.2. as actions or activities including praise, appreciation, agreement, respectively actions or activities aimed at assistance in Coping strategies, and are expected to be operationalized by concepts or variables revealing considerable overlap with concepts or variables capturing a Condition of Perceived Support.

[2] As an example, the Condition of a Match in Mutual Perceptions could be represented by a concept capturing the adequacy of management in providing guidelines and standards to employees. In defining the concept, an overlap is expected to occur with concepts associated with a Technical Competency of Clarifying Extrinsic Outcomes, which makes use of a phrasing in comparable terms.

[3] This is the main reason for excluding a correlational research between concepts representing Competencies and the factor scores representing the concept of Motivation. Especially factor score DEDICAT represents a cluster of concepts that contain the values of Respect and Dignity. When correlating DEDICAT with concepts capturing the Attitudinal Competencies of Respect, Dignity and Trust, one is to expect considerable degrees of co-variation between respective variables.

[4] No specific questionnaire was used in the research; rather these specific questions were added to existing formats. Reference is made to Chapter 7.5.2.1.

At the same time however, a reduction in concepts increases the probability of misrepresentation. In an attempt to optimally meet both standards, a single concept will be presented with its representational properties verified.

A verification of these assumptions leads to a following two-fold research design:

- *A first analysis will aim at a two-fold verification:*
  - *First of the suitability of the single concept capturing the distinct Conditions, following the analysis in Chapter 6;*
  - *Second, of the relation between the single concept and Motivation as expressed in factor scores, following the analysis in Chapter 5;*
- *A second analysis consists of an overview of relations between the single concept capturing Conditions and the more specific concepts capturing all Competencies, both Attitudinal and Technical, following an Extrinsic and Intrinsic approach using multiple regression procedures;*

For a full overview and rationale of the research design, reference is made to Mennes (2016, in press), notably Chapter 11.4.

7.4.1. Statistics

The Problem Statement calls for descriptive research providing evidence of relations between concepts operationalizing specific Competencies and a single concept capturing the occurrence of a successful Intervention. A two-fold approach in the statistical analysis is proposed:

- A verification of assumed relations using multiple regression techniques and supplemented by a correlational analysis;
- Descriptive research providing evidence of relations using multiple regression analysis, with hierarchical regression in elaborating on distinct effects of both Attitudinal and Technical Competencies.

Although an analysis of variance provides a suitable alternative as a statistical analysis especially in the preliminary verification of assumed relations, preference is given to a regression analysis, as the approach transcends a simple comparison of means (Rosnow & Rosenthal, 2005; Rutherford, 2001), and follows a traditional approach in social sciences (Cronbach, 1957), although it is stressed at this point that both approaches can be looked upon as following conceptually a same procedure (Cohen, 1968; Howell, 2002)[1].

[1] Basically, both analysis of variance and regression analysis seek to analyze the impact of independent variables on response variables. But while analysis of variance seeks to define the scope of variables to be included in an experiment, the regression analysis provides information on how much variation in the dependent, response variable is explained by the distinct independent variables. The emphasis on variance explained, has also determined a preference between both approaches, as it optimally expresses the evidence of a relation sought after in the Problem Statement.

1. Regression Analysis, Correlational Analysis

As stated at the start of Chapter 7.4., a single concept is to capture adequately the Conditions in each specific form. This single concept is to be verified on its ability to adequately capture the Conditions in all aspects both sets of Attitudinal and Technical Competencies are aiming at. Hence, a relation is to be demonstrated between the single concept and the targeted Conditions. Specific questions are used to quantify these relations. In a regression analysis an assessment will be made of the relationship between a number of explanatory variables operationalizing each targeted Condition, and the single concept variable as a dependent or response variable. The analysis aims at establishing an indication of the strength of relations by means of a Multiple correlation coefficient and determining Standardized β coefficients for each explanatory variable and significance in their respective contributions, with minimal standards set at a $p<.05$ level.

A verification of collinearity is to precede the analysis. As an indication of collinearity, inter-item correlations must be <.90 (Field, 2005). Moreover, in an additional assessment of linear relationships between predictors, a Variance Inflation Factor (VIF) is to be <10, with a Tolerance >.10 (Myers, 1990).

Finally, a Durbin-Watson test is to determine correlation between adjacent residuals, with scores approximating 2 (Durbin & Watson, 1951).

As stated in Chapter 7.3., the concept is assumed to represent not only the targeted Conditions, but also to capture in broader terms the occurrence of a successful Intervention. As such, it is assumed to be related to the Process of Motivation. A verification of adequate representational properties called for in Chapter 7.4., must therefore include a confirmation of this relation between the broader concept and the Process of Motivation. Motivation is to be captured using factor scores, associated with components DEDICAT and ACHIEV, following conclusions made in Chapter 5.5.3. Establishing an indication of strength in this relation will follow a same procedure as for relations with targeted Conditions, with the exception that a relation between the single concept and distinct factor scores capturing Motivation, simplifies the regression procedure to only establishing a Pearson product-moment correlation coefficient[1]. An analysis of variance is to test the F-ratio with the associated significance value providing an indication of the degree of prediction of the single concept as response variable and the distinct factor scores. Significance is to meet standards set at $p<.05$.

Factor scores are to be defined following the methodology described in Chapter 5.7.1.1. and summarized in Chapter 5.7.2.

All regression analyses are made using standard SPSS procedures (Norusis, 1990).

[1] The Standardized β coefficient will coincide with R, as standardization eliminates β_0 in the equation: $\acute{Y}_z = \beta_0 + \beta x_z$, with only one predictor variable. The equation thus becomes: $\acute{Y}_z = \beta x_z$, where β coincides with R.

2. Regression Analysis

The Problem Statement calls for descriptive research providing evidence of relations between concepts operationalizing distinct Competencies and a single concept presumed to be indicative of targeted Conditions. Concepts will be translated into quantifiable variables, resulting in a series of distinct questions. A subsequent regression analysis is to report the degree of linear relationship between predictor variables operationalizing both Attitudinal and Technical Competencies and a criterion variable, represented by the concept operationalizing a successful Intervention in the Process of Motivation. Both sets of Attitudinal and Technical Competencies will be observed separately, and only a hierarchical regression will be made when the data justifies the supplemental analysis to be made.

There appears to be no clear consensus in the literature about the exact specifications on presenting data obtained from regression analysis (American Psychological Association, 2001; Cohen, Cohen, West & Aiken, 2003; Field, 2005). Given the Problem Statement, the descriptive research is to provide insights into the degree of linear relationship. As such, the Standardized regression coefficients, or β's, are to be reported because these β-weights allow one to compare the strength of each predictor variable. A t-test is to be performed on all Standardized β's. A significant difference from zero is to exceed $p<.05$.

In addition, the Multiple correlation coefficient R^2 is to be reported to assess the regression equation in a more general sense than the individual Standardized regression coefficients. R^2 describes the overall proportion of variance in the criterion variable that can be explained by the linear regression equation. In a sense, a comparison is made between the Residual sum of squares SS_R obtained through the differences between the observed data and a proposed regression line, versus the Total sum of squares SS_T obtained through the differences between the observed data and a straight line representing their mean value. R^2 is the resulting Model sum of squares SS_M relative to SS_T. To test whether the linear regression equation is significantly better at predicting the outcome than using a mean value, an analysis of variance is performed. The F-ratio represents the ratio of the improvement in prediction that results from fitting the equation, relative to the inaccuracy that still exists within the equation. Assessing the ratio provides in a means of establishing significance, and to test the overall fit of the regression equation, or model, and therefore to test R^2. As a criterion for significance, the regression equation is considered to have provided a significant improvement in the ability to predict the response variable when the F-ratio is significant at $p<.05$.

As stated, an additional ΔR^2 will be reported when accompanying hierarchical regressions are performed. In assessing whether the change in R^2 is significant an analysis of variance is performed with significance levels set at $p<.05$.

As indicated in Chapter 7.4.1.1., an analysis of multicollinearity is to be performed together with an assessment of linear relationships and a Durbin-Watson test, preceding the regression analysis.

As Competencies have been presented theoretically as distinct sets of Extrinsic and Intrinsic Intervention Competencies, both will also be presented as distinct entities in the regression analysis. In the descriptive research, both Attitudinal and Technical Competencies will be observed in both distinct and combined settings.

We thus obtain a following scheme for the regression analysis:

- Regression analysis Extrinsic Intervention Competencies:
  - Regression analysis Attitudinal Competency
  - Regression analysis Technical Competencies
  - Regression analysis Attitudinal & Technical Competencies
- Regression analysis Intrinsic Intervention Competencies:
  - Regression analysis Attitudinal Competencies
  - Regression analysis Technical Competencies
  - Regression analysis Attitudinal & Technical Competencies

All regression analyses are made using standard SPSS procedures (Norusis, 1990).

7.4.2. Sampling

Having set the requirements for obtaining an adequate descriptive research to provide evidence of relations as indicated in the Problem Statement, a next step consists of defining an adequate sample, both in location, size and content.

As stated Chapter 2.4.3.3., the empirical research is to be performed within a business environment. In approaching companies, preference is given to a single company with diverse operational activities both in production and in commercial services situated at different locations, rather than targeting multiple companies in a diversified setting. The rationale to obtain data from a single company is to allow for an assessment of effects within a comparable setting, while at a same time compensating for possible company-related operational characteristics. However, in results obtained, the choice for a single company is expected to limit the extent at which findings can be generalized to other settings. In interpreting the data, these reservations must therefore be made prominent in final discussions on results of the Studies.

For an adequate regression analysis to be performed, a minimal sample size per location is needed. Sample size depends on the strength of effect to be detected, and the power desired to detect these effects. As the estimate for a value R, obtained from regression, is dependent on the number of predictors k, and the sample size n, a number of specific criteria have been formulated in literature (Harris, 1975; Nunnally, 1978; Green, 1991; Miles & Shevlin, 2001). Given the expected R to be 0 for random data, the equation $R=k/(n-1)$, would suggest at least $n \geq 100$, for 5-7 predictors. Miles and Shevlin have provided graphs to estimate adequate sample sizes needed to achieve different levels of power, for different effect sizes, with varying numbers of predictors. Based on their estimates, for achieving a level of power of .8 (Cohen, 1988; 1992), with an expected large to medium effect, and a maximum of 10 predictors, a sample size between 60 and

150 is suggested. Green (1991) developed more elaborate formulas where both number of predictors and effect sizes are taken into account[1]. Given that the power for a test of a multiple regression with a medium effect size is approximately $\geq$ .80, he defines a minimal sample of 50 + 8k in testing R^2. In addition, given that the power for a test of a medium-sized partial correlation between an outcome and a predictor holding all other predictors constant would be an estimated .80, he defines a minimal sample of 104 + k in testing individual predictors.

With 5 to 10 predictors, these criteria suggest a minimal sample size of approximately $n \geq 110$.

However, as any multiple correlation is expected to depart significantly from zero, as the number of cases becomes quite large, it is suggested to measure the smallest number of cases that has an adequate chance of revealing a relationship of a specified size (Green, 1991; Tabachnik & Fidell, 2007). In the literature, no specifications could be found for defining limitations to a sample size[2]. As a consequence, results are to be provided of all distinct sub-samples, with $n \approx 110$ per sub-sample, with a provision to reduce sub-sample-sizes using ad random procedures. Especially, where effects will appear to be large, sample sizes are to be reconsidered.

Response percentages in the different groups are to exceed 70%. For each sample, a KMO analysis of sampling adequacy will be made (Kaiser, 1970).

7.4.3. Hypotheses

We are to verify an assumed relation between Conditions enabling Intervention in the Process of Motivation, and a number of distinct Competencies enabling these Conditions to occur. To this end, a series of distinct questions is to be administered within a single company at various locations differing in operational activities. Within these sub-samples, multiple regression analysis is to provide a confirmation for these assumptions.

Prior to formulating hypotheses for testing, however, a number of observations are made.

[1] $n \geq (8/f^2) + (k - 1)$, where $f^2 = .02$, .15, and .35 for small, medium and large effects. See: Green, 1991.

[2] Green, elaborating on the effects of power on sample sizes, states: "... larger sample sizes might be justified on issues unrelated to power. These other issues must be considered on their own merits" (Green, 1991, p. 509).

A single concept is to capture the Conditions that are assumed to be targeted. In a first observation, it is stressed that not all Conditions are assumed can be targeted by Competencies. Referring to Chapter 7.2.2., only Conditions of Perceived Support and of Perceived (Mis)-Match in Mutual Perceptions, were thought could be targeted by specific Competencies. As such, a single concept is to capture not all Conditions, but only Conditions defined as Perceived Support and Perceived (Mis)-Match.

In defining the single concept capturing these targeted Conditions, it was suggested in Chapter 7.3. the concept would center on the objective the Conditions are aiming at: their capability to lead to an Intervention which successfully interferes within the Process of Motivation. The liaison with Motivation is to be verified as stated in Chapter 7.4., and factor scores ACHIEV and DEDICAT will be used to capture the Process of Motivation in this initial analysis. However, following the exposés in Chapter 3.3.2., and Chapter 6.4.3., Conditions are expected to affect Phases 5, 6, 7 and 8 to a higher extent than Phases 1, 2 and 3, resulting in expected higher correlations with DEDICAT, indicative of Phases 5, 6, 7 and 8, than expected correlations with ACHIEV, indicative of Phases 1, 2 and 3. Consequently, Components initiating Conditions are also expected to have a differential effect on both factor scores. Notably, the single concept is expected to generate higher correlations with DEDICAT than with component ACHIEV.

Secondly, as distinct Modalities in Intervention Strategies were assumed, a final verification of hypotheses is to be performed with a separate analysis for both Modalities, i.e. Extrinsic Intervention Competencies as opposed to Intrinsic Intervention Competencies.

Following these preliminary observations, and following the Research Design proposed at the start of Chapter 7.4, a number of hypotheses are to be met to provide an adequate confirmation for the assumed relation, indicated in the Problem Statement, between the two targeted Conditions enabling Intervention in the Process of Motivation, and the two Extrinsic and Intrinsic Intervention Competencies, each with their respective Attitudinal and Technical Determinants:

- *With Conditions assumed to be captured by a single concept,*
  - *where the single concept is assumed to capture Conditions that can be addressed by Competencies defined as Perceived Support and Perceived (Mis)-Match in Mutual Perceptions, operationalized by a series of specific questions, where Conditions of Perceived Significance, both in an objective set and related to the Actor, are assumed can not be targeted,*
  - *where the single concept is assumed to capture also the occurrence of a successful Intervention in the Process of Motivation, primarily displayed in relation to component DEDICAT, rather than component ACHIEV, that are both assumed to capture the Process of Motivation,*
- *with Extrinsic and Intrinsic Intervention Competencies assumed to be captured through a series of questions, thus enabling a quantification of effects,*

following hypotheses are formulated:

- *Extrinsic Intervention Competencies:*
  a) *Hypothesis 1A (H1A): It is hypothesized that the Extrinsic Attitudinal Competency is positively related to the single concept capturing both targeted Conditions.*
  b) *Hypothesis 1B (H1B): It is hypothesized that Extrinsic Technical Competencies are positively related to the single concept capturing both targeted Conditions.*
- *Intrinsic Intervention Competencies:*
  a) *Hypothesis 2A (H2A): It is hypothesized that Intrinsic Attitudinal Competencies are positively related to the single concept capturing both targeted Conditions.*
  b) *Hypothesis 2B (H2B): It is hypothesized that Intrinsic Technical Competencies are positively related to the single concept capturing both targeted Conditions.*

  Where a 'positive relation' is defined as:
  - *all Multiple correlation coefficients of the distinct regression analyses significant at $p<.05$, and a significant difference from zero exceeding $p<.05$ on at least 2/3 of all t-tests performed on separate Standardized β's in these various regression analyses.*

Given the initial assumptions stated Chapter 7.4., when these hypotheses are met, it is assumed that a descriptive evidence will have been provided of a relation between Conditions assumed to be targeted and Competencies defined to successfully address these Conditions, as indicated in the Problem Statement, Chapter 2.5.

A confirmation of these hypotheses will provide secondary empirical evidence in support of the Model of Motivation, from which these Competencies are derived.

7.4.4. *Conclusions*

A single concept is to represent two Conditions, presumed to be targeted by two sets of Competencies: Extrinsic and Intrinsic sets of Attitudinal and Technical Competencies. Empirical research will be aimed at providing descriptive evidence of a relation between this single concept and concepts presumed indicative of the Extrinsic and Intrinsic sets of Attitudinal and Technical Competencies. Prior to the analysis, a verification is to be made of alleged relations between the single concept and targeted Conditions on the one hand, the Process of Motivation on the other.

As a summary, then, a following research design is proposed:

- *Study 10: Preliminary Analyses*
  - *I. Conditions*
  - *II. The Process of Motivation*
- *Study 11: Regression Analyses: aimed at verification of H1A, H1B, H2A and H2B.*

7.5. Empirical Research

7.5.1. Study 10: Preliminary Analyses

The study is aimed at verifying the alleged relation between the single concept that is to capture the two Conditions, and its relation to the Process of Motivation, in order to provide input for descriptive research, aimed at verification of H1A and H1B, H2A and H2B in Chapter 7.5.2.

1. Methodology

Sample; Following the observations made in Chapter 7.4.2., a single company, Company XXII, was approached for the empirical research. A short description of Company XXII is provided in Appendix XXXVI. Data sampling for a subsequent Study 11 was performed December 2004 – January 2005. However, the data obtained from this sampling did not allow for a verification of the single concept in relation to concepts operationalizing both Conditions and factor scores capturing the Process of Motivation, as these data were omitted from the questionnaire used at the time. Company XXII was therefore approached a second time at the end of 2007, to allow for these supplemental analyses. The Company graciously allowed for a number of questions to be supplemented to a questionnaire handed out in January 2008.

A random sample was taken at the three locations corresponding to the three locations where the previous data samples were taken, as described in Study 11, Chapter 7.5.2.1.

Details of this second data sample enabling the supplemental Preliminary Analyses in the present Study, are provided in Table 7.1.

		Original Sample		
	Sampling date	*n*	*N*	*Response*
		Abs	Abs	%
Netherlands				
1 *Company XXII*				
Location 01	*01-2008*	43	45	95.6%
Location 02	*01-2008*	48	50	96.0%
Location 03	*01-2008*	69	75	92.0%
	Totals	160	170	94.1%

Notes:
Sub samples consisted of Business Units within larger company

Table 7.1.
Summarized sampling characteristics of the Preliminary Analyses Research sample

Procedure; Questionnaires containing evaluative items on a training program were

supplemented with questions capturing the targeted Conditions, the single concept and the HF2.01 questionnaire used to generate the factor scores associated to components DEDICAT and ACHIEV. The resulting questionnaire was handed out to a random sample of populations at the three locations, targeted earlier in the analysis of the Study 11 data.

Measures; As stated in Chapter 7.4.1.1., a single concept was assumed to represent not only specific targeted Conditions, but also to capture in broader terms the occurrence of a successful Intervention.

In a two-fold verification, to this aim, following constructs were defined:

- *Single concept:* As indicated Chapter 7.3., and detailed in Chapter 7.4.3., the concept was to center on the objective the Conditions are aiming at: an Intervention which successfully interferes within the Process of Motivation. In capturing the single concept, a question was formulated following the guiding principle in phrasing of questions elaborated on earlier in Chapter 6.5.1.2.II., where the respondent was asked to evaluate a status quo in terms of a qualification or perceived satisfaction, with the Intervention performed by an External-Actor.

The dependent variable meeting these criteria, was defined as follows[1]:

- Variable CAPTURED_CONDITIONS, consisting of a single item referenced as: Suppl-a

For a description of the item, reference is made to Appendix XXXV.

- *Conditions.* Following the exposé in Chapter 7.4.3., two Conditions were to be targeted: Conditions of Perceived Support and of Perceived (Mis)-Match in Mutual Perceptions. Both Conditions, as independent variables in Study 10, were defined as follows:

- Condition PERCEIVED_MATCH, consisting of items referenced as: Suppl-b, Suppl-c
- Condition PERCEIVED_SUPPORT, consisting of items referenced as: Suppl-d, Suppl-e

For a full description of items and references, see Appendix XXXV.

- *Process of Motivation.* The Process of Motivation was captured using the outcomes of Chapter 5, with components DEDICAT and ACHIEV represented by their respective factor scores, with essential items defined as follows:

[1] Strictly speaking, as no controlled experiment was performed, the concept of a dependent and independent variable is inaccurate in regression analysis. Instead, variables are measured simultaneously and without strict control (Field, 2005). However, in adapting to current practice, the concepts are used to designate response or outcome variable versus explanatory or predictor variables.

- Component DEDICAT, consisting of items referenced as: ce, cf, cg, ci, cs, ct, dz and eb from questionnaire HF 2.01
- Component ACHIEV, consisting of items referenced as: at, au, av, ba, bb and bc from HF 2.01

For a full description of these references used in designating items, see Appendix III, Section B., or Table 5.3., for an abridged overview. The HF-2.01 questionnaire was used to generate factor scores associated to components DEDICAT and ACHIEV, as described in Chapter 5.7.1.1., summarized in Chapter 5.7.2.

Analysis; Following Chapter 7.4.1.1., the Preliminary Analyses were performed in two phases:

- A regression analysis was performed to assess the relationship between the variable CAPTURED_CONDITIONS as dependent or response variable, and both Conditions PERCEIVED_MATCH and PERCEIVED_SUPPORT separately, each with their distinct explanatory variables. In the analysis a distinction was made between both Conditions, as in the subsequent Study 11 the response variable was assumed to represent each Condition separately, in its own distinct properties.
- A simple regression was performed with a standard Pearson product-moment correlation to assess the relationship between variable CAPTURED_CONDITIONS and both factor scores DEDICAT and ACHIEV capturing Motivation. In the analysis a distinction was made between both factor scores, following conclusions made in Chapter 5.5.3., as both were assumed to represent a distinct aspect in the Process of Motivation, in its own distinct properties. Factor scores were defined following the methodology described in Chapter 5.7.1.1. and summarized in Chapter 5.7.2.

Correlations were considered to be valid in defining an assumed relation, when significant at a standard $p<.05$ level, following criteria set in Chapter 7.4.1.1.

All assessments were made using standard SPSS procedures (Norusis, 1990).

2. Results

I. Conditions

The data-set obtained from a renewed sampling in 2008, consisted of three sets obtained at three locations, in parallel to the 2005 data used in Study 11. With a total sample of n=160, a preliminary criterion for sampling size, defined Chapter 7.4.2., was met. A Cronbach alpha for the Suppl-a through Suppl-e variable set was obtained of .62, indicating a moderately adequate reliability (Kline, 1999)[1].

[1] A moderate reliability was obtained, probably due to the limited number of items in the variable set (Cortina, 1993).

Variables			Regression Analysis (3) (4)				(5)
	Ref. (1)	Item (2)	R^2	F (6)	β	t (6)	
1.	Condition: Perceived Match		.071	5.77 **			
	Suppl-b	Company goal interference			-.22	-2.70 **	
	Suppl-c	Changing personal goals			-.11	-1.41	
2.	Condition: Perceived Support		.558	98.35 ***			
	Suppl-d	Performance manager			.59	9.83 ***	
	Suppl-e	Recognition manager			-.26	-4.38 ***	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix XXXV
(3) Data sample n = 160 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is regressed on variables Suppl-b and Suppl-c in Section 1, on variables Suppl-d and Suppl-e in Section 2
(5) R^2 = Multiple correlation coefficient F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
(6) * Statistic significant at the 0.05 level.
** Statistic significant at the 0.01 level.
*** Statistic significant at the 0.001 level.

Table 7.2.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on Condition PERCEIVED_MATCH in Section 1, on Condition PERCEIVED_SUPPORT in Section 2

An overview of descriptive statistics for the selected variables is provided in Appendix XXXVII, an overview of inter-item correlations in Appendix XXXVIII.

Table 7.2. contains an overview of the regression analysis performed, where the single concept variable CAPTURED_CONDITIONS was regressed on a set of two variables operationalizing PERCEIVED_MATCH, i.e. Suppl-b and Suppl-c in Section 1, and a second set of variables operationalizing PERCEIVED_SUPPORT, i.e. Suppl-d and Suppl-e in Section 2.

To assess the relation between the Condition of a Perceived Match, and the single concept variable, CAPTURED_CONDITIONS was regressed onto Suppl-b and Suppl_c. With no inter-item correlations >.9 between explanatory variables, no indications of multi-collinearity were found (Appendix XXXVIII), with Tolerance and VIF values well within limits initially defined in Chapter 7.4.1.1[1]. With only two explanatory variables, the Durbin-Watson was slightly below standard, although at an acceptable level at 1.73. The Multiple correlation coefficient provided a good estimate of the proportion of variance in the single concept variable, explained by the linear regression. The model explained 7 percent of variance, R^2=.071, with p<.01, thus meeting criteria initially set in Chapter 7.4.1.1. The respective explanatory variables, however, contributed differently to these

[1] For both explanatory variables VIF values were 1.05, the Tolerance statistic .95.

outcomes. Variable Suppl-b differed significantly from zero, with a Standardized β coefficient -.22, thus providing a significant contribution, whereas Suppl-c, with a β coefficient -.11 only, did not contribute significantly. Although the number of explanatory variables was very limited in this first analysis, these findings justified analysis of the larger total sample size, based on Green's indications elaborated on earlier in Chapter 7.4.2 [1]. However, as a consequence, no further analyses were performed involving smaller sub-samples at Locations 01, 02 and 03.

In Section 2, the single concept variable was regressed onto Suppl-d and Suppl-e, capturing the Condition of Perceived Support. Inter-item correlations were substantially higher, but no indications of multicollinearity were found (Appendix XXXVIII), with Tolerance and VIF values within limits defined[2]. The Durbin-Watson test provided no indication of correlated residuals for any two observations, with a 2.02 score. A high Multiple correlation coefficient was obtained, R^2=.558, with an F-ratio significant at p<.001, thus meeting criteria initially set. Explanatory variables yielded high Standardized β values, .59 for Suppl-d, -.26 for Suppl-e, both demonstrating significant effects on the single concept variable. These findings, however, justified a further analysis involving smaller samples. Appendix XXXIX contains the outcomes obtained from the three sub-samples at their respective locations[3]. R^2 varies between .476 and .681, with F-ratio's significant at p<.001, indicating the linear regression equation significantly improved predicting the outcome. However, within these smaller sub-samples, the contribution of variable Suppl-e appeared to be less prominent than variable Suppl-d, with β values differing significantly from zero within all sub-samples at p<.001.

Summarizing, first findings from a Preliminary Analysis where the single concept variable CAPTURED_CONDITIONS was regressed onto two sets of explanatory variables capturing Conditions PERCEIVED_MATCH and PERCEIVED_SUPPORT, seem to support the initial assumptions made in Chapter 7.4.3. of a relation existing between these Conditions and the single concept as outcome variable.

[1] Where $n \geq (8/f^2) + (k - 1)$, with $f^2 = R^2 / (1 - R^2)$, an adequate sample size would be $n \geq 105$ (Green, 1991).

[2] For both variables Suppl-d and Suppl-e VIF values were 1.27, the Tolerance statistic .79.

[3] The distinct sub-sample sizes are, however, still large according to Green's theorem: with $f^2 = R^2 / (1 - R^2)$, extrapolated an adequate sample size would be $n \geq 8$ (Green, 1991).

Variables		Regression Analysis (3) (4)				(5)
Ref. (1)	(2)	R^2	F (6)	β	t (6)	
1. Motivation: component DEDICAT		.099	17.30 ***			
DEDICAT	Factor score			-.31	-4.16 ***	
2. Motivation: component ACHIEV		.012	1.97			
ACHIEV	Factor score			.11	1.40	

Notes:
(1) Reference used
(2) Factor scores capturing the Process of Motivation; for a summarized overview refer to Chapter 5.5.3.
(3) Data sample n = 160 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is regressed on factor scores DEDICAT in Section 1, and ACHIEV in Section 2
(5) R^2 = Multiple correlation coefficient F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.3.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on factor score DEDICAT in Section 1, on factor score ACHIEV in Section 2

II. The Process of Motivation

The HF2.01 questionnaire was used on the n=160 sample, to provide data for a second Preliminary Analysis. A Cronbach alpha was obtained of .79 on this data-set, indicating an adequate reliability (Kline, 1999)[1].

Table 7.3. presents an overview of the second regression analysis, where the single concept variable CAPTURED_CONDITIONS was regressed on factor score DEDICAT in Section 1, and on factor score ACHIEV in Section 2.

In the single variable regression analysis, R^2 becomes the squared Pearson product-moment correlation coefficient *r*, as indicated Chapter 7.4.1.1. With R^2=.099, factor score DEDICAT accounted for almost 10% of the variation in the single concept variable[2]. The F-ratio for the regression equation was significant at p<.001. The associated β value differed significantly from zero, and thus provided a significant contribution to the outcome.

[1] A single variable, referenced as variable aj (see Appendix III, Section B.), was omitted from the listing as it greatly reduced reliability scores. The variable had a minor influence both on factor scores DEDICAT and ACHIEV, with a factor score coefficient of 0.011 and –0.006 respectively, in defining the final factor score as set forth in Chapter 5.7.1.1.

[2] No multicollinearity tests are performed, as, per definition, in the regression only a single explanatory variable is observed.

The analysis of factor score ACHIEV provided no evidence of a significant relation. With R^2=.012, ACHIEV accounted for only 1.2% of variation in the single concept variable, and consequently the F-ratio failed to be significant, as was the associated β value.

These findings, where the single concept variable CAPTURED_CONDITIONS was regressed onto factor scores DEDICAT and ACHIEV, suggest that a relation exists between the concept and the Process of Motivation captured in component DEDICAT, but that no relation seems apparent with component ACHIEV. These outcomes are in line with assumptions made in Chapter 7.4.3.

3. Discussion

Although not all explanatory variables appeared to provide a significant contribution, the single concept variable suggested in Chapter 7.3., and detailed in Chapter 7.4.3., was significantly correlated to the two Conditions it was meant to represent. Moreover, a relation with component DEDICAT, capturing Motivation, appeared to be evident.

However, despite these findings, a number of limitations are to be reiterated prior to formulating first conclusions.

Foremost, the sample had a limited representativity, with only one company involved, at three Western-European locations.

Despite these limitations, the size of the sample could still have been too large, in cases where large correlations were obtained causing excessive power as a result of the sample containing too many subjects. Although the analysis provided in a reduction of the sampling size, these effects could have influenced outcomes.

Finally, limitations apply as a result of using questionnaire HF2.01, elaborated on earlier notably Chapter 5.5.1.3., and of the phrasing used in defining both explanatory and outcome variables.

4. Conclusion

The Preliminary Analysis aimed at verifying the relation between the single concept and the two Conditions it was to capture in subsequent descriptive research: Conditions of Perceived (Mis)-Match in Mutual Perceptions and of Perceived Support. Moreover the analysis was to verify the relation, especially with DEDICAT, capturing the Process of Motivation.

The results of both sets of analyses provide support for these relations and justify the use of the single concept suggested in Chapter 7.3., and detailed in Chapter 7.4.3., as outcome variable in a next stage of the empirical research.

7.5.2. Study 11: Regression Analyses

After having verified the representational properties of the single concept that is assumed to capture the Conditions initiating an effective Intervention in the Process of Motivation, the present Study is to verify the relation of the concept with two sets of explanatory variables capturing the Attitudinal and Technical Competencies associated to both Extrinsic and Intrinsic Intervention Modalities.

As such, Study 11 aims at a verification of hypotheses H1A, H1B, and H2A, H2B, as defined Chapter 7.4.3.

Reflecting on both sets of hypotheses it is noted that a distinction is made in Extrinsic and Intrinsic Intervention Competencies, following the observations from Chapter 7.4.3., where both are considered to be distinct Modalities in Management of Motivation. Within each Modality the Attitudinal and Technical Competencies will be observed in both distinct and combined settings.

1. Methodology

Sample; A single company, Company XXII, was approached, following the observations made in Chapter 7.4.2., with diverse operational activities situated at distinct locations. Data sampling was performed during December 2004 – January 2005.

A short description of Company XXII is provided in Appendix XXXVI. A sample was taken at three locations, reflecting divergence in operational activities. Details are provided in Table 7.4.

		Original Sample		
	Sampling date	n	N	Response
		Abs	Abs	%
Netherlands				
1 Company XXII				
Location 01	12-2004	247	263	93.9%
Location 02	12-2004	188	251	74.9%
Location 03	12-2004	115	118	97.5%
	Totals	550	632	87.0%

Notes:
Sub samples consisted of Business Units within larger company

Table 7.4.
Summarized sampling characteristics of the Regression Analyses Research sample

Procedure; Questionnaires were handed out containing items capturing the single concept and items operationalizing the Attitudinal and Technical Competencies, covering both Extrinsic and Intrinsic Modalities. The questionnaire containing the items was handed out to the entire population at the three locations of Company XXII, participating in the Study. A classroom setting was used, yielding a 87% response on average.

Measures; A single concept was assumed to represent the two specific Conditions that are addressed by Attitudinal and Technical Competencies, in two distinct Modalities. The regression analyses were aimed at obtaining a descriptive evidence of the assumed relation between the single concept and two sets of explanatory variables capturing these Attitudinal and Technical Competencies associated to both Extrinsic and Intrinsic Modalities.

Following a scheme suggested in Chapter 7.4.1.2., to this end, following constructs were defined:

- *Single concept:* Following the outcomes of Study 10, a single concept was found to be indicative of the two targeted Conditions, called for in the Problem Statement, aimed at initiating a successful Intervention in the Process of Motivation.

The dependent variable that appeared to meet these criteria, was defined as follows:

- Variable CAPTURED_CONDITIONS, consisting of a single item referenced as: Suppl-a

In formulating the concept, reference is made to Chapter 7.5.1.1., for a description of the item, see Appendix XXXV, restated in Appendix XL, Appendix XLV, Appendix L and Appendix LV.

- *Extrinsic Attitudinal Competencies.* Following the overview in Chapter 7.2.2., a single Extrinsic Attitudinal Competency was defined. The Competency was considered to be the independent variable in the first regression analysis of Study 11, and was defined as follows:

- Extrinsic Attitudinal Competency, consisting of:
  - Extrinsic Attitudinal Competency 1, *Dignity,* consisting of items referenced as: Suppl-n, Suppl-o

For a full description of these referenced items, see Appendix XL.

- *Extrinsic Technical Competencies.* Following the overview in Chapter 7.2.2., four Extrinsic Technical Competencies were defined. These four Competencies were analyzed as independent variables in the second regression analysis of Study 11, and were defined as follows:

- Extrinsic Technical Competencies, consisting of:
  - Extrinsic Technical Competency 1, *a Technical Competency of Providing Extrinsic Preconditions,* consisting of items referenced as: Suppl-f, Suppl-g

- Extrinsic Technical Competency 2, *a Technical Competency of Clarifying Extrinsic Outcomes,* consisting of items referenced as: Suppl-h, Suppl-i
- Extrinsic Technical Competency 3, *a Technical Competency of Providing Active Assistance,* consisting of items referenced as: Suppl-j, Suppl-k
- Extrinsic Technical Competency 4, *a Technical Competency of Providing Active Feedback,* consisting of items referenced as: Suppl-l, Suppl-m

For a full description of these items and references, see Appendix XLV.

- *Intrinsic Attitudinal Competencies.* Following the overview in Chapter 7.2.2., three Intrinsic Attitudinal Competencies were defined. These three Competencies were considered to be the independent variables in the third regression analysis of Study 11, and were defined as follows:

- Intrinsic Attitudinal Competencies, consisting of:
  - Intrinsic Attitudinal Competency 1, *Respect*, consisting of a single item referenced as: Suppl-w
  - Intrinsic Attitudinal Competency 2, *Dignity,* consisting of items referenced as: Suppl-n, Suppl-o, as mentioned under Extrinsic Attitudinal Compentency 1
  - Intrinsic Attitudinal Competency 3, *Trust,* consisting of a single item referenced as: Suppl-x

For a full description of these items and references, see Appendix L.

- *Intrinsic Technical Competencies.* Following the overview in Chapter 7.2.2., four Intrinsic Technical Competencies were to be targeted. These four Competencies were analyzed as independent variables in the fourth regression analysis of Study 11, and were defined as follows:

- Intrinsic Technical Competencies, consisting of:
  - Intrinsic Technical Competency 1, *a Technical Competency of Clarifying Intrinsic Preconditions,* consisting of items referenced as: Suppl-p, Suppl-q, Suppl-r
  - Intrinsic Technical Competency 2, *a Technical Competency of Clarifying Intrinsic Outcomes,* consisting of a single item referenced as: Suppl-s
  - Intrinsic Technical Competency 3, *a Technical Competency of Providing Passive Assistance,* consisting of items referenced as: Suppl-t, Suppl-u
  - Intrinsic Technical Competency 4, *a Technical Competency of Providing Passive Feedback,* consisting of a single item referenced as: Suppl-v

For a full description of these items and references, see Appendix LV.

Analysis; With the two sets of hypotheses *H1A, H1B* and *H2A, H2B* to be verified according to Chapter 7.4.3., and following a distinction made in both Extrinsic and Intrinsic Intervention Competencies, a following scheme for the regression analyses was used, following observations made in Chapter 7.4.1.2.:

- Regression analysis Extrinsic Intervention Competencies:
  - Regression analysis Attitudinal Competency

- Regression analysis Technical Competencies
- Regression analysis Attitudinal & Technical Competencies

- Regression analysis Intrinsic Intervention Competencies:
  - Regression analysis Attitudinal Competencies
  - Regression analysis Technical Competencies
  - Regression analysis Attitudinal & Technical Competencies

Following criteria set in Chapter 7.4.1.2., a t-test was performed on all Standardized β's. A significant difference from zero was to exceed $p<.05$. In addition, a Multiple correlation coefficient R^2 was to assess the regression equation in a more general sense, with the equation considered to have provided a significant improvement in the ability to predict the response variable when the F-ratio was significant at $p<.05$. An additional ΔR^2 was reported in the hierarchical regressions. To assess significance in the observed change an analysis of variance was performed with significance levels set at $p<.05$.

All assessments were made using standard SPSS procedures (Norusis, 1990).

2. Results

The regression analyses were aimed to fit a predictive linear model to the data, and to use the model to predict values of the dependent variable Suppl-a from the set of independent predictor variables representing the Attitudinal and Technical Competencies in both Extrinsic and Intrinsic Modalities.

The data-set consisted of three sets obtained at three locations within Company XXII. Total sample size was n=550, with an average response exceeding 85%, thus meeting criteria set in Chapter 7.4.2.

I. Extrinsic Attitudinal Competency

In analyzing the single Extrinsic Attitudinal Competency a Cronbach alpha was obtained from variables Suppl-a, Suppl-n and Suppl-o of .86, indicating a high reliability of the data-set (Kline, 1999). A full description of these items is provided in Appendix XL, introductory descriptive statistics are provided in Appendix XLI, with inter-item correlations in Appendix XLII.

Results of the regression analysis are presented in Table 7.5., where the single concept variable was regressed on a set of two variables, Suppl-n and Suppl-o, operationalizing the single Extrinsic Attitudinal Competency, Dignity.

Variables			Regression Analysis (3) (4)				
	Ref. (1)	Item (2)	R^2	F (6)	β	t (6)	(5)
1.	Attitudinal Competency 1		.580	363.73 ***			
	Suppl-n	Appreciation contribution			.55	12.89 ***	
	Suppl-o	Appreciation			.25	5.86 ***	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix XL
(3) Data sample n = 530 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is regressed on variables Suppl-n and Suppl-o
(5) R^2 = Multiple correlation coefficient F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.5.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on the single Extrinsic Attitudinal Competency

Following the inter-item correlation matrix, no indications of multi-collinearity were found. Tolerance and VIF values were well within limits initially set in Chapter 7.4.1.1 [1]. The Durbin-Watson statistic 2.04 was close to a standard 2. According to Table 7.5., both variables, operationalizing the Attitudinal Competency correlated highly with the single concept analyzed in Study 10, Chapter 7.5.1., capturing the essential Conditions for Motivation to occur: R^2=.580 ($p<.001$).

In an analysis of both explanatory variables Suppl-n and Suppl-o, both appeared to contribute significantly to the model ($p<.001$).

These findings were confirmed in an additional analysis on reduced sample sizes, following observations referred to earlier by Green in Chapter 7.4.2., with reference to Appendix XLIV[2]. At all three distinct locations of the data-set, both parameters contributed significantly, with variable Suppl-n providing highest contributions with β-values around .55, as compared to around .25 for Suppl-o.

In summary, the single Extrinsic Attitudinal Competency appeared to contribute significantly to the model, both in general terms (R^2=.580, $p<.001$), and in observations of distinct explanatory variables, thus supporting hypothesis H1A, as defined Chapter 7.4.3.

[1] For the Extrinsic Attitudinal Competency explanatory variables, a VIF value 2.32 was obtained for Suppl-n and Suppl-o, the Tolerance statistic was .43.

[2] An overview of associated inter-item correlations is provided Appendix XLIII.

Variables			Regression Analysis (3) (4)					(5)
	Ref. (1)	Item (2)	R^2	ΔR^2	F (6)	β	t (6)	
1.	Step 1: Technical Competency 1		.137		39.76 ***			
	Suppl-f	Salary				.20	4.50 ***	
	Suppl-g	Clarity guidelines/proc				.25	5.59 ***	
2.	Step 2: Technical Competency 1 and 2		.606	.469	192.05 ***			
	Suppl-f	Salary				.05	1.73	
	Suppl-g	Clarity guidelines/proc				.04	1.14	
	Suppl-h	Indicating objectives				.42	8.86 ***	
	Suppl-i	Indicating priorities				.37	7.92 ***	
3.	Step 3: Technical Competency 1, 2 and 3		.715	.109	207.82 ***			
	Suppl-f	Salary				.01	.43	
	Suppl-g	Clarity guidelines/proc				.05	1.69	
	Suppl-h	Indicating objectives				.18	4.18 ***	
	Suppl-i	Indicating priorities				.13	2.93 **	
	Suppl-j	Delegating tasks				.29	6.78 ***	
	Suppl-k	Acknowledging contrib				.32	8.93 ***	
4.	Step 4: Technical Competency 1, 2, 3 and 4		.726	.011	164.00 ***			
	Suppl-f	Salary				.00	.02	
	Suppl-g	Clarity guidelines/proc				.02	.64	
	Suppl-h	Indicating objectives				.17	3.86 ***	
	Suppl-i	Indicating priorities				.10	2.21 *	
	Suppl-j	Delegating tasks				.27	6.46 ***	
	Suppl-k	Acknowledging contrib				.30	8.38 ***	
	Suppl-l	Performance feedback				.04	1.14	
	Suppl-m	Defining pers strengths				.12	3.56 ***	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix XLV
(3) Data sample n = 505 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is hierarchically regressed on variables Suppl-f to Suppl-m through Steps 1 to 4
(5) R^2 = Multiple correlation coefficient ΔR^2 = Change statistic of R^2 F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.6.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on Extrinsic Technical Competencies in a stepwise hierarchical procedure including successive Competencies

II. Extrinsic Technical Competencies

From the data, a Cronbach alpha was obtained for the Suppl-a, Suppl-f through Suppl-m variable set of .90, indicating a high reliability (Kline, 1999). A full description of these items is provided in Appendix XLV. An overview of descriptive statistics for these variables is provided in Appendix XLVI, with an overview of inter-item correlations in Appendix XLVII.

Table 7.6. contains an overview of the regression analysis performed, where the

single concept variable CAPTURED_CONDITIONS was regressed hierarchically on four sets of variables operationalizing the four Extrinsic Technical Competencies, i.e. Suppl-f through Suppl-m.

In a preliminary analysis of the data, no indications of multi-collinearity were found with inter-item correlations <.90 between explanatory variables (Appendix XLVII), with Tolerance and VIF values well within limits, as initially defined in Chapter 7.4.1.1.[1]. The Durbin-Watson was at a standard 2.08. In Table 7.6., Step 1 refers to the first stage in the hierarchy when only Extrinsic Technical Competency 1 was observed. The R^2 at this stage was a modest .137. When Extrinsic Competency 2 was included in stage 2, the statistic increased considerably with .469 to .606, accounting for more than 60% of total variance. The inclusion of this second Competency, explaining a large amount of the variation in the dependent variable, remained prominent throughout stages 3 and 4. Stage 3 increased ΔR^2 by more than 10%, with stage 4 providing a slight increment towards a final R^2=.726, with $p<.001$, thus meeting criteria initially set in Chapter 7.4.1.2. The Multiple correlation coefficient provided an excellent estimate of the proportion of variance in the single concept variable, explained by the linear regression. The analysis of variance testing the predictive or explanatory abilities of the model as compared to a mean value, were significant at every stage of each respective model ($p<.001$). However, the modest contribution of Competencies 1 and 4 found earlier, was reaffirmed in the F-ratio's of each successive model, slightly decreasing from 207.82 to 164.00 in the final model. Nonetheless, all models significantly improved the ability to predict or explain the outcome variable.

These findings were confirmed in the observations of the model parameters, where variables Suppl-f and Suppl-g operationalizing Extrinsic Technical Competency 1, only provided a significant contribution as parameters in the first model. The contribution of variables Suppl-h and Suppl-i operationalizing Competency 2, Suppl-j and Suppl-k operationalizing Competency 3, and Suppl-m operationalizing Competency 3 were all significant to the model, providing support for the assumption that these three Extrinsic Technical Competencies are all relevant explanatory entities to the outcome variable.

Based on Green's indications elaborated on earlier in Chapter 7.4.2, these findings suggested to perform a further observation on a reduced sample size (Green, 1991). Referring to Appendix XLIX the significant fit of the model to the overall data, and the relatively large contributions of Suppl-h, Suppl-j, and Suppl-k could be confirmed, whereas other findings were not or only partially supported within these reduced data-sets, necessitating further research into these venues[2].

[1] For the Extrinsic Technical Competency explanatory variables in Step 4 of the hierarchical regression, VIF values ranged from 3.47 to 1.23, the Tolerance statistic from .82 to .29.

[2] An overview of inter-item correlations per location is provided Appendix XLVIII.

Variables		Regression Analysis (3) (4)				
Ref. (1)	Item (2)	R^2	F (6)	β	t (6)	(5)
Attitudinal & Technical Competencies		.736	136.81 ***			
Suppl-f	Salary			-.01	-.37	
Suppl-g	Clarity guidelines/proc			.02	.69	
Suppl-h	Indicating objectives			.13	3.02	**
Suppl-i	Indicating priorities			.10	2.34	*
Suppl-j	Delegating tasks			.26	6.17	***
Suppl-k	Acknowledging contrib			.20	4.60	***
Suppl-l	Performance feedback			.02	.67	
Suppl-m	Defining pers strengths			.10	3.12	**
Suppl-n	Appreciation contribution			.13	2.99	**
Suppl-o	Appreciation			.07	1.74	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix XL and XLV
(3) Data sample n = 501 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is regressed on variables Suppl-f to Suppl-o
(5) R^2 = Multiple correlation coefficient F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.7.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on both Extrinsic Attitudinal and Extrinsic Technical Competencies

To summarize, not all parameters contributed in a same amount to the final outcomes, but they all did contribute significantly at predicting the outcome, where the model provided a significant fit of the data overall, with R^2=.726, p<.001. As such, hypothesis H1B, defined Chapter 7.4.3., appeared to be supported with the observation that in separate contributions of the Extrinsic Technical Competencies, Competencies 2, 3 and 4 were each found to provide a significant contribution to predicting, or explaining the outcome, whereas such evidence was gradually less prominent in the hierarchical regression for Extrinsic Technical Competency 1.

III. Extrinsic Attitudinal and Technical Competencies

Conclusions summarizing findings for the Attitudinal Competency were confirmed in a combined analysis of both Attitudinal and Technical Extrinsic Competencies. Table 7.7 provides an overview of the regression analysis, where the single concept variable CAPTURED_CONDITIONS was regressed on a combined set of variables representing the single Extrinsic Attitudinal Competency and the four Extrinsic Technical Competencies. Although the correlation coefficient increased only from .726 to .736, accounting for 1% of total variance, a contribution of the Attitude parameter represented by variable Suppl-n remained significant. However, given

these figures, and the ones obtained earlier in Table 7.5., it was assumed the Attitudinal component appeared to have had a considerable overlap in the total proportion of variance accounted for.

IV. Intrinsic Attitudinal Competencies

A hierarchical regression analysis was made to analyze effects of the Intrinsic Attitudinal Competencies, Respect, Dignity and Trust. A full description of the items used, is provided in Appendix L, with an overview of prominent descriptive statistics in Appendix LI and inter-item correlations in Appendix LII. In analyzing these items a Cronbach alpha was obtained of .94, indicating a high reliability of the data-set (Kline, 1999).

Results of this fourth regression analysis are presented in Table 7.8., where the single concept variable was regressed hierarchically on the three sets of variables operationalizing the three Intrinsic Attitudinal Competencies.

With these Attitudes conceptually in close proximity of each other, some cause for concern of multi-collinearity was given following the analysis of inter-item correlations with data approaching the .9 criterion set earlier in Chapter 7.4.1.1. However, with Tolerance and VIF values well within limits initially defined in Chapter 7.4.1.1.[1], the data appeared to be acceptable for further analysis. The Durbin-Watson was at a standard 2.01. In Table 7.8., Step 1 refers to the first stage in the hierarchy when only Intrinsic Attitudinal Competency 1 was observed. The single parameter in itself accounted with R^2=.518 for more than 50% of total variance. Although a subsequent introduction of Attitudinal Competencies 2 and especially 3, did not alter these values considerably, the explanatory abilities of the model as compared to a mean value, remained significant at each stage ($p<.001$). As such, all models significantly improved the ability to predict or explain the outcome variable.

The prominent effects of Attitudinal Competency 1, appeared to be reduced in subsequent stages, suggesting an overlap in variance accounted for. High values in inter-item correlations found earlier, indicated a same effect. The inclusion of variables Suppl-n and Suppl-o, in line with earlier findings in the Extrinsic Modality, remained prominent in Step 3, where the single parameter operationalizing Attitudinal Competency 3 provided no further significant contributions to the model.

[1] For the Intrinsic Attitudinal Competency explanatory variables in Step 4 of the hierarchical regression, VIF values ranged from 5.55 to 2.70, the Tolerance statistic from .37 to .18.

Variables			Regression Analysis (3) (4)					(5)
	Ref. (1)	Item (2)	R^2	ΔR^2	F (6)	β	t (6)	
1.	Step 1: Attitudinal Competency 1		.518		564.26 ***			
	Suppl-w	*Respect*				.72	23.75 ***	
2.	Step 2: Attitudinal Competency 1 and 2		.590	.072	251.35 ***			
	Suppl-w	*Respect*				.19	3.13 **	
	Suppl-n	*Appreciation contribution*				.42	7.04 ***	
	Suppl-o	*Appreciation*				.21	4.52 ***	
3.	Step 3: Attitudinal Competency 1, 2 and 3		.592	.002	189.75 ***			
	Suppl-w	*Respect*				.16	2.37 *	
	Suppl-n	*Appreciation contribution*				.39	6.05 ***	
	Suppl-o	*Appreciation*				.19	4.22 ***	
	Suppl-x	*Trust*				.09	1.62	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix L
(3) Data sample n = 527 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is hierarchically regressed on variables Suppl-w, Suppl-n, Suppl-o and Suppl-x through Steps 1 to 3
(5) R^2 = Multiple correlation coefficient ΔR^2 = Change statistic of R^2 F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.8.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on Intrinsic Attitudinal Competencies in a stepwise hierarchical procedure including successive Competencies

High Multiple correlation coefficient values suggested a further analysis on reduced data-sets, following observations from Green mentioned earlier (Green, 1991). The significant fit of the model in the data overall was re-affirmed in the smaller data-sets yielding comparable R^2 values at two locations, and even higher at Location 03, with reference to Appendix LIV[1], whereas the contribution of separate parameters, although significant, diverged from general findings.

In summary, all these Intrinsic Attitudinal Competencies did generate a significant contribution in explaining the outcome variable operationalizing the targeted Conditions enabling Motivation. Hypothesis H2A, as defined in Chapter 7.4.3., was therefore confirmed. However, in a hierarchic analysis, with Respect and Dignity already prominent in their respective effects, no substantial additional contribution for Trust could be observed. However, It is stressed at this point that these data do not indicate that the Intrinsic Attitude of Trust is less important, as the Multiple correlation coefficient of these combined Competencies is significant at predicting,

[1] An overview of inter-item correlations per location is provided Appendix LIII.

or explaining the outcome in relation to a mean value, but rather that the Attitude of Trust fails to add a significant contribution to the effects already obtained by the prominent Attitudinal Competencies of Respect and Dignity.

V. Intrinsic Technical Competencies

The four Technical Competencies used in the Intrinsic Modality, comprised of variables Suppl-p through Suppl-v, an overview of which is provided in Appendix LV, with a summary of descriptive statistics in Appendix LVI and inter-item correlations in Appendix LVII. A Cronbach alpha was obtained on these variables of .92, indicating a high reliability (Kline, 1999).

In the regression the single concept variable CAPTURED_CONDITIONS was regressed hierarchically on four sets of variables operationalizing the four Intrinsic Technical Competencies. Findings are summarized in Table 7.9.

A first overview provided no signs of multi-collinearity, with correlations exceeding .9 between explanatory variables (Appendix LVII). Tolerance and VIF values were within critical limits defined in Chapter 7.4.1.1.[1]. The assumption that errors in the regression are independent was likely met with a Durbin-Watson of 1.99. In Table 7.9., Step 1 refers to the first stage in the hierarchical regression when only the Intrinsic Technical Competency 1 was included in the analysis. Contrary to the findings for the Extrinsic Modality, this first Technical Competency in the Intrinsic Modality seemed to present the most prominent contribution, in accounting for more than 60% of total variance. In subsequent stages, the ΔR^2 statistic increased only marginally from .021, .023 to .003. All Steps in the analysis, however, were indicative of a significant fit of the data overall, with $p<.001$.

The gradual inclusion of parameters associated to the four Technical Competencies, resulted in a successively significant contribution of the distinct explanatory variables, with at least one variable operationalizing each Competency providing a significant contribution to predicting, or explaining, the outcome variable.

A further analysis was performed on reduced data-sets, following Green's observations mentioned in Chapter 7.4.2. The three distinct locations in the data-set were used to this aim. Referring to Appendix LIX[2], a significant fit was observed in all overall data. For the distinct explanatory variables, these findings were reconfirmed in the larger data-sets at Locations 01 and 02, with the exception of Technical Competency 4, whereas at Location 03 with a smaller sample size, these findings diverged from the original observations.

[1] For the Intrinsic Technical Competency explanatory variables in Step 4 of the hierarchical regression, VIF values ranged from 4.06 to 1.23, the Tolerance statistic from .81 to .25.

[2] An overview of the inter-item correlations is provided Appendix LVIII.

	Variables		Regression Analysis (3) (4)					
	Ref. (1)	Item (2)	R^2	ΔR^2	F (6)	β	t (6)	(5)
1.	Step 1: Technical Competency 1		.606		268.50 ***			
	Suppl-p	Listening				.26	5.79 ***	
	Suppl-q	Expressing interest				.19	4.24 ***	
	Suppl-r	Understanding				.40	8.53 ***	
2.	Step 2: Technical Competency 1 and 2		.626	.021	219.30 ***			
	Suppl-p	Listening				.23	5.34 ***	
	Suppl-q	Expressing interest				.15	3.36 ***	
	Suppl-r	Understanding				.31	6.47 ***	
	Suppl-s	Encouraging reflection				.20	5.37 ***	
3.	Step 3: Technical Competency 1, 2 and 3		.650	.023	161.23 ***			
	Suppl-p	Listening				.08	1.62	
	Suppl-q	Expressing interest				.14	3.06 **	
	Suppl-r	Understanding				.28	5.35 ***	
	Suppl-s	Encouraging reflection				.18	4.93 ***	
	Suppl-t	Receptive for suggestions				.27	5.91 ***	
	Suppl-u	Supportive when needed				-.02	-.48	
4.	Step 4: Technical Competency 1, 2, 3 and 4		.653	.003	139.83 ***			
	Suppl-p	Listening				.08	1.52	
	Suppl-q	Expressing interest				.13	2.95 **	
	Suppl-r	Understanding				.28	5.30 ***	
	Suppl-s	Encouraging reflection				.17	4.69 ***	
	Suppl-t	Receptive for suggestions				.26	5.69 ***	
	Suppl-u	Supportive when needed				-.02	-.47	
	Suppl-v	Adhering to agreements				.06	2.16 *	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix LV
(3) Data sample n = 528 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is hierarchically regressed on variables Suppl-p to Suppl-v through Steps 1 to 4
(5) R^2 = Multiple correlation coefficient ΔR^2 = Change statistic of R^2 F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.9.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on Intrinsic Technical Competencies in a stepwise hierarchical procedure including successive Competencies

Summarizing the findings for the Intrinsic Technical Competencies, it appeared that all parameters contributed significantly to explaining the outcome, where the model provided a significant fit of the data overall, with R^2=.653, p<.001. Thus, hypothesis H2B was confirmed where all distinct Intrinsic Technical Competencies where found to provide a significant contribution to predicting, or explaining the outcome, and more than 2/3 of distinct explanatory variables produced significant differences from zero, as defined in criteria set in Chapter 7.4.3.

Variables		Regression Analysis (3) (4)				
Ref. (1)	Item (2)	R^2	F (6)	β	t (6)	(5)
Attitudinal & Technical Competencies		.682	99.25 ***			
Suppl-p	Listening			.04	.83	
Suppl-q	Expressing interest			.09	1.85	
Suppl-r	Understanding			.20	3.83	***
Suppl-s	Encouraging reflection			.16	4.29	***
Suppl-t	Receptive for suggestions			.19	4.11	***
Suppl-u	Supportive when needed			-.03	-.79	
Suppl-v	Adhering to agreements			.05	1.60	
Suppl-w	Respect			.03	.41	
Suppl-n	Appreciation contribution			.23	3.86	***
Suppl-o	Appreciation			-.02	-.36	
Suppl-x	Trust			.06	1.05	

Notes:
(1) Reference used
(2) Abbreviated item; for a full overview of items refer to Appendix L and LV
(3) Data sample n = 522 with listwise deletion of missing values
(4) Response variable: Suppl-a: Encouragement manager to perform
Suppl-a is regressed on variables Suppl-p to Suppl-x
(5) R^2 = Multiple correlation coefficient F = F statistic of the regression analysis
β = Standardized beta coefficient t = t statistic of the beta coefficient
*(6) * Statistic significant at the 0.05 level.*
*** Statistic significant at the 0.01 level.*
*** Statistic significant at the 0.001 level.*

Table 7.10.
Results of Regression Analysis of the single variable CAPTURED_CONDITIONS on both Intrinsic Attitudinal and Intrinsic Technical Competencies

VI. Intrinsic Attitudinal and Technical Competencies

A combined analysis was made of both Attitudinal and Technical Intrinsic Competencies. Table 7.10. provides an overview of the regression analysis, where the single concept variable CAPTURED_CONDITIONS was regressed on a combined set of variables representing the three Intrinsic Attitudinal Competencies and the four Intrinsic Technical Competencies. As in the Extrinsic Modality, the effects of Suppl-n operationalizing Attitudinal Competency 2 remained significant, despite an only minor increase in the R^2 statistic from an original .653 to .682. As compared to Table 7.7, these findings show distinct similarities to the ones obtained for the Extrinsic Modality: significant contributions of the Technical Competencies, accentuated by the Attitudinal Competencies.

3. Discussion

All four hypotheses were found to be confirmed in the analysis of the data, following successive hierarchical regressions of the single concept variable, capturing the two targeted Conditions, on the respective explanatory variables

operationalizing the Attitudinal and Technical Competencies, for both Extrinsic and Intrinsic Modalities.

However, a number of restrictions are challenging these findings.

First and foremost, the sample generating these data was obtained from a single company at a Western-European location. Further replication of these data-sets, not only within different companies with distinct characteristics, but also at different locations worldwide, is needed.

The questionnaire containing the items used to capture variables Suppl-f to Suppl-x, poses restrictions, not only in its design, its handling and presentation, but also in its phrasing and operationalization of the concepts representing the twelve Competencies targeted. In addition, a mis-conceptualization of the single concept, assumed to capture Conditions of Perceived Support and Perceived (Mis)-Match in Mutual Perceptions, would leave results unreliable. These issues have been partly elaborated on in Chapter 7.5.1.3., but need to be mentioned as a possible threat affecting a correct analysis of the data.

Progressing on the high R^2 values found, the data were obtained from larger samples that could have affected these values considerably. In this respect it is also noted that although the observed Competencies were represented significantly in the contributions made towards predicting or explaining the outcome variable, not all parameters used to indicate a single Competency provided a significant contribution.

4. Conclusion

From the data, hypothesis H1A, as defined in Chapter 7.4.3., was confirmed suggesting that the single Extrinsic Attitudinal Competency appeared to be positively related to the single concept capturing the targeted Conditions Perceived Support and Perceived (Mis)-Match in Mutual Perceptions.

Extrinsic Technical Competencies provided a significant contribution to the model, thus confirming hypothesis H1B, defined Chapter 7.4.3. It was noted however, that three of the suggested Extrinsic Technical Competencies contributed significantly to these Conditions, with the exception, however, of the first Competency, where no significant data could be obtained on t-tests performed on separate Standardized β's in these regression analyses[1].

[1] Summarizing from a slightly different perspective, it was found that amongst Extrinsic Technical Competencies, Competencies 2, 3 and 4 provided a significant contribution, with Competency 3, a Technique of Providing Active Assistance, being most prominent in its effects. One might state that an increase by one standard deviation for Suppl-j and Suppl-k operationalizing Extrinsic Technical Competency 3, i.e. an average .9 on a 5-point Likert scale according to Appendix XLVI, appeared to (Continued)

Intrinsic Attitudinal Competencies were found to have similar effects, confirming hypothesis H2A, as defined in Chapter 7.4.3., where it was assumed that these Competencies would be positively related to the single concept capturing both targeted Conditions. However, on t-tests performed on separate Standardized β's, the third Attitudinal Competency failed to provide a significant contribution, possibly as a result of considerable overlap in concepts that were operationalized.

Finally, Hypothesis H2B defined Chapter 7.4.3. was confirmed, where it was assumed that Intrinsic Technical Competencies were contributing significantly in enabling the Conditions favorable to induce Intervention in the Process of Motivation. Similarly, however, not all parameters produced significant results on t-tests performed on separate Standardized β's[1].

7.5.3. *Conclusions*

As a principal outcome, then, of the present Chapter, four Conditions were isolated that were assumed would enable an adequate Intervention in the Process of Motivation, two of which were thought could be targeted by specific Competencies.

In order to avoid co-variation and conceptual overlap, these two Conditions were represented by a single concept that was to capture the objective both Conditions were aiming at: their capability to lead to an Intervention which successfully interferes with the Process of Motivation.

An analysis in Study 10, of the single concept that was suggested, confirmed it to be an adequate representation of both Conditions. Moreover, a significant relation could be established between the concept and the Process of Motivation.

With the single concept variable adequately representing both targeted Conditions, defined as Perceived Support and Perceived (Mis)-Match, Study 11 revealed significant support for the two sets of Competencies suggested in both Extrinsic and Intrinsic Modalities, confirming associated Hypotheses H1A, H1B, and H2A, H2B, respectively.

result in an increase of an average .29 standard deviation in the single concept variable Suppl-a, according to respective β values in Table 7.6. With a standard deviation of the outcome variable of .86, according to Appendix XLVI, this appeared to constitute a change induced by Competency 3 alone of .29 x .86 = .25 on a 5-point Likert scale, assuming all other parameters being constant.

[1] For an Intrinsic Modality, all Technical Competencies appeared to be significant, with a tendency for Technical Competency 1, a Technique of Clarifying Intrinsic Preconditions, to be most important. In a similar approach, an increase by one standard deviation for Suppl-r, being one of three parameters operationalizing Intrinsic Technical Competency 1, i.e. .88 on a 5-point Likert scale (Appendix LVI), appeared to result in an increase of .28 standard deviation in the single concept variable Suppl-a, according to its β value registered in Table. 7.9. With a standard deviation of the outcome variable of .86 according to Appendix LVI, this appeared to result in a .24 change on a 5-point Likert scale, assuming all other parameters constant.

7.6. Summary

Chapter 7 was to produce a descriptive empirical research providing evidence of a relation between concepts presumed to be indicative of Conditions and concepts operationalizing both Extrinsic and Intrinsic Competencies. Both Modalities were assumed to enable Conditions for a successful Intervention to occur, with two Conditions assumed to be essential: Support and a Match in Mutual Perceptions.

In two subsequent analyses these assumptions were verified.

The first study, Study 10, Chapter 7.5.1., aimed at a verification of an important side effect of the approach chosen. In defining concepts or variables capturing a specific Condition and variables operationalizing Competencies, it was expected a considerable co-variation would occur between both variables representing those entities. An alternative method was chosen where, instead of summarizing essential attributes of the two targeted Conditions in a number of distinct concepts, a single concept would be used. Instead of correlating distinct concepts, a single concept was to provide adequate evidence for a correlation between specific Competencies and the occurrence of a successful Intervention, thus avoiding excessive co-variation in expected results. Study 10 was designed to verify the assumed relation, both between the single concept and the two targeted Conditions, and between the single concept and the Process of Motivation. The assumptions formulated at length in Chapter7.5.1.1., were found to be confirmed, with details provided in Chapter 7.5.1.2.

Thus, in Study 11, Chapter 7.5.2., a subsequent analysis could be made to provide evidence for a relation to exist between the single concept that was to represent the occurrence of a successful Intervention and specific concepts operationalizing Attitudinal and Technical Competencies, in both Extrinsic and Intrinsic Modalities. Multiple regression analysis was performed and from the data a confirmation could be obtained for two distinct sets of Competencies in addressing, or 'Management' of Motivation:

- *For an optimal Extrinsic Modality in Management of Motivation:*
  - *A single Extrinsic Attitudinal Competency, defined as:*
    - *An Extrinsic Attitudinal Competency, 'Dignity'*
  - *Four Extrinsic Technical Competencies, defined as:*
    - *A Technical Competency of Providing Extrinsic Preconditions:*
    - *A Technical Competency of Clarifying Extrinsic Outcomes:*
    - *A Technical Competency of Providing Active Assistance:*
    - *A Technical Competency of Providing Active Feedback:*
- *For an optimal Intrinsic Modality in Management of Motivation:*
  - *Three Intrinsic Attitudinal Competencies, defined as:*
    - *An Intrinsic Attitudinal Competency, 'Respect':*
    - *An Intrinsic Attitudinal Competency, 'Dignity':*
    - *An Intrinsic Attitudinal Competency, 'Trust':*
  - *Four Intrinsic Technical Competencies, defined as:*
    - *A Technical Competency of Clarifying Intrinsic Preconditions:*

- *A Technical Competency of Clarifying Intrinsic Outcomes:*
- *A Technical Competency of Providing Passive Assistance:*
- *A Technical Competency of Providing Passive Feedback:*

Four prominent hypotheses were defined in Chapter 7.4.3., to verify the assumed relations between Conditions assumed to be targeted and the various Competencies defined to successfully address these Conditions:

- *In Extrinsic Management of Motivation,*
  - *Confirmation was obtained for hypothesis H1A, assuming that the Extrinsic Attitudinal Competency was significantly related to the single concept capturing targeted Conditions (R^2=.580, F(2,527)=363.73, p<.001).* Referring to Table 7.5. for an overview of Standardized β coefficients, and associated t-tests with respective significance-levels, the single Attitudinal Competency was used as predictor.
  - *Confirmation was obtained for H1B, assuming that the Extrinsic Technical Competencies were significantly related to the single concept capturing the targeted Conditions (R^2=.726, F(8,496)=164.00, p<.001).* Referring to Table 7.6. for an overview of Standardized β coefficients, associated t-tests with respective significance-levels and successive change statistics produced in the hierarchical regression, the four Extrinsic Technical Competencies were used as predictors.
- *In Intrinsic Management of Motivation,*
  - *Confirmation was obtained for hypothesis H2A, assuming that Intrinsic Attitudinal Competencies were significantly related to the concept capturing both targeted Conditions (R^2=.592, F(4,522)=189.75, p<.001).* Referring to Table 7.8. for an overview of Standardized β coefficients, associated t-tests with respective significance-levels and successive change statistics produced in the hierarchical regression, the three Intrinsic Attitudinal Competencies were used as predictors.
  - *Confirmation was found for hypothesis H2B, with the assumption that Intrinsic Technical Competencies were significantly related to the single concept capturing both Conditions (R^2=.653, F(7,520)=139.83, p<.001).* Referring to Table 7.9. for an overview of Standardized β coefficients, associated t-tests with respective significance-levels and successive change statistics produced in the hierarchical regression, the four Intrinsic Technical Competencies were used as predictors.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided evidence for establishing a relation between concepts presumed to be indicative of Conditions enabling Motivation and concepts operationalizing these Competencies.

Providing evidence for these Competencies is the key finding of the third empirical research of this dissertation.

In addition, these findings provide secondary empirical evidence in support of the Model of Motivation, from which these Competencies were derived.

Chapter 8
Empirical Research
Instruments for Competencies Enabling Conditions for Intervention in the Process of Motivation

8.1. Introduction

In Pre-Fundamentals to the study, Chapter 1.5., a reintroduction was proposed of explanatory theoretical Models designed through and originating from an analysis following a process of inductive inference. Where these theoretical Models lead to clearly defined and constrained hypotheses, they constitute not a departure from, but rather a re-enrichment of the hypothetico-deductive tradition. A choice in formulating hypotheses critical to those theoretical Models would provide a means of testing its robustness, with multiple hypotheses adding to its authority.

Thus, in a clear differentiation between inductively inferred theoretical Models and empirically tested deductive findings, through a formulation of hypotheses insights into the Process of Motivation could be obtained, and while extending a choice of hypotheses towards Determinants of a Process of Interference, the elementary processes involved in addressing Motivation could be targeted, in accordance with the Problem Statement defined for the study in Chapter 2.5.

A Model of Motivation was presented, from where Conditions could be formulated assumed to be needed for an Intervention to occur in a Process of Interference. Four Conditions were found to be essential, two of which appeared to provide opportunities best suited for addressing Motivation. In an analysis of Competencies assumed to be essential in initiating these Conditions, two main approaches or Modalities in Management of Motivation were prominent: An Extrinsic Modality and an Intrinsic Modality, each with their own specific characteristics.

In a final empirical research, Chapter 8 is to provide empirical evidence for the third Determinant in the Process of Interference: Instruments for Competencies enabling Conditions for Intervention in the Process of Motivation. Empirical research on its associated hypotheses would constitute a third supplemental verification of the Model.

The objective of Chapter 8 is derived from the Problem Statement defined in Chapter 2.5.:

- *to unveil elementary processes involved in addressing Motivation, by providing insights into the Process of Interference,*
  - *into exemplary Instruments that provide the means for these Competencies to occur, by means of:*
    - *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, provided in a summarized overview,*

- *and empirical research providing evidence for a causal relation to exist between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing these Instruments,*

  thus providing secondary empirical evidence in support of the Model of Motivation, from which these Instruments are derived.

8.2. Application of the Model of Motivation *An Analysis of Instruments*

As mentioned in Chapter 7.2.1., with reference to Appendix XXXIV, Section A., notably A.2., two Modalities emerged in Management of Motivation:

- *An Extrinsic Modality in Management of Motivation:* consisting of four levels of Intervention. The Modality was found to provide substantial opportunities for Control, at the expense, however, of Productivity.
- *An Intrinsic Modality in Management of Motivation:* consisting of four levels of Intervention. The Modality was found to lead to high Productivity, at the expense, however, of only limited opportunities to apply Control.

For each level of Intervention, then, an Instrumentation can be designed. Thus, in Management of Motivation, eight distinct Instruments apply, each addressing Motivation according to specific properties associated to a level of Intervention within a Modality in Management of Motivation.

However, given the Problem Statement, Chapter 2.5., which calls for an *exemplary* Instrument, a single Instrumentation, addressing a single level of Intervention is to be observed in the present study. Referring to Mennes (2016*, in press*), notably Chapter 13, a choice is made for the Intrinsic Modality in Management of Motivation, as virtually no literature appeared to have covered this Modality in addressing Motivation. From the four levels of Intervention, that constitute the Intrinsic Modality, the Intervention level that withholds addressing any Phase (level 8) appeared to yield highest results, and was chosen for the present and final Study.

Before proceeding towards the empirical research, a brief presentation is provided of the theoretical Model leading to the proposed Instrumentation based on the Model of Motivation, in accordance with the Problem Statement. Reference is made to Mennes (2016, *in press*), notably Chapter 12., for an extensive overview.

Prior to the analysis, a brief description of Assumptions is provided.

8.2.1. Assumptions Preceding an Analysis of Instruments

With reference to Appendix LX, Section A., it was assumed that an Instrument was to facilitate a Competency by creating an optimal setting. Thus, in accordance with its definition formulated in Chapter 2.3.2., the analysis was to define specific characteristics,

or properties in those Instruments that would enable the occurrence of an optimal setting.

The analysis of an optimal setting was assumed to include the following four so-called 'Properties':

- *Specification:* a definition of tools, techniques or utilities that enable a specific Intrinsic Intervention Competency to be expressed;
- *Organization:* a definition of structures or procedures that enable a specific Intrinsic Intervention Competency to be deployed;
- *Valuation:* a definition of means, or measures that enable a specific Intrinsic Intervention Competency to be examined and evaluated in its effects;
- *Preservation:* a definition of means, or measures that enable a specific Intrinsic Intervention Competency to be measured, tested and secured.

It was assumed that when each of these four Properties of a setting would be most favorable for the Intrinsic Competencies, an optimal setting would have been achieved.

8.2.2. An Analysis of Instruments

Two distinct Intrinsic Intervention Competencies, presented earlier in Chapter 7.2.2., were to be observed in the analysis for an optimal setting: Intrinsic Attitudinal Competencies, aimed at initiating Support and Intrinsic Technical Competencies, aimed at facilitating a Match in Mutual Perceptions.

Having defined an optimal setting for each of the Properties in relation to each of the Intrinsic Competencies, the inductive inference analysis defined the Instrumentation needed, as an enabling framework, to obtain such an optimal setting. Instruments that were to facilitate Intrinsic Attitudinal Competencies, were referred to as 'Intrinsic Attitudinal Instruments'. Instruments that were to facilitate Intrinsic Technical Competencies, were referred to as 'Intrinsic Technical Instruments'.

For further details on the inductive analysis, reference is made to an abbreviated overview in Appendix LX, Section B.

From the analysis, then, following Instruments emerged:

- *An Intrinsic Attitudinal Instrument:* a training setting provided for the Actor-Intervener, used as a principal vehicle aimed mainly at facilitating Intrinsic Attitudinal Competencies, enabling exposure, practice and experimentation, and providing a framework for evaluation;
- *An Intrinsic Technical Instrument:* a structured interview, provided to the Actor-Intervener aimed mainly at facilitating Intrinsic Technical Competencies, and presented as a written text-book, gradually progressing from a fixed to an open format.

8.2.3. *Conclusions*
Preamble to a Definition of Hypotheses

In Pre-Fundamentals to the study, it is assumed the Model obtained from an analysis of Instruments, as derived from the Model of Motivation, provides an explanatory context from which elementary hypotheses can be derived.

A choice was made for a single, so-called 'exemplary' Instrument, derived from the Model, to be used in the empirical research that is to provide evidence for a causal relation to exist between constructs operationalizing the Process of Motivation and concepts operationalizing these Instruments. The exemplary Instrument, as obtained from Mennes (2016, in press) as an optimal Instrumentation for an Intrinsic Modality in Management of Motivation, is an essential and critical construct derived from the Model of Motivation. Following the observations made in Chapter 1.5., the construct, then, is to be elementary in the formulation of subsequent hypotheses in Chapter 8.4.3

In a verification of the exemplary Instrument, empirical research on these hypotheses is to reflect on the Model of Motivation, from which the Instrument has been derived.

8.3. Operationalization

Two Instruments were derived through an inductive inference analysis, that were assumed to facilitate the Intrinsic Intervention Competencies that would initiate the Conditions deemed essential within an Intrinsic Modality to adequately address the Process of Motivation. A training setting was to facilitate especially the Intrinsic Attitudinal Competencies, and a structured interview was to facilitate mainly the Intrinsic Technical Competencies. Consequently, it is assumed that handling both Instruments would provide an Actor-Intervener with the tools to adequately address Motivation. Thus, exposure to the training setting and application of the structured interview is assumed to produce an effect on the Process of Motivation within an Individual. As the study is restricted to a business environment, as initially indicated in Chapter 2.4.3.3., the training setting and the structured interview are to be designed for a business environment with the empirical validation restricted to an in-company setting.

In Appendix LXI, Section A., a short description of procedures used and an overview of the training setting is presented, referred to as a training 'Management of Motivation'. For reasons of brevity a summary of training materials are provided relevant for an empirical validation. In Appendix LXI, Section B., an overview is provided of a structured interview, designated as 'PM Interview PMI-2.01', and presented in abbreviated format limited to information relevant for an empirical validation. For further overviews, reference is made to Mennes (2016, *in press*), notably Chapter 14.3.

In the empirical validation a registration is to be made of exposure to the training-program and application of the PM Interview PMI-2.01, where both are to be observed on their effects on the Process of Motivation.

8.4. Research Design

The empirical research, then, is aimed at providing evidence for a causal relation to exist between exposure to a specific training setting and application of a specific structured interview, and the occurrence of a successful Intervention within the Process of Motivation.

Thus a single assumption precedes the analysis: it is assumed that a causal relation exists between an application of the Instruments and a successful addressing of the Process of Motivation.

A verification of this assumption, has led to a sequential approach in the original research design presented in Mennes (2016, in press). To obtain evidence of a causal relation, a rationale for establishing cause-and-effect relationships was provided as a framework for the empirical research. This study adheres to common practice within standard literature to establish causality based on a rationale, which has materialized over the years into distinct variations of so-called 'experimental designs'. These experimental designs have a number of distinctive features in common: A group is exposed to an experimental event or variable, the effects of which are measured or observed in a temporal order. A brief overview of the rationale on defining cause-and-effect relations is provided in Appendix LXII, Section A., with reference to the more extensive exposé provided in Mennes (2016, in press), notably Chapter 14.4.

In the overview in the original research, a choice in experimental design was based on criteria of internal, external, construct and statistical conclusion validity, as based on observations following notably Campbell & Stanley (1963), Cook & Campbell, (1979), Shadish, Cook & Campbell (2002), leading to six distinct Studies, as briefly covered in Appendix LXII, Section B., with reference to more detailed overviews in Mennes (2016, in press), notably Chapter 14.4.1. and Chapter 14.4.2. Based on the Problem Statement to provide evidence for a causal relation to exist between concepts operationalizing an exemplary Instrument and constructs operationalizing the Process of Motivation, from these six Studies contained in the original design of experiment, a single study, Study 13, is chosen to represent the empirical research in this dissertation. To complement Study 13, a brief synopsis is provided of Study 12 and Study 14, which were related to Study 13 in the original research Project.

In the design of experiment a Posttest-Only Design Using an Independent Pretest Sample is proposed for Study 13, using separate pretest and posttest sampling groups with 'Diversification in Treatment', providing a distinction in treatments, or a distinction in the exposure of the group to the experimental condition. In both pretest and posttest settings the design of experiment is aimed at establishing evidence for a causal relation to exist between exposure to a specific training setting and application of a specific structured interview, operationalized by both a specific training-program 'Management of Motivation' and a concrete interview, the 'PM Interview PMI-2.01', with Experimental Groups consisting of employees exposed to the structured interview, and Control Groups consisting of unexposed subjects.

8.4.1. Statistics

The Problem Statement calls for evidence of a causal relation between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing two Instruments that are assumed to provide the means for Intrinsic Intervention Competencies to occur.

A most widely used approach to establishing whether cause-and-effect relations exist is through so-called 'null hypothesis significance testing' (Shadish, Cook & Campbell, 2002; Lehmann & Romano, 2005). We will adhere to common practice, and will consider null hypothesis significance testing as the primal approach to establishing a cause-and-effect relation. In recent years, however, the approach has been criticized (Rosnow & Rosenthal, 1989; Cohen, 1990, 1994; Kirk, 1996; Schmidt, 1996; Ziliak & McCloskey, 2008)[1], and distinct suggestions have been made in reporting results (Wilkinson & The Task Force on Statistical Inference, 1999; American Psychological Association, 2001; Gliner, Leech & Morgan, 2002; Shadish, Cook & Campbell, 2002). Following these suggestions, and compensating for a number of potential threats to statistical conclusion validity, results of the Study will be reported using at least three indications:

- *p*-values, considered as exact probability levels of a Type I error from a null hypothesis significance testing
- accompanying effect size estimates
- accompanying 95% confidence intervals

Where relevant, in summarizing these findings in the respective discussions, conclusions and summaries, an abbreviated notation will include the statistic, its p-value or in case of significance the α-value used in establishing its significance, and its effect size estimate. As both effect size estimates and observed significance are presented, no indication of levels of statistical power will be provided, where both estimates give adequate information on the probability levels that the various analyses are able to detect an effect, inherent to an assessment of statistical power.

A series of statistical tools are to assist null hypothesis significance testing in the proposed research design aimed at establishing a cause-and-effect relation.

[1] According to Gliner, Leech & Morgan (2002) the misconceptions appear to be: (...) "(a) that the size of the *p* value indicates the strength of the relationship and (b) that statistical significance implies theoretical or practical significance" (p. 84). Shadish, Cook & Campbell (2002) state: (...) "The arguments (...) reduce to two: (1) scientists routinely misunderstand NHST, believing that *p* describes the chances that the null hypothesis is true (...) and (2) NHST tells us little about the size of an effect. Indeed, some scientists wrongly think that nonsignificance implies a zero effect" (...)(p. 43.), where 'NHST' refers to 'null hypothesis significance testing'.

1. ANOVA

In comparing basically two groups of Independent Pretest Posttest Samples, i.e. control versus experimental hence two levels of the independent variable, two approaches are eminent: a t-test or an analysis of variance (ANOVA). Where a Diversification in Treatment Groups is anticipated, and a method of comparing various Means is sought after, we follow common practice in choosing ANOVA to avoid unacceptable family-wise error rates. The ANOVA procedure is to be performed on both Experimental and Control Groups in respective pretest and posttest settings.

Four important assumptions underlie the ANOVA procedure. First, the dependent variable must be measured on at least an interval scale (Field, 2005). Furthermore, observations must be independent, with data obtained from a normally distributed population; finally, variances in each experimental condition are assumed to be fairly similar (Tabachnick & Fidell, 2001; Rutherford, 2001).

In the analyses, the first two assumptions are to be verified within the various data-sets. A Kolmogorov-Smirnov Test is to verify the assumption of normality in the observed distributions. Most psychological statistical texts, however, report the ANOVA procedure to be robust with respect to violations of the normality assumptions (Box & Andersen, 1955; Hays, 1994; Kirk, 1995; Lindman, 1974; Rutherford, 2001; Winer, Brown & Michels, 1991)[1], enabling a less conservative approach, where within the various Experimental and Control Groups with anticipated moderate sample sizes, a number are expected to deviate from normality (Rutherford, 2001). When sample sizes are comparable and greater than 12 (Clinch & Keselman, 1982; Tan, 1982), the various Groups within the experimental design are assumed to be derived from a population with normal distribution when at least ¾ of these various Groups appear to have a normal distribution according to the Kolmogorov-Smirnov Test. When the assumption is not met, a Kruskal-Wallis non-parametric Test is to be used as an alternative. Finally, in establishing validity of the fourth basic assumption of the ANOVA procedure, Levene's Test for Equality of Variances is to verify the assumption of homogeneity of variance. Where ANOVA seems to be less robust for violations of the homogeneity of variance assumption when sample sizes are unequal (Field, 2005; Glass, Peckham & Sanders, 1972[2]), alternative F-ratios are to be derived. From both alternative procedures provided in SPSS, the Welch F test will be chosen, as the approach appears as best alternative in terms of power (Tomarken & Serlin, 1986; Welch, 1951).

In the ANOVA procedure Motivation is to be captured using factor scores, associated with components DEDICAT and ACHIEV, following conclusions made in Chapter 5.5.3.

[1] Although Wilcox (1995, 1998) argues for negative effects on the power of ANOVA.

[2] Although several authors (Box 1954a, 1954b, Lindman, 1974) provide evidence that the F statistic appears to be quite robust against violations of the homogeneity of variance assumption.

2. One-way Independent ANOVA

The cause-and-effect analysis is to be initiated in the Posttest-Only Design Using an Independent Pretest Sample, with a One-way independent ANOVA test of the pretest posttest Experimental and Control Groups. A comparative introductory analysis of effects is to observe the principal Experimental and Control Groups in pre- and posttest settings. The introductory analysis is to present statistics with Means, Standard Deviations and sample sizes for each group with ANOVA F-ratio's and respective significance levels. As indicators for effect size estimates, Eta squared (η^2) is provided[1]. In contrast to current practice, we adhere to APA standards (APA, 2001; APA, 2010) and an increased appeal in recent publications (Vacha-Haase & Thompson, 2004; Fritz, Morris & Richler, 2012), to provide descriptions of effect size estimates for both significant and non-significant data[2].

3. Planned-Comparison for One-way Indepent ANOVA

Following the introductory analysis of pretest and posttest Experimental Groups, the analysis is to proceed in observing effects of Diversification in Treatment groups by means of a series of appropriate Planned-Comparisons to determine group differences. User-defined orthogonal contrasts are to determine overall and specific Group effects. From these independent contrasts t-tests are to be performed on the B-coefficients representing these contrasts in a multiple regression model where resulting p-values for these orthogonal comparisons are uncorrelated, thus avoiding inflated family-wise error rates. Following the observations made on null hypothesis significance testing, the analysis is to include Means and Standard Deviations for each group, with t-statistics for each contrast with respective significance levels, the contrast estimate B and its associated 95% confidence interval. As indicators for effect size estimates, Eta squared *(η^2)* estimates are provided. Summaries of these main statistics are presented, with reference to full overviews of Contrast Results in separate Appendices. Trend-analyses using polynomial contrasts are provided, restricted however to basic linear trends in the value of the dependent variables across categories.

[1] As Experimental and Control Groups are expected to have different sample sizes, η^2 is used for effect size estimates. However, as η^2 is solely based on sums of squares obtained from the sample, while a population estimate is desired, the statistic is slightly biased. While ω^2 appears to be a better effect size estimate as it also uses the variance explained by the model as one of its parameters, it is suggested the statistic be used only with equal sample sizes (Field, 2005; Howell, 2002).

[2] Although effect size estimates appear less relevant for non-significant effects, reporting effects sizes for all data is needed "for a reader to engage with, think through, and fully consider the implications of the results of a study" (...)(Fritz, Morris & Richler, 2012, p. 15). Moreover, as Vacha-Haase & Thompson (2004) demonstrate, a complete reporting facilitates meta-evaluative analyses of different research findings.

4. Two-way Independent Factorial ANOVA

The analysis in the Posttest-Only Design Using an Independent Pretest Sample is to conclude with a comparison between pretest and posttest situations to provide information on the direction of the effect of the treatment condition. As pretest and posttest samples are independent, the effects of treatment can only be deduced indirectly from the available data. A Two-way independent factorial ANOVA is to evaluate how pre- and posttest variables interact and what effects these interactions have on the observed dependent variables. The cause-and-effect analysis is to include a 2x2 factorial design, where the Experimental and Control Groups are observed on a factor Group (Experimental Group and Control Group) over a factor Time-of-Measure (pretest condition and posttest condition). An analysis is to be performed of the model in general, of its main effects, and of the interaction between both independent variables, where the analysis is to emphasize the model in general and the interaction, as both main effects have been the subject of analysis in previous sections. Where in previous sections the various descriptive statistics have been detailed, this third section is to include only an overview of F-ratio's for the overall model, the main effects and the interaction of the factorial ANOVA and respective significance levels with η^2 as indicator for effect size estimates.

As a supplement to the pretest posttest comparative analysis, Mean scores on the dependent variables, representing the effects on the Process of Motivation in both pre- and post treatment situations, are provided in a graph enabling a visualized summary of the analysis on the direction of the effect following the treatment condition.

In conclusion, outcomes of the various statistical procedures are to be provided for each Group comparison, referring to respective Appendices for reasons of brevity. Significance on all procedures is to meet minimal standards defined at $p<.05$.

All analyses are made using standard SPSS procedures (Norusis, 1990).

8.4.2. Sampling

For an adequate statistical analysis to be performed, a number of criteria are defined in assessing sample size. Following observations made in Chapter 8.4.1.1., for an ANOVA aimed at null hypothesis significance testing, it was assumed the various Groups of observation were to be derived in majority from a normal distribution. From literature it is suggested the assumption of normality is expected to be met when sample sizes are roughly comparable and greater than n=12 (Clinch & Keselman, 1982; Tan, 1982). Following these earlier observations, then, the various Groups within the experimental design are assumed to be roughly comparable with preferable sample sizes exceeding n=12. A normal distribution is to be observed occurring in at least ¾ of Groups as indicated by a Kolmogorov-Smirnov Test.

Overall response percentages in all data-samples are to exceed 70%.

8.4.3. Hypotheses

It is assumed that a causal relation exists between an application of Instruments and a successful addressing of the Process of Motivation. In establishing the cause-and-effect relation null hypothesis significance testing is to be used, where a series of ANOVA procedures on different Groups within the sampling population is to provide confirmation for these assumptions.

Prior to formulating the hypotheses for testing, however, a number of final observations are made.

First, a choice was made for an analysis aimed exclusively at Instruments enabling Intrinsic Intervention Competencies. As a consequence, a final verification of hypotheses is to be performed uniquely aimed at Intrinsic Intervention Competencies.

In a second observation, factor scores DEDICAT and ACHIEV will be used to capture the Process of Motivation. However, following the exposés in Chapter 3.3.2., Chapter 6.4.3. and Chapter 7.4.3., exposure to the Instruments is assumed to affect Phases 5, 6, 7 and 8 in the Model of Motivation to a higher extent than Phases 1, 2 and 3, resulting in expected higher effects associated with factor score component DEDICAT, indicative of Phases 5, 6, 7 and 8, than with factor score component ACHIEV, indicative of Phases 1, 2 and 3. As such, in demonstrating an assumed cause-and-effect relation, factor score component DEDICAT is to be predominant in a formulation of hypotheses.

Following these preliminary observations, and following observations on a choice of Study 13 as research design proposed in Chapter 8.4., a number of hypotheses are to be met to provide an adequate confirmation for an assumed cause-and-effect relation between an application of the Instruments and a successful Intervention in the Process of Motivation, as indicated in the Problem Statement.

Preceding the hypotheses for testing are a number of definitions restricting the empirical verification:

- *'Measurement' is restricted to a pretest measurement and a posttest measurement following the treatment condition.*
- *The period between pretest and posttest is to be observed ranging over a period not exceeding 3 x 12 months, where a posttest measurement is not to exceed 12 months after exposure to the treatment condition.*
- *The measurement of the Process of Motivation is assumed to occur using the so-called 'elementary components' captured in factor score components DEDICAT and ACHIEV, where DEDICAT is to be predominant in a formulation of hypotheses.*
- *'Instruments' are defined as a training setting and a structured interview, with reference to Chapter 8.3.*
- *'Exposure to the Instruments' is defined as exposure of the Actor-Intervener to a training setting, as defined in Appendix LXI, Section A, and exposure of the Individual to a structured interview, as defined in Appendix LXI, Section B. As such, 'exposure to the Instruments' is considered to be the experimental*

exposure to the treatment condition. A diversification is made in four conditions[1]*:*

- *... a 'single exposure', where the Actor-Intervener participates in a training setting, and the Individual is exposed to a single structured interview, at time of posttest observation,*
- *... a 'two-fold exposure', where the Actor-Intervener participates in a training setting, and the Individual is exposed to two structured interviews, at time of posttest observation,*
- *... a 'three-fold exposure', where the Actor-Intervener participates in a training setting, and the Individual is exposed to three structured interviews, at time of posttest observation,*
- *... a 'four-fold exposure', where the Actor-Intervener participates in a training setting, and the Individual is exposed to four structured interviews or more, at time of posttest observation.*

From these restricting definitions, following hypotheses are formulated:

- *Hypothesis 1 (H1): It is hypothesized that addressing the Process of Motivation by means of exposure to the Instruments leads to a significantly higher Motivation within the Experimental Group as compared to a Control Group that has had no such exposure. A diversification for H1 is made in four additional variations:*
  - *a) Hypothesis 1A (H1A): It is hypothesized that addressing the Process of Motivation by means of a single exposure to the Instruments leads to a significantly higher Motivation within the Experimental Group as compared to Control Groups that have had no such exposure.*
  - *b) Hypothesis 1B (H1B): It is hypothesized that addressing the Process of Motivation by means of a two-fold exposure to the Instruments leads to a significantly higher Motivation within the Experimental Group as compared to Control Groups that have had no exposure.*
  - *c) Hypothesis 1C (H1C): It is hypothesized that addressing the Process of Motivation by means of a three-fold exposure to the Instruments leads to a significantly higher Motivation within the Experimental Group as compared to Control Groups that have had no exposure.*
  - *d) Hypothesis 1D (H1D): It is hypothesized that addressing the Process of Motivation by means of a four-fold, or higher, exposure to the Instruments leads to a significantly higher Motivation within the Experimental Group as compared to Control Groups that have had no exposure.*

[1] In defining 'exposure to the Instruments', a decision was made to make no distinction between the training setting aimed at the Actor-Intervener, and the structured interview aimed at the Individual. As a consequence however, the definition especially of a 'two-fold', 'three-fold' and 'four-fold' exposure could have an ambiguous connotation as in all three instances the Actor-Intervener is exposed to a single training setting, with only the Individual exposed to multiple structured interviews.

Where a 'significantly higher Motivation' is defined as:

- *Component DEDICAT generating significantly superior scores within the Experimental Group as compared to the Control Group on the posttest condition, as opposed to scores that are comparable amongst Experimental and Control Groups on the pretest condition*[1].
- *Component ACHIEV generating no significant differences in scores within both Experimental and Control Groups.*

Given the initial assumption stated Chapter 8.4., when these hypotheses are met, it is assumed that evidence will have been provided for a causal relation to exist between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing exemplary Instruments, as indicated in the Problem Statement, Chapter 2.5.

A confirmation of these hypotheses will provide secondary empirical evidence in support of the Model of Motivation, from which these Instruments are derived.

8.4.4. *Conclusion*s

The present Chapter was to define an experimental design aimed at establishing evidence for a cause-and-effect relation between application of Instruments and a successful Management of Motivation.

The empirical research is to provide causal evidence in a single Experimental Study, with a brief synopsis of two additional Studies in a following research design, with reference to the extensive design of experiment covered in Mennes (2016, in press), notably Chapter 14.:

- *Study 12: Comparative Analysis Independent Measures: a brief Synopsis of a Posttest-Only Design Using an Independent Pretest Sample, with Diversification In Control Groups.*
- *Study 13: Comparative Analysis Independent Measures: A Posttest-Only Design Using an Independent Pretest Sample, with Diversification in Treatment Groups. The Study is aimed at verification of H1, notably H1A, H1B, H1C and H1D.*
- *Study 14: Comparative Analysis Dependent Measures: a brief synopsis of an Untreated Control Group Design With Dependent Pretest and Posttest Samples.*

[1] As the Independent Group Design does not provide an adequate experimental design to compare pretest and posttest conditions over time, only the posttest condition can be used to demonstrate effects of treatment in comparison to non-treatment. In a Dependent Group Design, a within-subjects factor Time allows for observations comparing both pretest and posttest conditions, hence producing two distinct statuses to be observed in detecting a significant improvement in levels of Motivation.

8.5. Empirical Research
Experimental Studies: Comparative Analyses
8.5.1. Study 12: Comparative Analysis Independent Measures
Diversification in Control Groups

Referring to Mennes (2016*, in press*), notably Chapter 14.5.1., Study 12 was the first of a series aimed at verifying the assumption of a cause-and-effect relation between an application of Instruments and a successful addressing of the Process of Motivation. Study 12 was performed within Company XXI, with reference to Appendix LXIII. As stated Chapter 8.4., a brief summary is provided, as a first introduction to Study 13.

The Study aimed at verification only of hypothesis H1C, as a result of data-sampling. The Comparative Analyses were performed in three phases.

In the first phase, an introductory One-way independent ANOVA was performed, testing the principal Experimental and Control Groups in both pretest and posttest settings. The analysis provided a first confirmation of hypothesis H1C, where a three-fold exposure to the Instruments was assumed to have had a significant positive impact on Motivation as captured by component DEDICAT within the Experimental Group as compared to the Control Group, with Welches' $F(1, 38.15)=5.14$, $p<.05$, $\eta^2=.020$, on the posttest condition, as compared to $F(1, 144)=0.76$, $p=.38$, $\eta^2=.005$, on the pretest condition.

A second phase, consisted of a Planned-Comparison, allowing for an analysis with Diversification in a number of Control Groups. A Planned-Comparison for the Experimental Group versus the combined Control Groups, revealed no significant differences in the pretest setting, with $t(255)=1.79$, $p=.08$ (two-tailed), $\eta^2=.018$, whereas in the posttest condition a significant difference appeared for the Experimental Group after treatment, with $t(30.45)=-2.50$, $p<.05$ (two-tailed), $\eta^2=.011$. A Planned-Comparison with Diversification in separate Control Groups, revealed significant results on two of the three Control Groups in the posttest condition, $t(38.15)=2.27$, $p<.05$ (two-tailed), $\eta^2=.011$, $t(46.46)=2.23$, $p<.05$ (two-tailed), $\eta^2=.011$, and $t(43.37)=1.49$, $p=.14$ (two-tailed), $\eta^2=.011$, respectively, as opposed to non-significant results in the Planned Comparison in the pretest condition, $t(225)=-.87$, $p=.39$ (two-tailed), $\eta^2=.018$, $t(225)=-1.76$, $p=.08$ (two-tailed), $\eta^2=.018$, and $t(225)=-1.59$, $p=.11$ (two-tailed), $\eta^2=.018$ respectively. A full overview of these Planned-Comparisons for One-way independent ANOVA in both pretest and posttest situations is provided in Appendix LXIV and Appendix LXV respectively.

Finally, in a third and final phase of the Comparative Analysis, a Two-way independent factorial ANOVA was performed, evaluating the interaction of pre- and posttest variables and the effects of these interactions on the observed factor score component DEDICAT, capturing Motivation. Results were in line with previous findings, where a significant effect for the model in general was obtained, with $F(3, 406)=8.32$, $p<.001$, $\eta^2=.058$, and a significant interaction effect between Group and Time-of-Measure on Motivation, $F(1, 406)=4.10$, $p<.05$, $\eta^2=.010$.

No significant results were obtained on pre- and posttest conditions for factor score component ACHIEV, in confirmation with preliminary observations made in Chapter 8.4.3.

As a principal outcome it was concluded that Study 12 did provide a first evidence for the assumption that a causal relation exists between an application of the Instruments and a successful addressing of the Process of Motivation, thus confirming hypothesis H1C, Chapter 8.4.3.

8.5.2. Study 13: Comparative Analysis Independent Measures *Diversification in Treatment Groups*

Referring to Mennes (2016, in press), notably Chapter 14.5.2., Study 13 was the second in a series of separate Studies aimed at verifying the assumption of a cause-and-effect relation between an application of Instruments and a successful addressing of the Process of Motivation. The Study is presented to provide support for the assumption that exposure to a specific Instrumentation, would lead to improved Motivation as compared to a Control Group, thereby providing secondary evidence in support of the Model of Motivation, from which the design of the Instruments is derived.

Thus, Study 13 aims at a verification of Hypothesis H1, defined in Chapter 8.4.3., hypothesizing that addressing the Process of Motivation by means of exposure to these Instruments would lead to a significantly higher Motivation within an Experimental Group as compared to a Control Group that has had no such exposure. A Diversification in Treatment Groups is to observe the effects of multiple exposures.

The Study follows a Posttest-Only Design Using an Independent Pretest Sample.

1. Methodology

Sample; Following Study 12, a second company was approached by third parties, around the end of 2002. Although the issue of anonymity, appeared to be prominent for this second company, Company XXII, it was decided by the Management Team each employee could be approached by the researcher to provide employee-related information on an individual basis, using employee-registration numbers issued by the company. As this information was provided on a voluntary basis, it was initially anticipated the Study would provide insufficient numbers for a Comparative Analysis using Dependent Measures in a pretest posttest design. As a consequence, in Study 13 an Independent Group Design was chosen[1].

Company XXII graciously provided no restrictions on exposure to the Instruments, thus enabling a full Diversification in Treatment, with subject-exposure to treatment covering one, two, three and four exposures to the treatment condition depending on the number of structured interviews held per subject. Subjects with no exposure to the treatment condition were considered to be the Control Group in the posttest condition. Independent Pretest Samples were randomly assigned to five Groups from the population prior to treatment. Pretest and Posttest sampling occurred within the 3 x 12 months time-constraints defined in Chapter 8.4.3. As a result, in the Comparative Analysis sampling consisted of five randomly assigned, pretest Experimental and Control Groups, and four Experimental Groups, with one Control

[1] As it appeared at the end of the Study, the number of subjects on the posttest measurement providing their employee-registration number proved to be adequate to allow for a modest pretest posttest Dependent Group Design, as presented in a Synopsis of Study 14, Chapter 8.5.3.

Group in the posttest condition, with asymmetry in sampling-sizes occurring between pretest and posttest Groups.

Treatment and non-Treatment Groups were not assigned by chance: non-random assignment occurred, as management was free to decide which employees were exposed to the structured interview, and the number of sessions they held with each employee.

A short description of Company XXII is provided in Appendix LXIII. Details of the test samples are provided in Table 8.1.

Procedure; It was assumed that exposure to the Instrumentation of the training setting and application of the structured interview by an Actor-Intervener was to produce a successful Intervention in the Process of Motivation within an Individual. Within the setting of a business environment, the Actor-Intervener was represented by management, the Individual by the employee.

				Original Sample			
		Sampling date		n	N Response		
			(1)	Abs	Abs	%	
	Company XXII						
1	Pretest						(2)
	Random Group 1	12-2003	EG	36			
	Random Group 2	12-2003	EG	36			
	Random Group 3	12-2003	EG	36			
	Random Group 4	12-2003	EG	36			
	Random Group 5	12-2003	CG	36			
	Unclassified	12-2003		3			(3)
		Totals		183	224	81.7%	
2	Posttest						(4)
	Exposure to Treatment Condition:						
	1x Exposure	01-2006	EG	23			
	2x Exposure	01-2006	EG	69			
	3x Exposure	01-2006	EG	17			
	4x Exposure	01-2006	EG	22			
	No Exposure	01-2006	CG	39			
	Unclassified	01-2006		20			(5)
		Totals		190	229	83.0%	

Notes:
(1) EG = Experimental Group CG = Control Group
(2) Experimental and Control Groups in the Pretest condition were obtained through random sampling from the pretest population
(3) Rest-category of subjects eliminated from the Pretest population as a result of the random assignment in five comparable samples
(4) Experimental Groups consisted of subjects with single or multiple exposure to the Treatment condition The single Control Group consisted of subjects with no exposure to the Treatment condition
(5) Rest-category of subjects eliminated from the Posttest population as a result of providing no, or insufficient information on exposure to Treatment condition

Table 8.1.
Summarized sampling characteristics of the Comparative Analysis Independent Measures sample

Within the setting of a business environment, the experiment was conducted in a following sequential procedure:

- *Pretest:* Prior to exposure to the treatment condition, the HF-2.01 questionnaire was used containing evaluative items on Motivation, as described in Chapter 5.3. and Appendix III. The questionnaire was administered to all employees. The HF-2.01 questionnaire was used to generate factor scores associated to components DEDICAT and ACHIEV, capturing the concept of Motivation, following conclusions made in Chapter 5.5.3. Within the total group of respondents, subjects were randomly assigned to five equally sized samples, aimed to match as Independent Pretest Samples, their equivalents in the posttest condition. Within these matching pairs, four groups were randomly assigned as Experimental Groups, anticipating on the four Experimental Groups in the posttest stage of the experiment, and one Group as Control Group, as an independent match to the single posttest Control Group.
- *Treatment:* Following the pretest, the intervention stage consisted of exposure to the two-fold Instrumentation: the training setting and the structured interview. As no restrictions were set by the company on exposure, the experimental setting provided an environment where a Diversification in Treatment could be made. Exposure to treatment occurred in a following successive order:
  - *Training sessions:* Following the pretest measurement, a series of training sessions were held prior to the experiment, during which the entire management team of Company XXII was exposed to the training setting as defined in Appendix LXI, Section A. The training sessions were held directly after the pretest measurement, in successive sessions, each consisting of 8-10 members of management. In each training, two sessions were held, a 2½ day session and a 1 day follow-up[1].
  - *Structured interviews:* Following the training sessions, the intervention stage consisted of exposure to the structured interview, as defined in Appendix LXI, Section B. The decision on the frequency of exposure to the treatment condition was left to individual managers: some managers held only a single interview with their staff, others held multiple interviews, some involved their entire staff, whereas others held interviews with only a selection of their employees.
- *Posttest:* For the posttest measurement of effects, the HF-2.01 questionnaire was again administered to all employees. Posttest measurement occurred 26 months after pretest measurement. Depending on the frequency of exposure to treatment as reported by employees on the posttest measurement, a Diversification in Treatment was made in four groups: employees reporting exposure to a single structured interview were assigned to Experimental Group

[1] 14 Months after the training session, another 1-day follow-up was held, where best practice experiences were exchanged by management team members.

A, employees reporting having had two structured interviews, and thus two exposures to the treatment condition, were assigned to Experimental Group B, employees reporting three exposures, to Experimental Group C, and employees reporting at least four exposures, to Experimental Group D. As a consequence, a Diversification in Treatment was achieved including four Experimental Groups with 1x, 2x, 3x, and 4x, or more exposures to the experimental condition. As such, the empirical research in Study 13 aimed at verification of hypothesis *H1*, could be further diversified into a verification of hypothesis *H1A, H1B, H1C* and *H1D* defined in Chapter 8.4.3. In contrast, employees reporting they had had no exposure to the treatment condition were designated as Control Group E in the posttest measurement of effects.

Following this procedure, a design of experiment was obtained as visualized in Fig. 8.1. In order to maintain a synergy with the original design of experiment from which Study 13 was obtained, the Experimental and Control Group numbered references from the original design were preserved. Reference is made to Mennes (2016, *in press*), notably Chapter 14.4.2.3., Fig. 14.3., reproduced in Appendix LXII, Section B., Fig. A.

Thus, referring to Fig. 8.1., four randomly assigned Experimental Groups EG_{O3A}, EG_{O3B}, EG_{O3C} and EG_{O3D}, were obtained in the pretest condition as Independent Pretest Samples matching those in the posttest condition, according to the research defined as a Posttest-Only Design Using an Independent Pretest Sample. In the pretest condition, a fifth Group was randomly designated as Control Group CG_{O3E}, intended to act as a match to the Control Group in the posttest condition. Following exposure to the treatment condition, Diversification in Treatment was obtained by observing four Experimental Groups: EG_{O4A} with a single exposure, EG_{O4B} with a two-fold exposure, EG_{O4C} with a three-fold exposure, and EG_{O4D} with a four-fold exposure to the structured interview, as part of the treatment condition. In contrast, a single Group, reporting no exposure to the treatment condition, was designated as Control Group CG_{O4E}.

NR	O_{3A}	X_A	O_{4A}
NR	O_{3B}	X_B	O_{4B}
NR	O_{3C}	X_C	O_{4C}
NR	O_{3D}	X_D	O_{4D}
NR	O_{3E}		O_{4E}

Notation (following Shadish, Cook & Campbell, 2002):
NR – Non Random Assignment
X – Exposure to Treatment or Experimental Event
O – Process of Observation or Measurement
A vertical dashed line indicating sample independence

Fig 8.1.
A Visualized Overview of the Posttest-Only Research Design Using an Independent Pretest Sample as used in the Comparative Analysis of Study 13.

Hypotheses; The quasi-experimental design is aimed at null hypothesis significance

testing through a Posttest-Only Design Using an Independent Pretest Sample, with Diversification in Treatment Groups, as stated Chapter 8.4.

In a three-fold cause-and-effect analysis, to this aim, following hypotheses are defined, with reference to Chapter 8.4.3.:

- *Hypothesis 1, with a diversification in variations H1A, H1B, H1C and H1D as a result of the posttest data sampling enabling a Diversification in Treatment:* It is hypothesized that addressing the Process of Motivation by means of exposure to the Instruments leads to a significantly higher Motivation within Experimental Groups as compared to a Control Group that has had no such exposure. In hypothesis *H1,* four variations are defined according to exposure:

- Hypothesis 1A *(H1A)*: a higher Motivation as a result of a single exposure,
- Hypothesis 1B *(H1B)*: a higher Motivation as a result of a two-fold exposure,
- Hypothesis 1C *(H1C)*: a higher Motivation as a result of a three-fold exposure,
- Hypothesis 1D *(H1D)*: a higher Motivation as a result of a four-fold, or higher, exposure.

Given the earlier observations on component DEDICAT as principal indicator of Motivation, the various hypotheses can be restated in following forms, with special reference in the notations used for component DEDICAT, that an associated *lower* factor score is indicative of a *higher* Motivation[1]:

H1A is considered valid,
while $DEDICAT_{O3A} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4A} < DEDICAT_{O4E}$,

where H_0*: while* $DEDICAT_{O3A} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4A} >= DEDICAT_{O4E}$.

H1B is considered valid,
while $DEDICAT_{O3B} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4B} < DEDICAT_{O4E}$,

where H_0*: while* $DEDICAT_{O3B} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4B} >= DEDICAT_{O4E}$.

H1C is considered valid,
while: $DEDICAT_{O3C} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4C} < DEDICAT_{O4E}$,

where H_0*: while* $DEDICAT_{O3C} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4C} >= DEDICAT_{O4E}$.

H1D is considered valid,
while: $DEDICAT_{O3D} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4D} < DEDICAT_{O4E}$,

where H_0*: while* $DEDICAT_{O3D} = DEDICAT_{O3E}$, *then* $DEDICAT_{O4D} >= DEDICAT_{O4E}$.

[1] Hypotheses *H1A, H1B, H1C* and *H1D,* are formulated according to the respective Experimental Group associated with each specific hypothesis, without referring to other Experimental Groups.

In addition, a trend-analysis is to be used in testing the hypotheses:

while: $Trend\_DEDICAT_{O3A,\ O3B,\ O3C,\ O3D} = DEDICAT_{O3E}$, *then* $Trend\_DEDICAT_{O4A,\ O4B,\ O4C,\ O4D} < DEDICAT_{O4E}$,

where H_0: *while* $Trend\_DEDICAT_{O3A,\ O3B,\ O3C,\ O3D} = DEDICAT_{O3E}$, *then* $Trend\_DEDICAT_{O4A,\ O4B,\ O4C,\ O4D} >= DEDICAT_{O4E}$.

Measures; In the analysis following measures are defined:

- *Independent variable:* The Study includes two independent variables, defined as 'Group' and 'Time-of-Measure'. The independent variable 'Group' is exposure to the structured interview, with Diversification in Treatment in the Experimental Groups, including a single, a two-fold, a three-fold and a four-fold exposure, or more, to the treatment condition, and a Control Group having had no exposure to treatment. The independent variable 'Time-of-Measure' is the time of observation, in either pretest and posttest condition.

- *Dependent variable:* The dependent variable is Motivation, as captured following conclusions made in Chapter 5.5.3., with components DEDICAT and ACHIEV represented by their respective factor scores, with essential items defined as follows:

- Component DEDICAT, consisting of items referenced as: ce, cf, cg, ci, cs, ct, dz and eb from questionnaire HF 2.01
- Component ACHIEV, consisting of items referenced as: at, au, av, ba, bb and bc from HF 2.01

Factor scores were defined following the methodology described in Chapter 5.7.1.1., summarized in Chapter 5.7.2. A full description of these items and references was provided in Appendix III, Section B., and Table 5.3.

Analysis; Following Chapter 8.4.1., the Comparative Analyses were performed in three phases:

- *An introductory One-way independent ANOVA,* testing the principal Experimental and Control Groups in both pretest and posttest settings. In the introductory ANOVA a choice for the principal Experimental Group was made for the Group with highest number of exposures to the treatment condition. As a consequence, the introductory ANOVA aimed at a verification of hypothesis *H1D.* Following conclusions in Chapter 5.5.3., a distinction was made in the analysis between factor scores DEDICAT and ACHIEV.
- *A Planned-Comparison for One-way independent ANOVA,* allowing for an analysis with Diversification in Treatment Groups. The Planned-Comparison was performed to assess effects of treatment in three analyses:
    - *Planned-Comparison for the combined Experimental Groups versus the Control Group:* Effects were observed on all four treatment conditions combined versus the Control Group in pretest and posttest settings. The analysis was presented as a first introduction to the Planned-Comparison.

- *Planned-Comparison for separate Experimental Groups versus the Control Group:* To assess effects in frequency of exposure, a subsequent analysis was made of effects of each of the four distinct treatment conditions in pretest and posttest settings.
- *Trend-analysis:* Given the sequential order in which the Treatment Groups could be observed, a trend-analysis using polynomial contrasts was provided, restricted to a basic linear trend in the value of the dependent variable across the four Treatment categories.

In all three analyses, a distinction was made between the two factor scores representing the Process of Motivation.

- *A Two-way independent factorial ANOVA,* evaluating how pre- and posttest variables interact and effects of these interactions on the observed dependent variables, after exposure to treatment.

With the experimental design aiming at null hypothesis significance testing, it was assumed that a cause-and-effect relation would be valid, when in the respective analyses of variance a significant difference in measures was found at a standard $p<.05$ level, following criteria set in Chapter 8.4.1.

Again, all assessments were made using standard SPSS procedures (Norusis, 1990).

2. Results

With reference to Table 8.1., the data-sets for the experiment were obtained with a pretest total sample size of n=183, and a posttest sample size of n=190, both within criteria of response percentages formulated in Chapter 8.4.2.

Prior to the first phase of the Comparative Analyses of the One-way independent ANOVA, a number of preliminary analyses were made. Following the exposé in Chapter 8.4.1.1., a first assumption underlying the ANOVA procedure, where dependent variables were expected to be measured at least at an interval scale with independent observations in the experimental setting, was considered to be valid. No deviation from normality was observed in the distribution of data for factor score component DEDICAT, following a Kolmogorov-Smirnov Test, where no significant values were obtained, with pretest scores $D(36)=0.07,\ p=.20$ for Experimental and $D(36)=0.10,\ p=.20$ for Control Groups, and posttest scores $D(22)=0.12,\ p=.20$ for the Experimental Group. However, the assumption of normality appeared to be violated for the posttest Control Group with $D(39)=0.16,\ p<.01$. Although these K-S scores are still within the range of criteria set in Chapter 8.4.1.1. in determining acceptance of the assumption of normality, with ¾ of observed Groups meeting required criteria of normality, the data are to be observed with caution, where a discrepancy in sample sizes was also observed. The assumption of homogeneity of variance was met for all Groups for factor score component DEDICAT, following Levene's Test as indicated in Chapter 8.4.1.1., with $F(1,70)=1.17,\ p=.28$ for the pretest Experimental and Control Group

comparison, and Levene's $F(1,59)=0.42,\ p=.52$ for the posttest comparison. For factor score component ACHIEV no violation of basic assumptions was observed, with Kolmogorov-Smirnov values in pretest scores of $D(36)=0.12,\ p=.20$ for the principal Experimental and $D(36)=0.09,\ p=.20$ for Control Groups, and with respective posttest scores $D(22)=0.15,\ p=.19$ and $D(39)=0.10,\ p=.20$, confirming the assumption of normality. Finally, no significant values were obtained for Levene's Test with $F(1,70)=0.02,\ p=.88$ for the pretest, and $F(1,59)=0.11,\ p=.74.$ for the posttest comparison, thus accepting the null hypothesis that the difference between variances was zero and therefore that the assumption was tenable that variances could be considered as roughly equal.

The cause-and-effect analysis was initiated with a One-way ANOVA comparative test of the principal pretest and posttest Experimental and Control Groups. Outcomes of the introductory analysis are provided in Table 8.2.

The introductory ANOVA tested the hypothesis that the Means of the principal Experimental Group differs from the Control Group in pre- and posttest settings, with a null hypothesis assuming that all group Means are the same. Within the pretest condition for factor score component DEDICAT both Means appeared to be comparable with $F(1,\ 70)=0.07,\ p=.79,\ \eta^2=.001$. In the posttest condition, after exposure to the Instruments, i.e. after a four-fold exposure by employees to the structured interview, following training sessions with management performing these interviews, a significant effect appeared of the treatment condition on levels of Motivation as captured by factor score component DEDICAT, with $F(1,\ 59)=5.97,\ p<.05,\ \eta^2=.092$. The *F*-ratio represents the measurement of systematic to unsystematic variation, or rather, the average amount of variation as explained by the model, MS_M, versus the amount of variation explained by the various extraneous variables, MS_R. With an *F*-ratio of 5.97 for the posttest condition, the systematic variation as explained by the model, far exceeded the unsystematic variation explained by extraneous variables. As a result it was concluded that the experimental treatment had an effect above the effect of individual differences. And given the *F*-value also exceeded a critical value one would expect to obtain by chance alone in an *F*-distribution with comparable degrees of freedom, the observed value was considered to be significant in indicating a treatment effect.

No such effects were observed for factor scores associated with component ACHIEV on the posttest condition with $F(1,\ 59)=2.20,\ p=.14,\ \eta^2=.036,$ with a previous observation on the pretest condition of $F(1,\ 70)=3.28,\ p=.07,\ \eta^2=.045.$

Given that in first observations in the Comparative Analysis a choice of the principal Treatment Group in pretest and posttest situations was made for the Experimental Group with highest number of exposures to the treatment condition, the introductory ANOVA aimed at verification of hypothesis H1D, defined Chapter 8.4.3. Findings provided a confirmation for the hypothesis, where frequent exposure to the Instruments was assumed to have a significant positive impact on Motivation as captured by component DEDICAT within the Experimental Group as compared to the Control Group that had no exposure to treatment.

	Pretest			Posttest			
	EG_{O3D}	CG_{O3E}	ANOVA	EG_{O4D}	CG_{O4E}	ANOVA	(5)(6)
	M (SD) N	M (SD) N	F η^2	M (SD)	M (SD)	F η^2	
(1)	(2)	(2)	(3)	(2)	(2)	(3)(4)	
1. DEDICAT	-0.20 (0.97) 36	-0.26 (0.79) 36	0.07 .001	-0.49 (1.04) 22	.18 (1.03) 39	5.97 * .092	
2. ACHIEV	-0.49 (1.05) 36	-0.04 (1.06) 36	3.28 .045	-0.48 (0.87) 22	-0.14 (0.86) 39	2.20 .036	

Notes:
(1) Factorscores
(2) M = Mean SD = Standard deviation N = Sample size
(3) F = F-Ratio η^2 = Eta squared
*(4) * Statistic significant at the 0.05 level*
*** Statistic significant at the 0.01 level*
*** Statistic significant at the 0.001 level*
(5) EG = Experimental Group CG = Control Group
(6) In the subscript, reference is made to the Experimental and Control Group indications in Fig. 8.1.

Table 8.2.
One-way independent ANOVA of principal Experimental and Control Groups on levels of Motivation, as captured by factor scores of components DEDICAT and ACHIEV in Pre- and Posttest Settings;
A Summary of Main Results

Following these first findings from the principal Experimental Group, in a second analysis, a Planned-Comparison was performed to assess effects of Diversification in Treatment Groups. Groups with a single, a two-fold, and a three-fold exposure to the treatment condition were included in the research design. The Planned-Comparison analysis included an analysis of the combined Experimental Groups, an analysis of these Groups separately and a trend-analysis.

Preliminary testing of basic assumptions revealed no violations of assumed normality and equality in variances for the pretest condition. Following a Kolmogorov-Smirnov Test, no significant values were obtained for the three additional Experimental Groups EG_{O3A}, EG_{O3B} and EG_{O3C} in factor scores of component DEDICAT, with respective pretest scores $D(36)=0.08$, $p=.20$, $D(36)=0.13$, $p=.10$, and $D(36)=0.14$, $p=.07$, and Levene's $F(4,175)=1.93$, $p=.11$. Conditions in the posttest phase diverged, with one additional Experimental Group, EG_{O4B}, deviating from normality, with respective K-S scores $D(23)=0.17$, $p=.07$, $D(69)=0.12$, $p<.05$ and $D(17)=0.13$, $p=.20$. Although, in addition to the posttest Control Group CG_{O4E} mentioned earlier, with K-S score $D(39)=0.16$, $p<.01$, only two Groups within the experimental setting revealed a violation of assumed normality, thus meeting the criteria set in Chapter 8.4.1.1. for determining

acceptance of the assumption of normality, and more than ¾ of observed Groups appear to meet these criteria, the data are to be observed with caution, especially in view of a discrepancy in sample sizes. No violations, however, were observed for the assumption of homogeneity of variance for the Experimental Groups versus the Control Group, with Levene's $F(4,165)=1.13, p=.34$ for the posttest condition. No significant values were obtained in pretest data for factor scores of component ACHIEV for the additional Experimental Groups, with respective pretest Kolmogorov-Smirnov scores $D(36)=0.09, p=.20, D(36)=0.09, p=.20,$ and $D(36)=0.11, p=.20$. Again, however, an Experimental Group EG_{O4A} violated the assumption of normality, although meeting criteria set in Chapter 8.4.1.1., with respective posttest K-S scores $D(23)=0.20, p<.05, D(69)=0.07, p=.20$ and $D(17)=0.14, p=.20$. The assumption of equality in variance was met with Levene's $F(4,175)=0.42, p=.79$ for pretest, and $F(4,165)=1.53, p=.20$ for posttest scores.

The Planned-Comparison was initiated with an analysis of all Experimental Groups combined, where Diversification in a single- a two-fold, a three-fold or a four-fold, or higher, exposure to the treatment condition was observed versus the Control Group. Table 8.3. provides a summarized overview of results for the pretest phase, with Table 8.4. summarizing results of the posttest phase of the experiment. Reference is made to more detailed overviews in Appendix LXVI and Appendix LXVII, respectively.

The Planned-Comparison was performed to test the hypothesis that the Means of the four Experimental Groups, being exposed to the treatment condition, would differ in the posttest condition from the Means of the Control Group, where no differences would appear in the pretest condition, prior to treatment. Within limitations mentioned, the data appear to support the assumption. In the pretest condition no significant differences appeared between the four combined Experimental Groups and the Control Group. On the posttest condition, however, following treatment, a significant difference was observed in Motivation as captured by factor scores of component DEDICAT.

In breaking down the variance accounted for by the model into component parts, the Planned-Comparison was performed to compare the combined Experimental Groups to the Control Group in pretest and posttest settings. No significant differences were observed in the pretest setting, with $t(175)=-.16, p=.87$ *(two-tailed),* $\eta^2=.003,$ as compared to the posttest condition for the combined Experimental Groups after treatment, where a significant difference appeared, $t(165)=2.14, p<.05$ *(two-tailed),* $\eta^2=.037$. As a consequence H_0 was rejected, in favor of H_A, supporting the initial hypothesis *H1,* where it was assumed that addressing the Process of Motivation by means of exposure to the Instruments would lead to a significantly higher Motivation within the combined Experimental Groups as compared to the Control Group that had no exposure.

		Pretest Contrast Results Planned-Comparison				
(1)				B t η^2 (2)(3)	95% confid. int. LB UB (4)	
DEDICAT	*Contrast:*	$EG_{O3A, O3B, O3C, O3D}$	CG_{O3E}	-.12 -.16 .003		*(5)(6)(7)*
ACHIEV	*Contrast:*	$EG_{O3A, O3B, O3C, O3D}$	CG_{O3E}	1.04 1.36 .026		*(5)(6)(7)*

Notes:
(1) Factorscores
(2) B = Contrast estimate t = t-test statistic of the contrast η^2 = Eta squared of the overall contrast procedure
*(3) * Statistic significant at the 0.05 level (two-tailed)*
*** Statistic significant at the 0.01 level (two-tailed)*
**** Statistic significant at the 0.001 level (two-tailed)*
(4) Range of the 95% confidence interval of the contrast estimate
LB = Lower bound of the interval UB = Upper bound of the interval
(5) EG = Experimental Group CG = Control Group
(6) In the subscript, reference is made to the Experimental and Control Group indications in Fig. 8.1.
(7) No confidence interval estimates are provided in the standard SPSS output routine
For a full overview of contrast results, reference is made to Appendix LXVI

Table 8.3.
Planned-Comparison for One-way independent ANOVA of Experimental and Control Groups on factor scores of components DEDICAT and ACHIEV in Pretest Setting; Contrast Results for the combined Experimental Groups versus the Control Group

In parallel to the findings from Study 12, the analysis revealed no significant differences between groups in factor scores associated to component ACHIEV, with *t(175)=1.36, p=.18 (two-tailed),* η^2*=.026,* for the Planned-Comparison Results on the pretest condition, and *t(165)=-.84, p=.40 (two-tailed),* η^2*=.085,* for Results in the posttest condition.

A further Diversification in Treatment was obtained in a series of additional contrasts capturing the effects of each separate Experimental Group, thus providing insights into the effects of a single, a two-fold, a three-fold and a four-fold exposure to the Instruments enabling a verification of hypotheses *H1A, H1B, H1C* and *H1D*. These results are provided in Table 8.5. and Table 8.6. for pretest and posttest conditions. A full overview of these series of Planned-Comparisons for One-way independent ANOVA's in both pretest and posttest situations is provided in Appendix LXVIII and Appendix LXIX respectively, with associated Contrast Coefficients. Table 8.5 and Table 8.6. are the summarized overviews of these Contrast Tests.

		Posttest Contrast Results Planned-Comparison				
				B t η^2	95% confid. int. LB UB	
(1)				(2)(3)	(4)	
DEDICAT	Contrast:	$EG_{O4A, O4B, O4C, O4D}$	CG_{O4E}	1.74 2.14 * .037		(5)(6)(7)
ACHIEV	Contrast:	$EG_{O4A, O4B, O4C, O4D}$	CG_{O4E}	-.61 -.84 .085		(5)(6)(7)

Notes:
(1) Factorscores
(2) B = Contrast estimate t = t-test statistic of the contrast η^2 = Eta squared of the overall contrast procedure
(3) * Statistic significant at the 0.05 level (two-tailed)
** Statistic significant at the 0.01 level (two-tailed)
*** Statistic significant at the 0.001 level (two-tailed)
(4) Range of the 95% confidence interval of the contrast estimate
LB = Lower bound of the interval UB = Upper bound of the interval
(5) EG = Experimental Group CG = Control Group
(6) In the subscript, reference is made to the Experimental and Control Group indications in Fig. 8.1.
(7) No confidence interval estimates are provided in the standard SPSS output routine
For a full overview of contrast results, reference is made to Appendix LXVII

Table 8.4.
Planned-Comparison for One-way independent ANOVA of Experimental and Control Groups on factor scores of components DEDICAT and ACHIEV in Posttest Setting; Contrast Results for the combined Experimental Groups versus the Control Group

The Planned-Comparison between the different Experimental Groups and the Control Group at the pretest condition, revealed non-significant results. Respective outcomes for the different comparisons for Experimental Groups EG_{O3A}, EG_{O3B}, EG_{O3C}, and EG_{O3D} versus the Control Group CG_{O3E} were comparable, with *t(175)=.23, p=.82 (two-tailed),* η^2*=.003, t(175)=-.31, p=.75 (two-tailed),* η^2*=.003, t(175)=.34, p=.73 (two-tailed),* η^2*=.003,* and *t(175)=.25, p=.80 (two-tailed),* η^2*=.003* respectively[1]. Confidence intervals associated with these non-significant results all contained zero. On the posttest condition, in line with previous findings, exposure to treatment revealed a gradual effect on Motivation. Referring to Table 8.6, Planned-Comparisons between the various Experimental Groups and the Control Group in the posttest setting obtained following results, with *t(165)=-1.60, p=.11 (two-tailed),* η^2*=.037,* for the first Experimental Group EG_{O4A}, with *t(165)=-1.68, p=.10 (two-tailed),* η^2*=.037,* for the second Experimental Group EG_{O4B}, with *t(165)=-.82, p=.42 (two-tailed),* η^2*=.037,* for the third Experimental Group EG_{O4C},

[1] Eta squared was derived from the combined sum of squares SS_M of the overall contrast, relative to the total sum of squares SS_T, producing overestimated effect sizes for the various contrasts.

and with *t(165)=-2.35, p<.05 (two-tailed),* η^2*=.037* for the fourth Experimental Group EG_{O4D}, in line with outcomes previously registered for the One-way independent ANOVA where both Groups EG_{O4D} and CG_{O4E} were observed earlier. Given that the outcome of the comparison between both Groups appeared to be significant, the confidence interval did not contain zero. In addition, however, it is noted that the lower limit of the interval (*-1.24*) appeared to be about 10 times larger than the upper limit (*-.11*), and the confidence interval therefore contained values that were rather distinct from each other.

A Planned-Comparison for factor scores associated with component ACHIEV, revealed no significant outcomes on the pretest condition, with respective scores for Experimental Groups EG_{O3A}, EG_{O3B}, EG_{O3C}, and EG_{O3D} versus Control Group CG_{O3E}, as obtained in the analysis: *t(175)=-1.40, p=.16 (two-tailed),* η^2*=.026, t(175)=-.39, p=.70 (two-tailed),* η^2*=.026, t(175)=-.65, p=.52 (two-tailed),* η^2*=.026,* and *t(175)=-1.86, p=.07 (two-tailed),* η^2*=.026* respectively, with confidence intervals all containing zero[1]. Referring to Table 8.6, a remarkable effect was observed for Experimental Group EG_{O4A} in contrast to the Control Group CG_{O4E}, indicating a significant effect of treatment after a single exposure to the Instruments, with *t(165)=2.77, p<.01 (two-tailed),* η^2*=.085.* The effect could not be observed in subsequent Groups following exposure to a two-fold, a three-fold and a four-fold treatment in respective Experimental Groups EG_{O4B}, EG_{O4C} and EG_{O4D} versus Control Group CG_{O4E}, with *t(165)=-.08, p=.94 (two-tailed),* η^2*=.085, t(165)=.95, p=.34 (two-tailed),* η^2*=.085,* and *t(165)=-1.33, p=.19 (two-tailed),* η^2*=.085.*

The Planned-Comparison was concluded with a polynomial contrast to assess if in results obtained, a trend could be observed where increased exposure would lead to increased effects on the Process of Motivation. The contrast tested for trends in the data in its most basic form i.e. for a linear trend with a proportionate change in the value of the dependent variable across the four Experimental Groups. A significant linear trend could be observed, F_{LIN}*(1,165)=4.19, p<.05,* η^2*=.037*, indicating that as the treatment condition and exposure to the Instruments increased, Motivation, as captured by factor score component DEDICAT, increased proportionally[2]. These findings were obtained in the posttest condition; in the pretest condition no trends were observed, F_{LIN} *(1,175)=0.07, p=.79,* η^2*=.003*.

[1] Eta squared was derived from the combined sum of squares SS_M of the overall contrast, relative to the total sum of squares SS_T, producing overestimated effect sizes for the various contrasts.

[2] In the unbalanced design with unequal sample sizes in the posttest condition, the analysis was computed as a weighted linear trend.

			Pretest Contrast Results Planned-Comparison						
			M (SD) N		*M (SD) N*	*B t η^2*	*95% confid. int. LB*	*UB*	
(1)			*(2)*		*(2)*	*(3)(4)*	*(5)*		
DEDICAT	*Contrast:*	EG_{O3A}	-0.20 (0.97) 36	CG_{O3E}	-0.26 (0.79) 36	.05 .23 .003	-.40	.50	*(6)(7)*
	Contrast:	EG_{O3B}	-0.33 (0.90) 36	CG_{O3E}	-0.26 (0.79) 36	-.07 -.31 .003	-.52	.38	*(6)(7)*
	Contrast:	EG_{O3C}	-0.18 (1.15) 36	CG_{O3E}	-0.26 (0.79) 36	.08 .34 .003	-.37	.53	*(6)(7)*
	Contrast:	EG_{O3D}	-0.20 (0.97) 36	CG_{O3E}	-0.26 (0.79) 36	.06 .25 .003	-.39	.50	*(6)(7)*
ACHIEV	*Contrast:*	EG_{O3A}	-0.38 (0.93) 36	CG_{O3E}	-0.04 (1.06) 36	-.34 -1.40 .026	-.82	.14	*(6)(7)*
	Contrast:	EG_{O3B}	-0.13 (0.99) 36	CG_{O3E}	-0.04 (1.06) 36	-.09 -.39 .026	-.57	.38	*(6)(7)*
	Contrast:	EG_{O3C}	-0.20 (1.10) 36	CG_{O3E}	-0.04 (1.06) 36	-.16 -.65 .026	-.64	.32	*(6)(7)*
	Contrast:	EG_{O3D}	-0.49 (1.05) 36	CG_{O3E}	-0.04 (1.06) 36	-.45 -1.86 .026	-.93	.03	*(6)(7)*

Notes:
(1) Factorscores
(2) M = Mean SD = Standard deviation N = Sample size
(3) B = Contrast estimate t = t-test statistic of the contrast η^2 = Eta squared of the overall contrast procedure
(4) $*$ Statistic significant at the 0.05 level (two-tailed)
$**$ Statistic significant at the 0.01 level (two-tailed)
$***$ Statistic significant at the 0.001 level (two-tailed)
(5) Range of the 95% confidence interval of the contrast estimate
LB = Lower bound of the interval UB = Upper bound of the interval
(6) EG = Experimental Group CG = Control Group
(7) In the subscript, reference is made to the Experimental and Control Group indications in Fig. 8.1.
For a full overview of contrast results, reference is made to Appendix LXVIII

Table 8.5.
Planned-Comparison for One-way independent ANOVA of Experimental and Control Groups on factor scores of components DEDICAT and ACHIEV in Pretest Setting; A Summary of Main Contrast Results

			Posttest Contrast Results Planned-Comparison						
			M (SD) N		M (SD) N	B t η^2	95% confid. int. LB	UB	
(1)			(2)		(2)	(3)(4)	(5)		
DEDICAT	*Contrast:*	EG_{O4A}	-0.27 (1.06) 23	CG_{O4E}	0.18 (1.03) 39	-.45 -1.60 .037	-1.01	.11	*(6)(7)*
	Contrast:	EG_{O4B}	-0.18 (1.13) 69	CG_{O4E}	0.18 (1.03) 39	-.36 -1.68 .037	-.79	.06	*(6)(7)*
	Contrast:	EG_{O4C}	-0.07 (0.98) 17	CG_{O4E}	0.18 (1.03) 39	-.26 -.82 .037	-.87	.36	*(6)(7)*
	Contrast:	EG_{O4D}	-0.49 (1.04) 22	CG_{O4E}	0.18 (1.03) 39	-.68 -2.35 * .037	-1.24	-.11	*(6)(7)*
ACHIEV	*Contrast:*	EG_{O4A}	0.57 (0.80) 23	CG_{O4E}	-0.14 (0.86) 39	.70 2.77 ** .085	.20	1.20	*(6)(7)*
	Contrast:	EG_{O4B}	-0.15 (1.06) 69	CG_{O4E}	-0.14 (0.86) 39	-.02 -.08 .085	-.40	.37	*(6)(7)*
	Contrast:	EG_{O4C}	0.13 (1.10) 17	CG_{O4E}	-0.14 (0.86) 39	.27 .95 .085	-.29	.82	*(6)(7)*
	Contrast:	EG_{O4D}	-0.48 (0.87) 22	CG_{O4E}	-0.14 (0.86) 39	-.34 -1.33 .085	-.85	.17	*(6)(7)*

Notes:
(1) Factorscores
(2) M = Mean SD = Standard deviation N = Sample size
(3) B = Contrast estimate t = t-test statistic of the contrast η^2 = Eta squared of the overall contrast procedure
*(4) * Statistic significant at the 0.05 level (two-tailed)*
*** Statistic significant at the 0.01 level (two-tailed)*
*** Statistic significant at the 0.001 level (two-tailed)*
(5) Range of the 95% confidence interval of the contrast estimate
LB = Lower bound of the interval UB = Upper bound of the interval
(6) EG = Experimental Group CG = Control Group
(7) In the subscript, reference is made to the Experimental and Control Group indications in Fig. 8.1.
For a full overview of contrast results, reference is made to Appendix LXIX

Table 8.6.
Planned-Comparison for One-way independent ANOVA of Experimental and Control Groups on factor scores of components DEDICAT and ACHIEV in Posttest Setting; A Summary of Main Contrast Results

No linear trends were obtained in analyses of factor score component ACHIEV, in both pretest, F_{LIN} *(1,175)=1.77, p=.19,* η^2*=.026*, and posttest settings, F_{LIN} *(1,165)=2.21, p=.14,* η^2*=.085*[1].

A Planned-Comparison for One-way independent ANOVA was performed, allowing for an analysis with Diversification in Treatment Groups. The Planned-Comparison was aimed at assessing effects of treatment in three separate analyses. In a first analysis, the Planned-Comparison was performed to assess the effects of all Experimental Groups combined in relation to a Control Group with no exposure to treatment. First results revealed a significant difference in the posttest condition, after treatment, as compared to the pretest condition. In a second analysis, these findings could be further diversified, isolating the effects of each separate Experimental Group, thus providing insights into the effects of a single, a two-fold, a three-fold and a four-fold, or higher, exposure to the Instruments. In line with previous findings, exposure to treatment revealed a gradual effect on Motivation, with a significant effect after a four-fold exposure to the treatment condition, thus providing support for hypothesis H1D, as defined Chapter 8.4.3. In a final analysis, these findings were confirmed in a Planned-Comparison where a significant linear trend could be observed, indicating that as the treatment condition and exposure to the Instruments increased, Motivation increased proportionally.

In summary, then, it appears, a confirmation could be found for hypothesis H1D, where a four-fold exposure to a structured interview, following training by the Actor-Intervener, was assumed to have a significant positive impact on Motivation as captured by component DEDICAT in analyses of distinct Experimental Groups as compared to a Control Group that had no exposure to treatment, where effects were assumed to progress following a linear trend.

In a third and final analysis, a Two-way independent factorial ANOVA was to evaluate how pre- and posttest variables interact and what effects these interactions have on the observed dependent variables. A number of factorial designs were chosen in order to assess the validity of previous findings indicating effects in treatment emerging after exposure to treatment in general, after exposure to a three-fold treatment condition in parallel to Study 12, and after exposure to four or more consecutive treatment conditions, all within restricted periods of time. In each design, the Experimental and Control Groups were observed on a factor Group (Experimental Group and Control Group) over a factor Time-of-Measure (pretest condition and posttest condition). The analysis was to be performed of the model in general, of its main effects, and of the interaction between both independent variables, with special emphasis on findings for the model in general and for the interaction.

[1] *Ibid*.

In observing all Groups involved, i.e. the combined Experimental Groups versus the Control Group in both pretest and posttest settings, a non-significant effect for the model in general was obtained, with *F(3, 346)=1.95, p=.12,* η^2*=.017,* indicating that exposure to treatment per se, is not a sufficient condition for an increased Motivation to occur, as captured by factor score component DEDICAT. In observing the effects of more frequent exposures, the factorial ANOVA was restricted to the Experimental Groups with at least a three-fold exposure to the treatment condition, in parallel to Study 12, i.e. EG_{O3C} and EG_{O3D} in pretest setting, EG_{O4C} and EG_{O4D} in posttest setting, versus CG_{O3E} and CG_{O4E}, respectively. In contrast with findings from Study 12, non-significant results were obtained, with *F(3, 182)=1.94, p=.13,* η^2*=.031*. Significant results emerged in the factorial ANOVA of Experimental Groups with a four-fold exposure, i.e. EG_{O3D} in pretest setting and EG_{O4D} in posttest setting, versus CG_{O3E} and CG_{O4E}, respectively. In parallel to previous findings in the introductory One-way independent ANOVA, a significant effect for the model in general was obtained, with *F(3, 129)=2.69, p<.05,* η^2*=.059.* Variance explained by either a factor Group, or a factor Time-of-Measure revealed no noticeable differences, with a non-significant main effect of Group on Motivation as captured by component DEDICAT, *F(1, 129)=3.30, p=.07,* η^2*=.025,* and a non-significant main effect of Time-of-Measure on Motivation, *F(1, 129)=0.18, p=.67,* η^2*=.001*. More relevant, however, to the analysis of pretest and posttest related effects between Treatment Group and non-Treatment Group, a significant interaction effect was observed between Group and Time-of-Measure on Motivation, *F(1, 129)=4.62, p<.05,* η^2*=.035.*

To provide additional insights into these and previous results, a visualized overview is presented in Fig. 8.2., of Mean factor scores of component DEDICAT on pre- and posttest settings, for both the Experimental and Control Groups. The overview reveals both an important decline in Motivation, as captured by factor score DEDICAT, between pretest and posttest Time-of-Measure, whereas these levels appear to have significantly increased in the Experimental Group following a four-fold exposure to the Instrumentation and measured between pre- and posttest condition. Intermediate effects emerge for the Experimental Groups with a single, a two-fold and a three-fold exposure to treatment in the posttest condition, where mean-values appear to have remained at equivalent levels of the posttest condition. The extensive increase in Motivation as captured by factor score DEDICAT, the intermediate position of remaining Treatment Groups and the decline in Motivation for the non-Treatment Group in posttest versus pretest settings appears to be accountable for these results, that are thus in agreement with our previous findings.

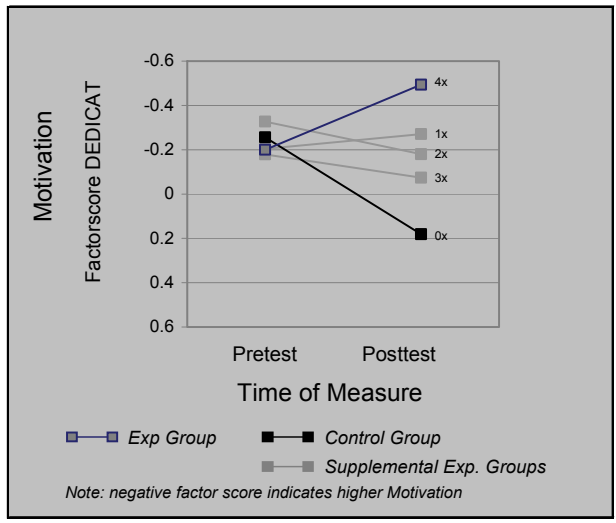


Fig 8.2.
A Visualized Overview of the Effects of Treatment on Motivation as Captured in Factor Score DEDICAT for Experimental and Control Groups in Pretest and Posttest Settings.

No significant results were obtained for factor score ACHIEV on pretest and posttest conditions, nor for the model in general, with $F(3, 346)=1.68$, $p=.17$, $\eta^2=.014$, nor for analysis of the Experimental Groups with at least a three-fold exposure, $F(3, 182)=0.82$, $p=.49$, $\eta^2=.013$, nor for the Experimental Groups with a four-fold exposure, $F(3, 129)=1.87$, $p=.14$, $\eta^2=.042$[1].

A visualized overview summarizing effects for factor score ACHIEV on pretest and posttest settings is provided in Fig. 8.3. The overview reveals a moderately scattered series of factor scores capturing component ACHIEV at the pretest condition, progressing into a heavily distributed series at the posttest condition. Within these figures no apparent and meaningful arrangement or trend can be observed, where Control and principal Experimental Groups, together with the

[1] However, a significant main effect emerged for factor Group, $F(1, 129)=5.24$, $p<.05$, $\eta^2=.039$. No significant effects appeared for factor Time-of-Measure, $F(1, 129)=0.06$, $p=.81$, $\eta^2=.000$, nor for the interaction between both variables, $F(1, 129)=0.10$, $p=.75$, $\eta^2=.001$.

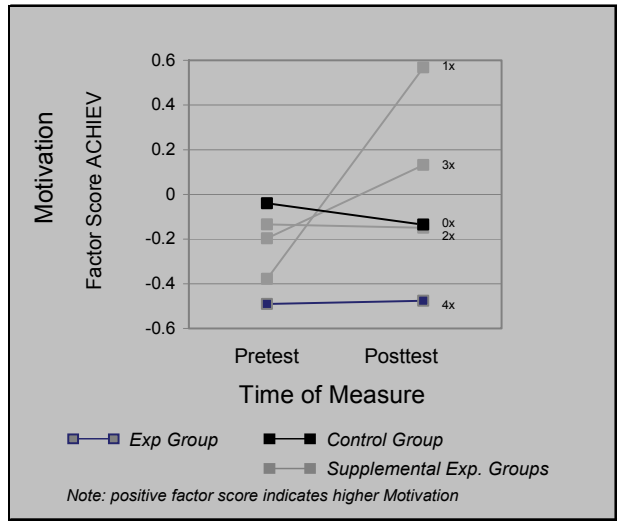


Fig 8.3.
A Visualized Overview of the Effects of Treatment on Motivation as Captured in Factor Score ACHIEV for Experimental and Control Groups in Pretest and Posttest Settings.

Experimental Group with a two-fold experimental exposure, reveal comparable values on pretest and posttest settings. In addition, however, in the supplemental Experimental Groups, the Groups with a single and a three-fold experimental exposure appear to have increased in the posttest condition, with the former Group reaching even a significant level as compared to the pretest condition.

Summarizing and evaluating the results from these three analyses, it appears the Study provides further evidence for the assumption defined in Chapter 8.4., that a causal relation exists between an application of the Instruments and a successful addressing of the Process of Motivation as stated in hypothesis H1D, defined in Chapter 8.4.3.

Given the principal hypothesis H1D was considered valid when: $DEDICAT_{O4D} < DEDICAT_{O4E}$ *, while:* $DEDICAT_{O3D} = DEDICAT_{O3E}$ *, the data appear to confirm these assumptions*[1]*, where a shift in levels of Motivation seems to have occurred between the pretest and posttest settings, with a sharp decline in Motivation in the Control Group as compared to the Experimental Group where initial levels of Motivation increased. Given these results are likely to reflect an effect of the*

[1] A *lower* factor score for DEDICAT was considered to be indicative of a *higher* Motivation.

experimental treatment and are unlikely to have arisen by chance, H_0 is to be rejected where it was assumed $DEDICAT_{O4D} >= DEDICAT_{O4E}$, while $DEDICAT_{O3D} = DEDICAT_{O3E}$.

Furthermore, the data also appear to confirm the occurrence of a trend, with $Trend\_DEDICAT_{O4A, O4B, O4C, O4D} < DEDICAT_{O4E}$, while: $Trend\_DEDICAT_{O3A, O3B, O3C, O3D} = DEDICAT_{O3E}$.

3. Discussion

In Experimental Study 13 aimed at null hypothesis significance testing, the Comparative Analyses were performed in three phases.

The first phase consisted of an introductory One-way independent ANOVA, testing the principal Experimental and Control Groups in both pretest and posttest settings, where a significant effect was observed on levels of Motivation, $F(1, 59)=5.97, p<.05, \eta^2=.092,$ on the posttest condition, as compared to the pretest condition, $F(1, 70)=0.07, p=.79, \eta^2=.001$.

In a second phase, a Planned-Comparison was performed to assess effects of Diversification in Treatment Groups. Effects were obtained after a four-fold exposure to the treatment condition, with $t(165)=-2.35, p<.05$ (two-tailed), $\eta^2=.037$ registered on the posttest condition, as compared to $t(175)=.25, p=.80$ (two-tailed), $\eta^2=.003$ on the pretest condition.

In a third and final analysis, a Two-way independent factorial ANOVA was performed to evaluate the effects of pre- and posttest variables on the observed dependent variables, especially on factor score component DEDICAT, and to evaluate how these variables interact. A significant effect for the model in general was obtained in the factorial ANOVA of Experimental Groups with at least a four-fold exposure, with $F(3, 129)=2.69, p<.05, \eta^2=.059,$ with a significant interaction effect between Group and Time-of-Measure on Motivation as captured by component DEDICAT, $F(1, 129)=4.62, p<.05, \eta^2=.035.$

These findings suggest that a significant difference in Motivation occurred within the Experimental Group after exposure to at least four sessions of a structured interview within a limited time frame, following training by the Actor-Intervener, as compared to Control Groups that had no exposure. Effects of treatment were positively related to Motivation as captured by component factor score DEDICAT, whereas effects on component factor score ACHIEV appeared to be non-related. As a principal outcome, then, it was concluded that Study 13 did provide evidence for the assumption defined in Chapter 8.4., that a causal relation exists between an application of Instruments and a successful addressing of the Process of Motivation as stated in hypothesis *H1D*, defined in Chapter 8.4.3.

Despite these findings, however, a number of important restricting observations are to be made, concerning internal, external, construct and statistical conclusion validity, as the four main criteria used in defining a choice in experimental design in the original research, with reference to Appendix LXII, Section B.

First, a number of potential threats to internal validity are to be considered. Bias occurring as a result of sampling within a single company, where company-related characteristics could have unintentionally affected treatment results, needs careful consideration. Moreover, interference from company regulations and policies with treatment outcomes, and effects resulting from various events occurring during the pretest posttest period could have been threats to internal validity[1].

External validity concerns inferences about the extent to which a causal relationship holds over variations of the experiment and could be generalized over different persons, settings, different treatments and measurement variables. The more diverse the various comparison Groups, the higher the probability of an adequate extrapolation of research findings and a generalization of the observed causal relationships to other settings. The chosen approach in Study 13, avoiding a company-departmental assignment of Experimental or Control Groups, has contributed to avoid possible threats to external validity. Nonetheless, within the company setting, variations in work content and work environment could have affected results, although these variations are expected to have been compensated to a considerable extent by avoiding a departmental allocation of Experimental and Control Groups[2].

Threats to construct validity appear to be prominent within the chosen experimental design. The operationalization of Instruments into a specific training setting and a structured interview has implications that affect construct validity. Although the chosen design in Study 13 allows for a pluriform deployment of the structured interview by several Actor-Interveners, the training setting performed by a single trainer, might have affected the outcome results. On the same grounds, observation by means of the HF-2.01 questionnaire proposed in Chapter 5.3., enabled an adequate measurement of effects as concluded Chapter 5.5.3., but the uniform approach could have had comparable, unintended effects on the outcomes of the experiment. In the non-random procedural approach, subjects responding to being accepted to or excluded from treatment, or effects resulting from participant's expectations and perceptions of the experimental treatment, or effects resulting from introducing a new Instrumentation in addressing Motivation, are issues that remain to be addressed in subsequent research within a different setting. Although a

[1] In observing potential threats to internal validity, these various issues are identified, respectively, as: Interactive Effects of Threats to Internal Validity and History, with reference to Shadish, Cook & Campbell (2002).

[2] Referring to observations of various threats to external validity, the threat is identified as: Context-Dependent Mediation, with reference to Shadish, Cook & Campbell (2002).

Diversification in Treatment allowed for an accurate assessment of these effects, with observations differentiated according to frequencies of exposure to the treatment condition, construct validity issues call for additional measures to supplement the present research[1].

A number of issues concerning statistical conclusion validity remain. Limitations as a result of unbalanced and relative smaller sample sizes, and the implications it had on the conclusions drawn from the data results, are to be addressed in further research. Furthermore, the observed levels of η^2 in Study 13, as a slightly biased, alternative measure to the estimate of effect size ω^2, remained at a moderate level[2]. Given that the effect size is intrinsically linked not only to the sample size, but also to the probability level α, and the statistical power of the test, it was deduced earlier, that at a given α, the small effect size affects the statistical power, hence the tenability of conclusions inferred from the data. Furthermore, as an issue affecting statistical conclusion validity, not all assumptions underlying the statistical tools that were used, could be met. In a number of observations, the assumption of normality was violated, although still within criteria set in Chapter 8.4.1.1., where at least ¾ of observed Groups appeared to meet these criteria. In addition, it was noted that the confidence interval of the contrast estimate in the Planned-Comparison between the Experimental Group EG_{O4D} and the Control Group CG_{O4E} at the posttest condition, that was indicative of an important, significant result in the Study, was nonetheless rather large and therefore contained values that were rather distinct from each other. As a result, the exact effects of the treatment condition, although significant, would need further observation through additional research. A third and final threat to conclusion validity, was a potential weakness in the treatment implementation that allowed for an individualized approach, after the Actor-Intervener had gained extensive experience with the structured format of the interview, possibly affecting a correct procedure, and a limited opportunity for assessing these effects, as a consequence of the strict confidentiality adhered to in the interview[3].

To improve validation, the analysis in the original research referred to in Mennes (2016, *in press*), was extended with Study 14, replicating the quasi-experimental setting, and aimed especially at increasing both effect size and statistical power.

[1] These threats to construct validity are identified as, respectively: Mono-Operation Bias, Mono-Method Bias, Reactive Self-Report Changes, Reactivity to the Experimental Situation and Novelty and Disruption Effects, with reference to Shadish, Cook & Campbell (2002).

[2] The effect size estimates η^2 in Study 13 generally ranged between *.04* and *.09*. According to Cohen 1988, 1992 these effect size estimates (corresponding to *r=.2* and *r=.3)* can be defined as 'a small to medium effect'.

[3] These threats to statistical conclusion validity are identified as Low Statistical Power, Violated Assumptions of Statistical Tests, and Unreliability of Treatment Implementation, with reference to Shadish, Cook & Campbell (2002).

4. Conclusion

Although a number of limitations remained, affecting validity in assessing the effects of treatment, Study 13 provided evidence for a cause-and-effect relation to exist between an application of Instruments and a successful Management of the Process of Motivation.

In three comparable phases to the ones performed in Study 12, hypotheses defined in Chapter 8.4.3., were found to be confirmed in Study 13.

In a pretest-posttest design, controlling for a number of threats to validity, an important decline in Motivation seems to have occurred, as captured by factor score DEDICAT, between pretest and posttest Time-of-Measure, whereas these levels appear to have significantly increased in the Experimental Group with a four-fold exposure to the Instrumentation in the posttest condition. Intermediate effects emerged for the Experimental Groups with a single, a two-fold and a three-fold exposure to treatment in the posttest condition, revealing a trend where increased exposure led to increased Motivation. It was assumed that these findings were an effect of the experimental manipulation and were unlikely to have arisen by chance. As a principal result of Study 13, Hypothesis H1D was therefore assumed valid, confirming the assumption that addressing the Process of Motivation by means of an Instrumentation consisting of a training setting for the Actor-Intervener followed by a four-fold exposure of the Individual to a structured interview, leads to a significantly higher Motivation within the Experimental Group as compared to a Control Group that had no such exposure.

8.5.3. Study 14: Comparative Analysis Dependent Measures *Diversification in Treatment Groups*

Referring to Mennes (2016*, in press*), notably Chapter 14.5.3., Study 14 was the third of a series aimed at verifying the assumption of a cause-and-effect relation between an application of Instruments and a successful addressing of the Process of Motivation. Study 14 aimed at providing a supplemental evidence for the findings from Study 13, in a dependent research design that would reduce the unsystematic variation created by random factors, thus enabling greater power to detect effects, which was considered a major deficit of Study 13, as briefly mentioned in Chapter 8.5.2.3. As stated Chapter 8.4., a summary is provided, supplementing the findings from Study 13.

In the Comparative Analysis three approaches were taken:

In an introductory Two-way mixed design ANOVA, the Experimental and Control Groups were observed on a between-subjects factor Group (Experimental Groups and Control Group) over a within-subjects factor Time-of-Measure (pretest condition and posttest condition), to test if differences could be observed between the various Groups over time. There was a non-significant between-subjects main effect for Group, $F(4,61)=0.02$, $p=.99$, $\eta_p^2=.001$, and a non-significant within-subjects main effect for Time-of-Measure, $F(1,61)=0.04$, $p=.84$, $\eta_p^2=.001$. The level of Motivation, as captured by factor score component DEDICAT was comparable across Groups when

one ignores the time at which DEDICAT was measured, and no differences appeared in Motivation levels over time if exposure to treatment and differences between the various Groups were ignored. The interaction effect of Group with Time-of-Measure, however, provided a significant effect, $F(4,61)=4.34$, $p<.01$, $\eta_p^2=.221$, indicating that the observed change in Motivation over time, as captured by DEDICAT, appeared to be different amongst the various Groups observed.

Subsequently, with these first observations that significant differences in Motivation occurred within the various Groups over time, repeated-measures MANOVA, with simple main effects analyses were performed, testing which of the various Experimental and Control Groups differed at pretest and posttest conditions. In assessing the effects of a factor Time-of-Measure on pre- and posttest conditions at each distinct level of treatment, it appeared a repeated-measures MANOVA, with simple main effects analyses produced mostly non-significant results within Experimental Groups at various levels of exposure to treatment, whereas pronounced differences were obtained within the Control Group on factor score component DEDICAT. Using Pillai's trace, there was a non-significant effect of time for the Experimental Group with a single exposure to treatment, as measured before and after the experiment, $V=0.04$, $F(1,61)=2.68$, $p=.11$, $\eta_p^2=.034$. Same results appeared, for remaining Experimental Groups. Using Pillai's trace, the simple main effects analyses, produced for the Experimental Group with a two-fold exposure to treatment, $V=0.05$, $F(1,61)=3.24$, $p=.08$, $\eta_p^2=.041$, for the Experimental Group with a three-fold exposure to treatment, $V=0.00$, $F(1,61)=0.13$, $p=.72$, $\eta_p^2=.002$, and for the Experimental Group with a four-fold, or higher, exposure to treatment, $V=0.00$, $F(1,61)=0.08$, $p=.78$, $\eta_p^2=.001$. In contrast, however, the simple main effects analysis of time on Motivation within the Control Group revealed a significant difference at $p<.001$ on DEDICAT, $V=0.16$, $F(1,61)=11.24$, $p<.001$, $\eta_p^2=.144$. These data, then, appeared to be indicative of a significant change in Motivation within the Control Group, as opposed to relatively unaltered levels of Motivation in the various Experimental Groups.

To further evaluate these differences between Experimental Groups and Control Groups, Repeated-measures planned-comparison MANOVA analyses were performed of a factor Time-of-Measure within a factor Group, where distinct Experimental Groups were compared to the Control Group on effects over time, between pretest and posttest conditions. Respective outcomes for the different comparisons in time of the Experimental Groups with a single, a two-fold and a three-fold exposure to treatment on factor score component DEDICAT, versus the Control Group provided significant results, with $t(61)=3.24$, $p<.01$ (two-tailed), $\eta_p^2=.147$, $t(61)=3.77$, $p<.001$ (two-tailed), $\eta_p^2=.189$, and $t(61)=2.10$, $p<.05$ (two-tailed), $\eta_p^2=.068$, respectively. The Experimental Group with a four-fold exposure to treatment, however, failed to reach significance in comparison to the Control Group with $t(61)=1.84$, $p=.07$ (two-tailed), $\eta_p^2=.052$. A further analysis suggested, however, that inadequate sampling appeared to have affected these results. Following recommendations from literature, the Experimental Groups with a three-fold and four-fold exposure to treatment, both with sample sizes below n=12, were merged into a single Experimental Group of subjects having had a three-fold exposure, or more, to the treatment condition, producing significant results versus the Control Group, with $t(61)=2.40$, $p<.05$ (two-tailed), $\eta_p^2=.085$.

In accordance with previous findings, no significant results were obtained in the various analyses for factor scores associated with component ACHIEV.

From the analysis, then, it appeared the various Treatment Groups differed in comparison to the non-Treatment Group in effects over time, as implied from the findings obtained from the previous simple effects analyses, thus re-confirming earlier findings from Study 12 and Study 13.

8.6. Summary

Chapter 8., aimed at a validation of specific Instruments enabling Intrinsic Intervention Competencies within an Intrinsic Modality in Management of Motivation.

The validation of Instruments was to provide an indication for a causal relation to exist between application of Instruments defined as a training setting and a structured interview, and the occurrence of a successful Intervention within the Process of Motivation.

A brief synopsis was provided of Study 12, Chapter 8.5.1., referring to the original research Project detailed in Mennes (2016, in press), notably Chapter 14.5.1.

Study 13, Chapter 8.5.2., consisted of a Comparative Analysis Independent Measures to provide a Diversification in Treatment Groups assessing the effects of a single, a two-fold, a three-fold and a four-fold, or higher, exposure to the treatment condition. Confirmation was found for hypothesis H1D, defined Chapter 8.4.3., which assumed that addressing the Process of Motivation by means of a four-fold, or higher, exposure to the Instruments, would lead to a significantly higher Motivation within the Experimental Group as compared to Control Groups that would have had no exposure.

The Comparative Analysis was performed in three phases:

- *In an introductory One-way independent ANOVA, testing a principal Experimental Group versus Control Group in both pretest and posttest settings, there was a significant effect of the treatment condition on Motivation as captured by factor score component DEDICAT, $F(1, 59)=5.97$, $p<.05$, $\eta^2=.092$, on the posttest condition, as compared to $F(1, 70)=0.07$, $p=.79$, $\eta^2=.001$, on the pretest condition.*
- *Subsequently, a Planned-Comparison for One-way independent ANOVA was performed, allowing for an analysis with Diversification in Treatment Groups. The Planned-Comparison was performed to assess effects of treatment in three analyses:*
  - *A Planned-Comparison for the combined Experimental Groups versus the Control Group, revealed a significant difference for the Experimental Groups after treatment, with $t(165)=2.14$, $p<.05$ (two-tailed), $\eta^2=.037$, as captured by factor score component DEDICAT, whereas no significant differences appeared in the pretest setting, with $t(175)=-.16$, $p=.87$ (two-tailed), $\eta^2=.003$.*
  - *A Planned-Comparison for the separate Experimental Groups versus a Control Group, revealed a gradual effect on Motivation. Planned-Comparisons between the various Experimental Groups and the Control Group in the posttest setting produced following results, with $t(165)=-1.60$, $p=.11$ (two-tailed), $\eta^2=.037$ for a single exposure to treatment, with $t(165)=-1.68$, $p=.10$ (two-tailed), $\eta^2=.037$ for a two-fold exposure, with $t(165)=-.82$, $p=.42$ (two-tailed), $\eta^2=.037$ for a three-fold exposure, and with $t(165)=-2.35$, $p<.05$ (two-tailed), $\eta^2=.037$ for a four-fold or higher*

exposure to treatment respectively, as opposed to non-significant results in the Planned Comparison in the pretest condition, with respective outcomes for the different comparisons t(175)=.23, p=.82 (two-tailed), η^2=.003, t(175)=-.31, p=.75 (two-tailed), η^2=.003, t(175)=.34, p=.73 (two-tailed), η^2=.003, and t(175)=.25, p=.80 (two-tailed), η^2=.003.

- *Given the sequential order in which the Treatment Groups could be observed, a Trend-analysis using polynomial contrasts was provided, restricted to a basic linear trend in the value of the dependent variable across the four Treatment categories. A significant linear trend could be observed on posttest, F_{LIN} (1,165)=4.19, p<.05, η^2=.037, as opposed to F_{LIN} (1,175)=0.07, p=.79, η^2=.003 on pretest, indicating that as the treatment condition and exposure to the Instruments increased, Motivation, as captured by factor score component DEDICAT, increased proportionally.*

- *Finally, in a third and final phase of the Comparative Analysis, a Two-way independent factorial ANOVA was performed, evaluating the interaction of pre- and posttest variables and the effects of these interactions on the observed factor score component DEDICAT, capturing Motivation. A non-significant effect for the model in general was obtained, with F(3, 346)=1.95, p=.12, η^2=.017, indicating that exposure to treatment per se, was not a sufficient condition for an increased Motivation to occur. In observing the effects of more frequent exposures, significant results emerged in the factorial ANOVA of Experimental Groups with at least a four-fold exposure, where a significant effect for the model in general was obtained, with F(3, 129)=2.69, p<.05, η^2=.059. Relevant to the analysis of pretest and posttest related effects between Treatment Group and non-Treatment Group, was a significant interaction effect observed between Experimental and Control Groups on pretest and posttest Time-of-Measure in the level of Motivation, F(1, 129)=4.62, p<.05, η^2=.035.*

Again, no significant results were obtained in the various analyses for factor scores associated with component ACHIEV on pretest and posttest conditions.

Finally, a brief synopsis was provided of Study 14, Chapter 8.5.3., referring to the original research Project detailed in Mennes (2016, in press), notably Chapter 14.5.3.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research produced evidence for a causal relation to exist between isolated constructs operationalizing the Process of Motivation and concepts operationalizing the exemplary Instrumentation.

Providing evidence for these exemplary Instruments is the key finding of the fourth empirical research of this dissertation.

In addition, these findings provide secondary empirical evidence in support of the Model of Motivation, from which these exemplary Instruments were derived.

Chapter 9
Conclusions

9.1. Introduction

The objective of the study was initially formulated in a two-fold Problem Definition Chapter 2.2.:

- *This dissertation was to aim, as its primary objective, at providing insights into the concept of Motivation,*
- *to unveil elementary processes involved in addressing Motivation.*

Through a series of Fundamental Assumptions the field of study was reduced to a Process of Motivation addressed by a Process of Interference, to be observed in its constituent components. The Process of Motivation was to be observed separately from the Process of Interference that was assumed to consist of three sequential Determinants.

As stated Chapter 1.5., the dissertation proclaims a reintroduction of inductive inference in the generation of comprehensive explanatory theoretical Models at the basis of empirical research. In a clear demarcation from hypothetico-deductive hypothesis testing, from these Models, critical hypotheses are derived. Support from empirical research for an embedded hypothesis thus reflects on the robustness of the explanatory framework or Model. Multiple hypotheses, within multiple empirical studies, embedded in a common explanatory Model further add to its authority.

Thus, a four-fold Problem Statement was defined, each consisting of a theoretical Model and associated hypotheses.

In concluding this dissertation, results are observed to determine if the insights and findings called for in the Problem Statement have been adequately met, and, ultimately, to determine if the objectives of the study have been reached.

In defining these Principal Conclusions, the Problem Statement, formulated Chapter 2.5., is used as a reference.

9.2. Overview of Principal Conclusions
With Reference to the Problem Statement
9.2.1. The Process of Motivation

This dissertation was to provide, as its primary objective, insights into the Process of Motivation, by means of:

- *A theoretical Model, as obtained through inductive inference, provided in a summarized overview. The overview was provided in Chapter 3, revealing a*

sequential, cyclical Process evolving around an objective and consisting of 24 Stages, clustered in 8 Phases.

- *An embedment in current literature, that was to be provided by a brief, annotated overview of principal findings. These Principal findings from literature were provided in Chapter 4. Following the analysis in Chapter 4.4., a vast majority of current theories from literature on human Motivation was found to be covered within the 24 Stages of the Model of Motivation. The analysis of the empirical research in Chapter 4.5. provided a sustained confirmation for the various Phases of the Model and their assumed effects on Motivation. It was concluded that the assumptions made in the Model of Motivation, appeared to have been supported by a majority of findings from empirical research in literature.*
- *Empirical research that was to provide evidence of the elementary constructs, from the Model, in terms of components and their respective items, capturing the Process of Motivation, thus providing empirical evidence in support of the Model of Motivation.*

  Following observations made in Chapter 5.2., critical elements associated to the Model of Motivation were captured in hypotheses provided Chapter 5.4.3. The empirical research in Chapter 5 was performed in two stages:
  - *Study 1, in Chapter 5.5.1., aimed at providing evidence of elementary constructs, capturing Motivation in its essence. It was hypothesized that the elementary components reduced from a primary Core Data-set, would include all items associated with a theoretical categorization of the most important Phases of the Model, i.e. Phases 3 and 8, as defined in hypothesis H1A., Chapter 5.4.3. All items associated with both Phases were found to be included in primary components produced by the PCA.*
  - *Study 2, in Chapter 5.5.2., provided evidence formulated in hypothesis H1B, Chapter 5.4.3., where a perfect match was obtained between the two primary components, designated as 'DEDICAT" and 'ACHIEV', indicative of Phases 3 and 8 of the Process of Motivation. A further verification of these findings was pursued:*
    - *In Study 3, Chapter 5.6.1., by hypothesizing that these findings would be unrelated to performance, formulated in hypothesis H2A, Chapter 5.4.3., where a partial confirmation was obtained;*
    - *In Study 4, Chapter 5.6.2., by hypothesizing that these findings would be unrelated to cultural influences, hypothesis H2B, Chapter 5.4.3., with confirming evidence obtained at three different locations world-wide: in Malaysia, South-Africa and the USA;*
    - *In Study 5, Chapter 5.6.3., by hypothesizing that these findings would be unrelated to specific company-related influences, hypothesis H2C, Chapter 5.4.3., with confirming evidence obtained in differentiated companies.*
  - *In Study 6, Chapter 5.7.1., a suitable course of action was defined in generating factor scores to be used in subsequent analyses.*

In conclusion, with hypotheses H1A and H1B confirmed, and substantial evidence

supporting hypotheses H2A, H2B and H2C, following the statements made in Chapter 5.4.3., it was found that both components DEDICAT and ACHIEV could be designated as the essential constructs in capturing the Process of Motivation.

Following the Problem Statement defined in Chapter 2.5. the empirical research provided evidence, then, that components DEDICAT and ACHIEV as obtained from the analysis, were indicative of Phases 3 and 8 of the Process of Motivation, and were the elementary constructs that capture the Process of Motivation, thus providing first empirical evidence in support of the Model of Motivation.

As a Principal Conclusion, then, the insights in the Process of Motivation called for in the Problem Statement, Chapter 2.5., are assumed to have been met, with reference, however, to critical observations made in the Discussions associated with various the Studies.

9.2.2. Conditions

Referring to the Problem Statement, Chapter 2.5., from these insights, the dissertation was to unveil elementary processes involved in addressing Motivation, by subsequently providing insights in the Process of Interference.

Providing insights in the Process of Interference was to consist of:

First, insights into Conditions necessary for effects to occur within the Process of Motivation, by means of:

- *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, that was to be provided in a summarized overview. The overview was provided in Chapter 6.2.2., revealing four distinct Conditions, elementary in addressing Motivation.*
- *Empirical research that was to provide evidence of the relation between the isolated constructs operationalizing the Process of Motivation and concepts presumed to be indicative of the Conditions.*
  Following observations made in Chapter 6.2.3., critical elements associated to the theoretical Model were captured in hypotheses provided Chapter 6.4.3.
  The empirical research was performed in three consecutive stages:
  - *Study 7, in Chapter 6.5.1., consisted of an exploratory research that aimed at providing an Inventory of all aspects, or so-called 'Elements', that could possibly affect an Intervention.*
  - *It was assumed that a number of those Elements would be active in instigating Motivation, thus would display a relation with constructs DEDICAT and ACHIEV obtained from Chapter 5, capturing the Process of Motivation. In Study 8, Chapter 6.5.2. a confirmation could be found, formulated in hypothesis H1, Chapter 6.4.3. Although Conditions were assumed to affect both components DEDICAT and ACHIEV that were to capture Motivation, it was hypothesized that a difference would occur in the extent at which both components were affected, as observed in the*

Model of Motivation. A confirmation was found for these assumptions, formulated in hypothesis H2, defined Chapter 6.4.3., with an observation, however, that Elements appeared to display a correlation with component DEDICAT, and some correlations were found with component ACHIEV, but none of these met criteria initially set.

- *Where Motivation was assumed to be initiated by one or more of the four Conditions obtained from the inductive inference, it was hypothesized that a vast majority of the obtained Elements had to be related directly or indirectly to one or more of these four Conditions. A verification of these findings was obtained in Study 9, Chapter 6.5.3., confirming hypothesis H3A, defined Chapter 6.4.3. However, no confirmation could be obtained for hypothesis H3B, Chapter 6.4.3., in items correlated to ACHIEV.*

In conclusion, with hypotheses H1 and H2 confirmed, and substantial evidence supporting hypothesis H3A, following the statements made in Chapter 6.4.3., it was found that correlational evidence was obtained for the assumed relation.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided exploratory and descriptive correlational evidence for a relation between constructs capturing Motivation and Conditions enabling an adequate Intervention within the Process of Motivation.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these Conditions were derived.

As a Principal Conclusion, then, the first insights on Conditions in the analysis of the Process of Interference called for in the Problem Statement, Chapter 2.5., are assumed to have been obtained, with reference, however, to critical observations made in the Discussions associated with the various Studies.

9.2.3. Competencies

Referring to the Problem Statement, Chapter 2.5., the dissertation was to provide insights in the Process of Interference consisting of:

Secondly, insights in Competencies initiating the Conditions to come into effect, by means of:

- *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, that was to be provided in a summarized overview. The overview was presented in Chapter 7.2.2., revealing that two distinct approaches, or Modalities, could be observed in addressing Motivation:*
  - *An Extrinsic Modality in Management of Motivation, consisting of:*
    - *An Extrinsic Attitudinal Competency;*
    - *Extrinsic Technical Competencies.*
  - *An Intrinsic Modality in Management of Motivation, consisting of:*
    - *Intrinsic Attitudinal Competencies;*
    - *Intrinsic Technical Competencies.*

- *Empirical research that was to provide evidence of the relation between concepts presumed to be indicative of Conditions and concepts operationalizing the Competencies.*
  Following observations in Chapter 7.2.3., critical elements associated with the theoretical Model were captured in hypotheses provided Chapter 7.4.3.
  The empirical research in Chapter 7.5. was performed in two stages:
  - *The Conditions were operationalized in a single concept, in order to avoid co-variation and conceptual overlap. A first Preliminary Analysis in Study 10, Chapter 7.5.1., aimed at a verification of this single concept: First of its presumed suitability capturing the distinct Conditions; The analysis confirmed the proposed single concept to be an adequate representation of the targeted Conditions. Second, of the relation between the single concept and Motivation as expressed in factor scores, following the analysis in Chapter 5; In the analysis the assumed inherent relation could be established.*
  - *A second analysis consisted of an overview of relations between the single concept capturing Conditions and the more specific concepts capturing all Competencies, both Attitudinal and Technical, following an Extrinsic and Intrinsic approach using multiple regression procedures. Study 11, Chapter 7.5.2., revealed significant support for the two sets of Competencies suggested in both Extrinsic and Intrinsic Modalities.*
    In observing Extrinsic Intervention Competencies:
    - *A first regression analysis provided support for the assumption that the single Extrinsic Attitudinal Competency was positively related to the single concept capturing the targeted Conditions, as formulated in hypothesis H1A, Chapter 7.4.3.;*
    - *In a second series of regression analyses evidence was obtained in support of the assumption that the Extrinsic Technical Competencies were positively related to the single concept capturing the targeted Conditions, as formulated in hypothesis H1B, Chapter 7.4.3.*

    In observing Intrinsic Intervention Competencies:
    - *Regression analysis provided support for the assumption that the Intrinsic Attitudinal Competencies were positively related to the single concept capturing the targeted Conditions, formulated in hypothesis H2A, Chapter 7.4.3.:*
    - *In a final regression analysis evidence was obtained in support of the assumption that the Intrinsic Technical Competencies were positively related to the single concept capturing the targeted Conditions, as formulated in hypothesis H2B, Chapter 7.4.3.*

In conclusion, then, with hypotheses H1A, H1B and H2A, H2B confirmed, and following the statements made in Chapter 7.4.3., it was found that substantial evidence was obtained for establishing the assumed relations.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided evidence for establishing a relation between concepts presumed to be indicative of Conditions enabling Motivation and concepts operationalizing these

Competencies.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these Competencies were derived.

As a third Principal Conclusion, then, the insights in the analysis of the Process of Interference, of Competencies initiating Conditions necessary for an effect to occur called for in the Problem Statement, Chapter 2.5., are assumed to have been obtained, with reference, however, to critical observations made in the Discussions associated with the various Studies.

9.2.4. Instruments

Referring to the Problem Statement, Chapter 2.5., the dissertation was to provide insights in the Process of Interference consisting of:

Thirdly, insights into exemplary Instruments that provide the means for these Competencies to occur, by means of:

- *a theoretical Model based on the Model of Motivation, as obtained through inductive inference, that was to be provided in a summarized overview. The overview was presented in Chapter 8.2.2., revealing an Instrumentation aimed at an Intrinsic Modality in Management of Motivation, consisting of a training setting and a structured interview.*
- *Empirical research that was to provide evidence for a causal relation to exist between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing the Instruments.*
  Following observations in Chapter 8.2.3., critical elements associated with the theoretical Model were captured in hypotheses provided Chapter 8.4.3.
  An optimal research design was defined based on criteria of internal, external, construct and statistical validity. The empirical research in Chapter 8.5. consisted of a series of Comparative Analyses:
  - *A brief synopsis was provided of Study 12, Chapter 8.5.1., referring to the original research Project detailed in Mennes (2016, in press).*
  - *In Study 13, Chapter 8.5.2., a sequence of Comparative Analyses Independent Measures confirmed hypothesis H1D, defined Chapter 8.4.3., where a four-fold, or higher, exposure to Treatment was assumed to lead to a significantly higher Motivation.*
    No significant results were obtained in the various analyses for factor scores associated with component ACHIEV on pretest and posttest conditions.
  - *A brief synopsis was provided of Study 14, Chapter 8.5.3., referring to the original research Project detailed in Mennes (2016, in press).*

In conclusion, with hypothesis H1D confirmed in Study 13, following the statements made in Chapter 8.4.3., it was found that evidence was provided for a causal relation assumed to exist between an application of Instruments and a successful Intervention

within the Process of Motivation.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research produced evidence for a causal relation to exist between isolated constructs operationalizing the Process of Motivation and concepts operationalizing the exemplary Instrumentation.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these exemplary Instruments were derived.

In a final Principal Conclusion, then, insights in the analysis of the Process of Interference, of exemplary Instruments enabling Competencies that would initiate Conditions necessary for an effect to occur in the Process of Motivation, as called for in the Problem Statement Chapter 2.5., are assumed to have been obtained, with reference however, to critical observations made in the Discussions in Study 13.

9.3. Summary of Principal Conclusions

In four Principal Conclusions, then, it was assumed that insights have been obtained called for in the Problem Statement, as defined Chapter 2.5.

The study appears to provide evidence:

- *that the Process of Motivation, as represented by a Model obtained in an inductive inference and supported by findings from literature, produced through empirical research the elementary constructs from the Model, capturing Motivation, which transformed the complex concept into a measurable entity;*
- *that based on the Model of Motivation, Determinants from the Process of Interference could be derived:*
  - *Four Conditions, supported by results obtained from empirical research, that enabled an adequate addressing of the Process of Motivation;*
  - *Attitudinal and Technical Competencies, specifically defined within two Modalities in Management of Motivation, an Extrinsic Modality and an Intrinsic Modality, supported by findings from empirical research;*
  - *And, within an Intrinsic Modality, an exemplary Instrument that produced a significant effect in Management of Motivation.*

  Thus providing secondary empirical evidence in support of the Model of Motivation, from which these Determinants were derived.

Consequently, it is concluded the objectives of this dissertation have been reached.

With these results adding to the robustness of the explanatory theoretical Model of the Process of Motivation and its derived Process of Interference, a number of Implications ex post inferred from the theoretical Model are to be presented, in accordance to observations made in Chapter 1.5. These Implications are to follow the main Summary that is to conclude the dissertation in Chapter 10.

Chapter 10
Summary

10.1. Introduction

This dissertation finds its raison d'être in the observation that precious few elementary new insights have been generated to prevent the human condition from recurrent suffering throughout the course of its history, ranging from atrocities of war, discrimination, genocide to poverty, exploitation and excessive injustice.

If these acts, in spite of their content and nature, are considered to be expressions of man's will to intervene in his surrounding, research and theory on these phenomena can be defined within a socio-psychological tradition, and confined to a field of study conceptualized in literature as 'Human Motivation'.

Precious few elementary new insights have been generated to prevent a recurrence of human suffering through atrocities of war, genocide, poverty and have the human condition thrive and prosper in a better world.

The purpose of this study has been to initiate further thought and understanding in the field of Human Motivation. It's objective has been two-fold:

- The dissertation aimed, as its primary objective, at providing insights into the concept of Motivation,
- to unveil elementary processes involved in addressing Motivation.

Research and theory aimed at providing knowledge and insights on recurrence of phenomena of war, discrimination, genocide, injustice, exploitation and poverty, can be defined within a socio-psychological tradition and confined to a field of study conceptualized in literature as 'Human Motivation'.

To this aim a fundamental departure from common practice and from a traditional scientific approach has been taken in generating the insights that are at the core of the study and of its empirical research and validation.

In the second half of the twentieth century, Empirical falsifiability became the criterion of the scientific character of theories. Where 'scientific philosophy' expanded beyond its boundaries towards a restricted 'scientific methodology', deductive inference became predominant and inductive theory-formation was gradually largely abandoned from scientific practice.

This dissertation seeks to re-integrate inductive and deductive inference strategies. The study proclaims a reintroduction of inductive inference in the generation of explanatory theoretical constructs, or theoretical 'Models'. Where these theoretical Models lead to clearly defined and constrained hypotheses, they constitute not a departure from, but rather a re-enrichment of hypothetico-deductive tradition. In lieu of observing isolated hypotheses, as emphasized in a traditional hypothetico-deductive approach, this study proposes a foundation, or embedment, of hypotheses in an inductively inferred theoretical

Model, which provides an explanatory framework for phenomena these hypotheses seek to validate. Support from empirical research for an embedded hypothesis thus reflects on the robustness of the explanatory framework or Model. Multiple hypotheses, within multiple empirical studies, embedded in a common explanatory Model, further add to its authority.

A re-introduction of inductive inference in generation of explanatory theoretical Models, will lead to enrichment of a current hypothetico-deductive tradition in the social sciences, the study of human motivation in particular.

In lieu of observing isolated hypotheses, as emphasized in a traditional hypothetico-deductive approach, hypotheses are to be embedded in an inductively inferred theoretical Model, which provides an explanatory framework for phenomena these hypotheses seek to validate.

Support from empirical research for an embedded hypothesis thus reflects on the robustness of the explanatory Model. Multiple hypotheses, within multiple empirical studies, embedded in a common explanatory Model further add to its authority.

The rationale behind the re-integration of inductive and deductive inference practice constitute the 'Pre-Fundamentals' of this study, as elaborated on in Chapter 1.

A number of restrictions to the study, or 'Fundamental Assumptions', were formulated subsequently, Chapter 2. Within the concept of Motivation a distinction was made into a 'Process of Motivation' that manifests itself within an 'Individual', and a process aimed at addressing, or interfering in Motivation by an external 'Actor-Intervener', defined as a 'Process of Interference'. Within the Process of Interference three distinct 'Determinants' were defined:

- 'Conditions', initiating 'Intervention' in the Process of Motivation;
- 'Competencies', enabling these Conditions;
- 'Instruments', to facilitate these Competencies.

Human Motivation conceptually consists of two distinct processes: a Process of Motivation that manifests itself within an Individual, and a process aimed at addressing, or interfering in Motivation by an external Actor-Intervener, defined as a Process of Interference.

This sequential reduction restricted the course of this study to a four-fold approach in the analysis.

Thus, in Chapter 2.5., the Problem Statement of this dissertation was formulated, reflecting the four-fold approach in analyzing the Process of Motivation, distinct from the Process of Interference in its three Determinants, to obtain the two-fold objective of the dissertation.

Failure to distinguish conceptually between a Process of Motivation and a Process of Interference in current literature has caused profound Conceptual Confusion in research and theory on Human Motivation.

Insights into the Process of Motivation were to be provided by means of an explanatory theoretical Model, an embedment in literature, and empirical validation of hypotheses derived from the explanatory framework of the Model, thus reflecting on its robustness.

Likewise, insights into the Process of Interference and its Determinants were to be provided by means of a theoretical Model, and empirical validation of derived hypotheses. However, as all Determinants were theoretically derived from the Model of Motivation, hypotheses associated to each Determinant were to provide not only insights into the Process of Interference, but would also provide a means of verification of the theoretical

Model of Motivation where multiple empirical studies, derived from a common explanatory Model, were assumed to further add to its authority.

The approach, then, has led to a four-fold sequence in hypothesis-testing, covering:

- The Process of Motivation,
- Conditions initiating the Process of Motivation,
- Competencies enabling these Conditions,
- Instruments providing the means for these Competencies to occur.

10.2. The Process of Motivation

In the Problem Statement, formulated Chapter 2.5., this dissertation was to provide first, as its primary objective, insights into the Process of Motivation, by means of a theoretical Model, an embedment in current literature, and empirical research.

Initially, the Process of Motivation was defined as a Process that intentionally orients the Individual within a Situation. A series of Assumptions led to a representation of this Process as a vector, assuming separate conceptual entities emerge when a change in the properties of this vector would occur. From these Assumptions, in Chapter 3.2., Motivation was presented as a Process progressing in distinct, consecutive steps, or so-called 'Stages', each Stage differentiated from the other on the properties of its vector.

The theoretical Model of Motivation, in Chapter 3.3., was assumed to evolve around an objective, and to proceed in twenty-four consecutive Stages that could be organized according to eight distinct groups or 'Phases'.

- *A Phase of Expectancies:* a first Phase was assumed to be characterized by a mental evaluative process, where, in an iterative search, gradually the objective was defined. In a cyclical assessment the Individual determined the effort needed to reach the objective, and the objective and subjective revenues the Individual was to expect from this achievement
- *A Phase of Effort:* this process of mentally balancing expected gains and losses, in a number of cases led to an actual investment: in this Phase the Individual was to proceed into action.
- *A Phase of Internally Evoked Self-Assessment:* these concrete activities, or behaviors, were subsequently assessed on their effectiveness of reaching the objective set, in terms of perceived Achievement and Failure, or Satisfaction and Frustration. And this third Phase, in turn, led to a re-assessment of the parameters initially set in a first Phase of Expectancies, thus turning the process of Motivation into a cyclical system.
- *A Phase of Reality:* Within this cocooned balance, however, an external unexpected event was assumed likely to occur and to disrupt this entirely self-regulated process. 'Reality' was defined as the external surrounding of the Individual affecting the process of Motivation. The event was assessed on its perceived importance, in terms of 'Significance of Reality'.
- *A Phase of Impact:* depending on its ‘Significance’, assessed in a ‘Phase of Reality’, effects of the event on the process were evaluated in a ‘Phase of Impact’. Both assessments were often tightly related, with a modest Significance of Reality having low Impact, and a high Significance resulting in high Impact.

- *A Phase of Externally Evoked Self-Assessment:* in a first response, initial parameters defined in a Phase of Expectancies were re-examined on their effectiveness.
- *A Phase of Anticipated Change:* in a second response, an assessment was made of one's willingness to make adjustments to these initial settings.
- *A Phase of Dedication:* in the eighth and last Phase of the Process, the Individual was assumed to assess, as a consequence of previous Phases, perceived support from Reality, which in turn, led to a re-setting of initial parameters in the first Phase of Expectancies, thus turning the Process of Motivation into a cyclical process.

Human Motivation, in short, was perceived of as an 'inner dialogue', a stepwise, sequential Process of eight distinct Phases, largely evaluative in nature, where the Individual attempts to reach and secure an objective set, and to limit the effects of outside interferences. The importance, or 'Significance' attached to the objective, further regulated this process. Mechanisms of Anticipation, Representation and Coping aimed at reducing Impact, or 'Discrepancy', between the objective and a perceived Reality.

The Process of Motivation is assumed to be an intentional, oriented activity aimed at reaching and fulfilling an objective set. The Process is conceived of as an 'inner dialogue', largely evaluative in nature, where the Individual attempts to reach and secure an objective set, and to limit the effects of outside interferences. The Process is assumed to proceed in 24 distinct, consecutive steps or so-called 'Stages', which can be organized in 8 groups or 'Phases'.

This theoretical Model of Motivation was reflected on through an analysis of current literature in Chapter 4. Elements from the model were connected to findings from literature, provided largely through empirical research. Thus an embedment could be obtained within an existing body of knowledge, with its findings secured with empirically validated data. Following the analysis in Chapter 4.4., a vast majority of current theories from literature on human Motivation was found to be covered within the 24 Stages of the Model. The analysis of the empirical research in Chapter 4.5. provided sustained confirmation for the various Phases of the Model and their assumed effects on Motivation. As a general conclusion, then, the Model of Motivation appeared to have been supported by a majority of theories and research findings.

In a final observation, from a slightly different perspective, it was found that in the attempt at coverage and embedment, the Model of Motivation provided a comprehensive conceptual framework for classification of current theories on human motivation.

The Model of Motivation provides a comprehensive conceptual framework for classification of current theories of Human Motivation in literature.

Following the Problem Statement, Chapter 2.5., an empirical research was to provide evidence of the elementary constructs, from the Model, in terms of components and their respective items, capturing the Process of Motivation, thus providing empirical evidence in support of the Model of Motivation. Following observations made in Chapter 5.2., critical elements associated with the Model of Motivation were captured in hypotheses provided Chapter 5.4.3.

The empirical research in Chapter 5.5. was performed in two stages.

In Study 1, Chapter 5.5.1., aimed at a verification of hypothesis *H1A*, formulated

Chapter 5.4.3., it was hypothesized that the elementary components reduced from a data-set, would include all items associated with a theoretical categorization of the most important Phases of the Model, i.e. Phases 3 and 8, as suggested as a primal hypothesis in Chapter 3.3.4. A primary Core Data-set, was reduced to elementary components by means of PCA, using nonorthogonal rotation techniques. After eliminating components that did not meet internal consistency reliability standards, two primary components were isolated, designated as DEDICAT *(Initial eigenvalues 11.836, Alpha coefficient for final components .90),* and ACHIEV *(Initial eigenvalues 3.473, Alpha coefficient for final components .78)*, which were found to include all items associated with both Phases 3 and 8 from the Model of Motivation, thus providing confirmation for hypothesis *H1A*.

In Study 2, Chapter 5.5.2., a comparative analysis was performed between both primary components DEDICAT and ACHIEV, and those hypothetically defined prior to the analysis to operationalize Phase 3 and Phase 8 from the Model of Motivation, to obtain evidence if both primary components were the elementary constructs capturing the Process of Motivation, as called for in the Problem Statement. A perfect match was obtained, in support of hypothesis *H1B*, Chapter 5.4.3., where both clusters of items matched completely, in a comparison between clusters of items capturing Phase 3, and Phase 8, respectively, within the Model of Motivation, and those obtained from the PCA designated as component DEDICAT and ACHIEV. In a Comparative Analysis of Matrices, both comparisons generated a sensitivity and specificity of 100%, resulting in Φ and λ scores significant at $p<.01$.

A further verification of these findings was pursued:

- In Study 3, Chapter 5.6.1., by hypothesizing that these findings would be unrelated to performance, formulated in hypothesis *H2A,* Chapter 5.4.3., where a partial confirmation was obtained; Component DEDICAT was found not to meet criteria set, with λ scores below a $p<.05$ significance level. For component ACHIEV a match was obtained for Higher and Lower Ranking Performer samples, with Φ and λ scores significant at $p<.05$.
- In Study 4, Chapter 5.6.2., by hypothesizing that these findings would be unrelated to cultural influences, hypothesis *H2B*, Chapter 5.4.3., with confirming evidence obtained at three different locations world-wide: in Malaysia, South-Africa and the USA; A near complete match was obtained between component DEDICAT and a complete match between component ACHIEV and components that emerged from the PCA in all three samples. λ scores were significant at a $p<.05$ significance level, Φ scores at a $p<.001$.
- In Study 5, Chapter 5.6.3., by hypothesizing that these findings would be unrelated to company-related influences, hypothesis *H2C*, Chapter 5.4.3., with confirming evidence obtained in companies differentiated according to company-type, company-profile and company-market position. As in previous samples, the Company-related Data samples provided a near perfect match between component DEDICAT as emerged from the Core Data sample and components that emerged from the PCA in all samples. Φ scores were significant at $p<.001$, λ scores nearly all at a $p<.05$. Component ACHIEV produced largely comparable results.

Study 6, Chapter 5.7.1. was aimed at defining a suitable course of action in generating factor scores to provide a means for an adequate measurement of the highly subjective construct.

In conclusion, with hypotheses *H1A* and *H1B* confirmed, and substantial evidence supporting hypotheses *H2A, H2B* and *H2C*, following the statements made in Chapter 5.4.3., it was found that both components DEDICAT and ACHIEV could be designated as the essential constructs in capturing the Process of Motivation.

Following the Problem Statement defined in Chapter 2.5. the empirical research provided evidence, then, that components DEDICAT and ACHIEV as obtained from the analysis, were indicative of Phases 3 and 8 of the Process of Motivation, and were the elementary constructs that capture the Process of Motivation, thus providing first empirical evidence in support of the Model of Motivation.

10.3. Conditions Initiating the Process of Motivation

Referring to the Problem Statement, Chapter 2.5., from these insights on the Process of Motivation, the dissertation was to unveil elementary processes involved in addressing Motivation, by subsequently providing insights in the Process of Interference.

Providing insights in the Process of Interference was to consist of: first, insights into Conditions necessary for effects to occur within the Process of Motivation, by means of a theoretical Model and empirical research.

In the theoretical Model, presented Chapter 6.2.2., four Conditions were assumed to be essential in addressing Motivation:

- Perceived Significance of the Goal, or objective
- Perceived Significance of the Actor-Intervener
- Perceived Support
- Perceived (Mis)-Match in Mutual Perceptions

Four Conditions are needed to initiate optimal Interference in the Process of Motivation:

- *Perceived Significance of the Goal, or objective*
- *Perceived Significance of the Actor-Intervener*
- *Perceived Support*
- *Perceived (Mis)-Match in Mutual Perceptions*

Following the Problem Statement, Chapter 2.5., an empirical research was to provide evidence of the relation between the isolated constructs operationalizing the Process of Motivation and concepts presumed to be indicative of these four Conditions. Following observations made in Chapter 6.2.3., critical elements associated with the theoretical Model were captured in hypotheses provided Chapter 6.4.3.

The empirical research in Chapter 6.5. was performed in three consecutive stages.

In Study 7, Chapter 6.5.1. an exploratory research was performed, aimed at providing an Inventory of all aspects, or so-called 'Elements', that could possibly affect an

Intervention in the Process of Motivation. Panel-interviews with students, university lecturers, business consultants and managers, complemented by questionnaires and findings from literature, produced an Inventory containing 482 Elements. From the Inventory a questionnaire was designed consisting of 147 questions and 22 accompanying questions, covering an abbreviated set of 380 Elements, to be used in two subsequent Studies aimed at a validation of Conditions.

It was assumed that a number of those Elements would be active in instigating Motivation, thus would display a relation with constructs DEDICAT and ACHIEV obtained from Chapter 5, capturing the Process of Motivation. In Study 8, Chapter 6.5.2. a confirmation could be found for these assumptions, as formulated in hypothesis *H1*, Chapter 6.4.3., where 52 Elements were found to be correlated with factor scores associated either to components DEDICAT or ACHIEV, or both, in a bivariate analysis performed using a standard Pearson product-moment correlation, using a $\pm$ *.300* criterion. All correlates >*-.300* were significant at the *.001* level, *two-tailed*. 41 Elements had correlates ranging between *-.300* and *-.400*, with 11 Elements correlates exceeding *-.400*. Furthermore, as was observed in the Model of Motivation, notably Chapter 3.3.2. and Chapter 6.4.3., it was assumed that a difference would occur in the extent at which both components were found to be affected by those Elements, where a considerable higher proportion of Elements were expected to display a correlation with component DEDICAT, than with component ACHIEV. A confirmation was found for these assumptions, formulated in hypothesis *H2*, defined Chapter 6.4.3, with an observation, however, that no correlations emerged exceeding the $\pm$ .300 criterion for a valid indication in defining a relationship with component ACHIEV. Pearson product-moment correlations with component ACHIEV were much less pronounced with only 17 Elements emerging with correlates ranging from -.118 to -.240. As such, it appeared from the analysis that, although relations did appear to exist, no Elements, operationalized in the questionnaire obtained from Study 7, revealed a relation that met the $\pm$ *.300* criterion with items assumed to represent Phase 3 of the Process of Motivation.

As these Elements displayed a correlation with constructs capturing Motivation (i.e. component DEDICAT), it was assumed these Elements were to be related to aspects of Motivation. Where Motivation within the observed setting was assumed to be initiated by one or more of the four Conditions obtained from the inductive inference, it was assumed that a vast majority of these Elements had to be related directly or indirectly to one or more of these four Conditions. A verification of these findings was obtained in Study 9, Chapter 6.5.3., confirming hypothesis *H3A,* defined Chapter 6.4.3., where, from Elements displaying a correlation with component DEDICAT, 7 independent observers categorized 44 from the 52 Elements as related to the assumed Conditions. Thus, a vast majority of 84.6% appeared to be directly or indirectly related to one or more Conditions, hence could be explained in terms of enabling properties associated to one or more of these Conditions. However, the data failed to provide a confirmation for hypothesis *H3B,* Chapter 6.4.3., aimed at correlations with ACHIEV, due to a lack of substantial items correlating with the construct as found in Study 8.

In conclusion, with hypotheses *H1* and *H2* confirmed, and substantial evidence supporting hypothesis *H3A*, following the statements made in Chapter 6.4.3., it was found

that correlational evidence was obtained for the assumed relation.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided exploratory and descriptive correlational evidence for a relation between constructs capturing Motivation and Conditions enabling an adequate Intervention within the Process of Motivation.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these Conditions were derived.

10.4. Competencies Enabling Conditions

Referring to the Problem Statement, Chapter 2.5., from insights on the Process of Motivation, the dissertation was to unveil elementary processes involved in addressing Motivation, by providing insights in the Process of Interference.

Providing insights in the Process of Interference was to consist of: secondly, insights in Competencies initiating the Conditions to come into effect, by means of a theoretical Model and empirical research.

The theoretical Model on Competencies was presented Chapter 7.2.

Conditions initiating the Process of Interference were identified by reducing, through a number of Assumptions, the vast universe of possible options in which the Process of Interference could be expressed, to an 8x8 matrix of possible Intervention Strategies. Within this matrix, a recurrent pattern and algorithm was observed, that revealed the 8x8 Intervention Strategies, which conceptualized the Process of Interference in its variety of manifestations, could be divided into two antagonistic approaches. These two basic approaches in addressing, or 'Management' of Motivation were defined as two principal 'Modalities': an 'Extrinsic Modality' and an 'Intrinsic Modality' in Management of Motivation, both consisting of four distinct levels of Intervention.

From both sets of four Intervention levels, a single level was observed, that was assumed to provide the most favorable scenario within each Modality for addressing the Process of Motivation.

Thus, two optimal Modalities emerged in Management of Motivation:

- An Extrinsic Modality in Management of Motivation, providing substantial opportunities for Control, at the expense, however, of Productivity. From four levels of Intervention, the Intervention Strategy addressing both a Phase of Expectancies and a Phase of Internally Evoked Self-Assessment (level 4) appeared to yield highest effects.

There are two Modalities in Management of Motivation:

- *An Extrinsic Modality, providing substantial opportunities for Control, at the expense, however, of Productivity*
- *An Intrinsic Modality, leading to high Productivity, at the expense, however, of limited opportunities for Control*

- An Intrinsic Modality in Management of Motivation, leading to high Productivity, at the expense, however, of only limited opportunities to apply Control. From four levels of Intervention, the Intervention Strategy that withholds addressing any Phase (level 8) appeared to yield highest results

From the analysis two distinct sets of Competencies emerged:

- For an optimal Extrinsic Modality in Management of Motivation:
  - A single Extrinsic Attitudinal Competency, defined as: Dignity
  - Four Extrinsic Technical Competencies, defined as:
    - A Technical Competency of Providing Extrinsic Preconditions,
    - A Technical Competency of Clarifying Extrinsic Outcomes,
    - A Technical Competency of Providing Active Assistance,
    - A Technical Competency of Providing Active Feedback.

An optimal Extrinsic Modality in Management of Motivation consists of:

- *An Attitudinal Competency: defined as Dignity*
- *Four Technical Competencies, defined as:*
  - *A Technical Competency of Providing Extrinsic Preconditions,*
  - *A Technical Competency of Clarifying Extrinsic Outcomes,*
  - *A Technical Competency of Providing Active Assistance,*
  - *A Technical Competency of Providing Active Feedback.*

- For an optimal Intrinsic Modality in Management of Motivation:
  - Three Intrinsic Attitudinal Competencies: Respect, Dignity, Trust
  - Four Intrinsic Technical Competencies, defined as:
    - A Technical Competency of Clarifying Intrinsic Preconditions,
    - A Technical Competency of Clarifying Intrinsic Outcomes,
    - A Technical Competency of Providing Passive Assistance,
    - A Technical Competency of Providing Passive Feedback.

An optimal Intrinsic Modality in Management of Motivation consists of:

- *Three Attitudinal Competencies, defined as: Respect, Dignity, Trust*
- *Four Technical Competencies, defined as:*
  - *A Technical Competency of Clarifying Intrinsic Preconditions,*
  - *A Technical Competency of Clarifying Intrinsic Outcomes,*
  - *A Technical Competency of Providing Passive Assistance,*
  - *A Technical Competency of Providing Passive Feedback.*

Following the Problem Statement, Chapter 2.5., an empirical research was to provide evidence of the relation between concepts presumed to be indicative of Conditions and concepts operationalizing these various Competencies. Following observations made in Chapter 7.2.3., critical elements associated with the theoretical Model were captured in hypotheses provided Chapter 7.4.3.

The empirical research in Chapter 7.5. was performed in two stages:

Two Conditions were assumed could be targeted by Competencies, defined as Perceived Support and Perceived (Mis)-Match in Mutual Perceptions. Both targeted Conditions were operationalized in a single concept, in order to avoid co-variation and conceptual overlap. First Preliminary Analyses in Study 10, Chapter 7.5.1., were aimed at a verification of this single concept:

- First of its presumed suitability capturing the distinct Conditions. The analysis confirmed the proposed single concept to be an adequate representation of both targeted Conditions. A regression analysis was performed to assess the relationship between a variable CAPTURED_CONDITIONS as dependent or response variable, and both Conditions PERCEIVED_SUPPORT *(R^2=.558, F(2,156)=98.35, p<.001),* and PERCEIVED_MATCH separately *(R^2=.071, F(2,150)=5.77, p<.01)*, each with their distinct explanatory variables, with reference to Table 7.2.
- Second, of the relation between the single concept and Motivation as expressed in factor scores, following the analysis in Chapter 5. A simple regression was performed with a standard Pearson product-moment correlation to assess the relationship between variable CAPTURED_CONDITIONS and both factor scores DEDICAT and ACHIEV capturing Motivation. In the analysis a distinction was made between both factor scores. An assumed relation could be established with factor score DEDICAT *(R^2=.099, F(1,158)=17.30, p<.001),* however in regressing the concept variable CAPTURED_CONDITIONS onto factor score ACHIEV, no relation seemed apparent *(R^2=.012, F(1,158)=1.97, p=.163),* with reference to Table 7.3., with notice that this finding was in line with assumptions made in Chapter 7.4.3.

Following the criteria defined in Chapter 7.4.3., on suitability of the single concept as an intermediate variable, the analysis assumed both inherent relations could be established.

Thus, in Study 11 Chapter 7.5.2., a subsequent analysis could be made to provide evidence for a relation to exist between the single concept that was to represent the occurrence of a successful Intervention and more specific concepts operationalizing Attitudinal and Technical Competencies, in both Extrinsic and Intrinsic Modalities. The data-set consisted of three sets obtained at three locations within a single Company, with sample size *n=550.* Multiple regression analysis was performed and from the data a confirmation could be obtained for four prominent hypotheses defined in Chapter 7.4.3., in verifying the relations between Conditions assumed to be targeted and the various Competencies:

In Extrinsic Management of Motivation:

- Confirmation was obtained for hypothesis *H1A,* defined Chapter 7.4.3., where it was assumed that the Extrinsic Attitudinal Competency was significantly related to the single concept capturing targeted Conditions. *(R^2=.580, F(2,527)=363.73, p<.001).* Referring to Table 7.5., where results are provided of the regression analysis of the single variable CAPTURED_CONDITIONS on the single Extrinsic Attitudinal Competency, previously mentioned.

- Confirmation was obtained for hypothesis *H1B,* defined Chapter 7.4.3., suggesting that Extrinsic Technical Competencies were indeed significantly related to the single concept capturing the targeted Conditions *(R^2=.726, F(8,496)=164.00, p<.001).* Referring to Table 7.6. for an overview of the regression analysis of the single variable CAPTURED_CONDITIONS on the four Extrinsic Technical Competencies, previously mentioned, with a stepwise hierarchical procedure including successive Competencies.
  Within the Extrinsic Modality, a Technical Competency of Clarifying Extrinsic Outcomes, accounted for most of total variance *(ΔR^2=.469, p<.001,* as detailed in Table 7.6.). When Attitudinal and Technical Competencies were combined, significance of individual parameters dropped, suggesting an overlap in the total proportion of variance accounted for.

In Intrinsic Management of Motivation:

- Confirmation was obtained for hypothesis *H2A,* defined Chapter 7.4.3., assuming that Intrinsic Attitudinal Competencies were significantly related to the concept capturing both targeted Conditions *(R^2=.592, F(4,522)=189.75, p<.001).* Reference is made to Table 7.8., where results are summarized of the regression analysis of the single variable CAPTURED_CONDITIONS on Intrinsic Attitudinal Competencies, including a stepwise hierarchical procedure over successive Competencies. In the analysis the three Intrinsic Attitudinal Competencies, previously mentioned, were considered as independent variables.
- Confirmation was found for hypothesis *H2B,* defined Chapter 7.4.3., with the assumption that Intrinsic Technical Competencies were significantly related to the single concept in enabling the Conditions favorable to induce Intervention in the Process of Motivation. All parameters contributed significantly to explaining the outcome, where the model provided a significant fit of the data overall, with *R^2=.653, F(7,520)=139.83, p<.001.* Reference is made to Table 7.9. for a comprehensive overview of the regression analysis of the single variable CAPTURED_CONDITIONS on Intrinsic Technical Competencies including a stepwise hierarchical procedure on successive Competencies. The gradual inclusion of parameters associated to the four Competencies, resulted in a successively significant contribution of the distinct explanatory variables, with at least one variable operationalizing each Competency providing a significant contribution to predicting, or explaining, the outcome variable. In the analysis the four Intrinsic Technical Competencies, previously mentioned, were used as independent variables.
  In contrast with Extrinsic Technical Competencies, within the Intrinsic Modality, a Technical Competency of Clarifying Intrinsic Preconditions, was most prominent in contributing to total variance *(ΔR^2=.606, p<.001,* as deduced from Table 7.9.). As a general observation, when Attitudinal and Technical Competencies were combined, significance of individual parameters dropped, as in the Extrinsic setting, suggesting overlapping proportions of variance accounted for.

In conclusion, then, with hypotheses *H1A, H1B* and *H2A, H2B* confirmed, and following the statements made in Chapter 7.4.3., it was found that substantial evidence was obtained for establishing the assumed relations.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research provided evidence for establishing a relation between concepts presumed to be indicative of Conditions enabling Motivation and concepts operationalizing these Competencies.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these Competencies were derived.

10.5. Instruments Providing the Means for Competencies to Occur

Referring to the Problem Statement, Chapter 2.5., from insights on the Process of Motivation, the dissertation was to unveil elementary processes involved in addressing Motivation, by providing insights in the Process of Interference.

Providing insights in the Process of Interference was to consist of: thirdly, insights in exemplary Instruments that provide the means for these Competencies to occur, through a theoretical Model and empirical research.

The theoretical Model on the Instruments was presented Chapter 8.2.2., where following Instruments emerged:

- An Intrinsic Attitudinal Instrument: a training setting provided for the Actor-Intervener, used as a principal vehicle aimed mainly at facilitating Intrinsic Attitudinal Competencies,
- An Intrinsic Technical Instrument: a structured interview provided to the Actor-Intervener aimed mainly at facilitating Intrinsic Technical Competencies.

Following the Problem Statement, Chapter 2.5., an empirical research was to provide evidence for a causal relation to exist between the isolated constructs operationalizing the Process of Motivation and concepts operationalizing these Instruments. Following observations made in Chapter 8.2.3., critical elements associated with the theoretical Model were captured in hypotheses provided Chapter 8.4.3.

An optimal research design was defined based on criteria of internal, external, construct and statistical validity.

The empirical research in Chapter 8.5. was performed in three separate Studies, from which one Study was presented in detail and two Studies in summarized format, referring to the original research Project detailed in Mennes (2016, *in press*).

Thus, a brief synopsis was provided of Study 12, Chapter 8.5.1.

Study 13, Chapter 8.5.2., consisted of a Comparative Analysis Independent Measures to provide evidence for the assumed causal relation between an application of Instruments and a successful addressing of the Process of Motivation. Study 13 provided a Diversification in Treatment Groups assessing the effects of a single, a two-fold, a three-fold and a four-fold, or higher, exposure to the treatment condition. An analysis of variance was performed and from the data a renewed confirmation could be obtained for the hypotheses formulated earlier in Study 12, capturing the essence of the assumption for a cause-and-effect relation. A confirmation was found for hypothesis *H1D,* formulated Chapter 8.4.3., where is was assumed that addressing the Process of Motivation by means of a four-fold, or higher, exposure to the Instruments would lead to a significantly higher Motivation within the Experimental Group as compared to Control Groups that would have had no exposure.

The Comparative Analysis in Study 13 was performed in three phases:

- In an introductory One-way independent ANOVA, testing a principal Experimental Group versus Control Group in both pretest and posttest settings, there was a significant effect of the treatment condition on Motivation as captured by factor score component DEDICAT, $F(1, 59)=5.97, p<.05, \eta^2=.092,$ on the posttest condition, as compared to $F(1, 70)=0.07, p=.79, \eta^2=.001,$ on the pretest condition.
- Subsequently, a Planned-Comparison for One-way independent ANOVA was performed, allowing for an analysis with Diversification in Treatment Groups. The Planned-Comparison was performed to assess effects of treatment in following analyses:
  - A Planned-Comparison for the combined Experimental Groups versus the Control Group, revealed a significant difference for the Experimental Groups after treatment, with $t(165)=2.14, p<.05$ *(two-tailed),* $\eta^2=.037,$ as captured by factor score component DEDICAT, whereas no significant differences appeared in the pretest setting, with $t(175)=-.16, p=.87$ *(two-tailed),* $\eta^2=.003.$
  - A Planned-Comparison for the separate Experimental Groups versus a Control Group, revealed a gradual effect on Motivation. Planned-Comparisons between the various Experimental Groups and the Control Group in the posttest setting obtained following results, with $t(165)=-1.60, p=.11$ *(two-tailed),* $\eta^2=.037$ for a single exposure to treatment, with $t(165)=-1.68, p=.10$ *(two-tailed),* $\eta^2=.037$ for a two-fold exposure, with $t(165)=-.82, p=.42$ *(two-tailed),* $\eta^2=.037$ for a three-fold exposure, and with $t(165)=-2.35, p<.05$ *(two-tailed),* $\eta^2=.037$ for a four-fold, or higher, exposure to treatment respectively, as opposed to non-significant results in the Planned Comparison in the pretest condition, with respective outcomes for the different comparisons $t(175)=.23, p=.82$ *(two-tailed),* $\eta^2=.003,$ $t(175)=-.31, p=.75$ *(two-tailed),* $\eta^2=.003,$ $t(175)=.34, p=.73$ *(two-tailed),* $\eta^2=.003,$ and $t(175)=.25, p=.80$ *(two-tailed),* $\eta^2=.003.$

- Given the sequential order in which the Treatment Groups could be observed, a Trend-analysis using polynomial contrasts was provided, restricted to a basic linear trend in the value of the dependent variable across the four Treatment categories. A significant linear trend could be observed, F_{LIN} *(1,165)=4.19, p<.05,* η^2*=.037,* as opposed to F_{LIN} *(1,175)=0.07, p=.79,* η^2*=.003* on pretest, indicating that as the treatment condition and exposure to the Instruments increased, Motivation, as captured by factor score component DEDICAT, increased proportionally.

- Finally, in a third and final phase of the Comparative Analysis, a Two-way independent factorial ANOVA was performed, evaluating the interaction of pre- and posttest variables and the effects of these interactions on the observed factor score component DEDICAT, capturing Motivation. A non-significant effect for the model in general was obtained, with *F(3, 346)=1.95, p=.12,* η^2*=.017*, indicating that exposure to treatment per se, was not a sufficient condition for an increased Motivation to occur. In observing the effects of more frequent exposures, significant results emerged in the factorial ANOVA of Experimental Groups with at least a four-fold exposure, where a significant effect for the model in general was obtained, with *F(3, 129)=2.69, p<.05,* η^2*=.059.* Relevant to the analysis of pretest and posttest related effects between Treatment Group and non-Treatment Group, was a significant interaction effect observed between Experimental and Control Groups on pretest and posttest Time-of-Measure in the level of Motivation, *F(1, 129)=4.62, p<.05,* η^2*=.035.*

Again, no significant results were obtained in the various analyses for factor scores associated with component ACHIEV on pretest and posttest conditions.

In conclusion, with hypothesis *H1D* confirmed in Study 13, following the statements made in Chapter 8.4.3., it was found that evidence was provided for a causal relation assumed to exist between an application of Instruments and a successful Intervention within the Process of Motivation.

Following the Problem Statement defined in Chapter 2.5., then, the empirical research produced evidence for a causal relation to exist between isolated constructs operationalizing the Process of Motivation and concepts operationalizing the exemplary Instrumentation.

In addition, these findings provided secondary empirical evidence in support of the Model of Motivation, from which these exemplary Instruments were derived.

10.6. *Conclusions*

In conclusion, then, it appears insights have been obtained as called for in the Problem Statement, defined Chapter 2.5., into the Process of Motivation and into elementary processes involved in addressing Motivation through a Process of Interference.

The study appears to provide evidence:

- *that the Process of Motivation, as represented by a Model obtained in an inductive inference and supported by findings from literature, produced through empirical research the elementary constructs from the Model, capturing Motivation, which transformed the complex concept into a measurable entity;*
- *that based on the Model of Motivation, Determinants from the Process of Interference could be derived:*
  - *Four Conditions, supported by results obtained from empirical research, that enabled an adequate addressing of the Process of Motivation;*
  - *Attitudinal and Technical Competencies, specifically defined within two Modalities in Management of Motivation, an Extrinsic Modality and an Intrinsic Modality, supported by findings from empirical research;*
  - *And, within an Intrinsic Modality, an exemplary Instrument that produced a significant effect in Management of Motivation.*

  Research into these Determinants provided secondary empirical evidence in support of the Model of Motivation, from which these Determinants were derived.

It was concluded, then, in Chapter 9, reflecting on the Problem Statement, that the objectives of this dissertation have been reached.

10.7. *Implications*

With these results adding to the robustness of the explanatory theoretical Model of the Process of Motivation and its derived Process of Interference, a number of Implications ex post inferred from the theoretical Model are to be presented, in accordance to observations made in Chapter 1.5.

In a final and closing Chapter, that is to follow the main Summary of this dissertation, these Implications of the study for a Theatro Motivarum are to expand in further thoughts provided in an Epilogue.

In referring to the Prologue preceding the dissertation, both concluding Chapters, Implications and Epilogue, are considered to be this study's legacy.

A leaders is best
When people barely know that he exists,
Not so good when people obey and acclaim him,
Worst when they despise him (...).
But of a good leader, who talks little,
When his work is done, his aim fulfilled,
They will all say, 'We did this ourselves'.

Lao Tzu, Tao Te Ching, verse 17
(Bynner, 1994)

I always remember the regent's axiom:
a leader, he said, is like a shepherd.
He stays behind the flock, letting the most nimble go on ahead,
whereupon the others follow,
not realizing that all along they are being directed from behind.

Nelson Mandela, Long Walk to Freedom
(1994, reprint 2013, p. 25-26)

Chapter 11
De Theatro Motivarum
Implications

The Process of Motivation, analyzed and represented by a Model, produced corresponding constructs capturing Motivation, which, in turn, enabled to analyze and describe a Process of Interference, and to define optimal Conditions and Competencies to address Motivation through design of an Instrument within an Intrinsic Modality.

Following a presentation of the final conclusions in Chapter 9, this study was to expand beyond results for which empirical evidence was obtained, in an overview of so-called 'Implications', as proposed in the Pre-Fundamentals at the start of the dissertation. In Chapter 1.5., provisions were made for an 'ex post' inductive inference following the traditional deductive testing on which the final conclusions were based.

Where Fundamental Assumptions initially served to reduce a complex interaction, this reduction, both in its representation of Motivation, and in its representation of Interference, appeared to provide an adequate basis leading to significant results, as

summarized in these conclusions.

Following observations made in Chapter 1.5., from the conclusions made in this study, then, we might assume that the Process of Motivation, as represented by the Model, provides an adequate description of Motivation, and that the distinction made in the Process of Interference, in Determinants and in Extrinsic and Intrinsic Modalities provides an adequate framework for a successful approach to Management of Motivation.

If these assumptions hold true, Implications are many.

In a final and closing Chapter of this study, an overview is provided of Implications of the study for a Theatro Motivarum. The speculative nature of these Implications is reflected in a series of inspired headings given to the Chapters covering the four main fields of interest[1]. These four Chapters, expanding with further thoughts into the Epilogue, are to be this study's legacy.

May they serve to inspire further research, thought and understanding in the fields of Motivation and in Management of Motivation...

11.1. *De Homine*
The Process of Motivation: Implications for the Individual

A Model of Motivation was presented and observed on properties thought to be associated to a manifestation of presumed Mechanisms. Assuming the Model provides an adequate description of the Process of Motivation, a first Implication would entail a departure from conventional theories on human Motivation.

In the study, the Process of Motivation is represented, not in terms of a uniformistic 'status quo', or a behavioral activity instigated by needs or drives, by reinforcement, cognitions, anticipations, or learning abilities, but rather as an intricate composite of all those constructs and processes.

Motivation is assumed to be a pluriform expression of a multitude of distinct Processes of Motivation, each evolving around an objective set, each objective generating its own Process of Motivation, and proceeding, as captured by the Model, through distinct Stages according to eight Phases. Some Processes of Motivation remaining at an initial Phase 1, some Processes proceeding through Phases 1, 2 and 3, others progressing through all consecutive Phases.

[1] With reference to the title of the study, 'De Homine' (literally 'about man') is a free translation referring to the Individual. Chapter 11.2., 'De Societate', refers to Society; Chapter 11.3., 'De Tractatio' ('about treatment'), to management; Chapter 11.4., 'De Principes' ('about leading men') , to Leadership.

A number of key concepts appear to regulate this intricate Process of Motivation, as represented by the Model. The Goal, or objective, can be expressed in differing degrees of importance, or 'Significance', leading to various degrees of invested Effort. And these, in turn, can lead to several strategies, deterring or avoiding effects not only on personal evaluations in Phases 1, 2 and 3, but also, and especially, regulating effects of Reality in Phases 5, 6 and 7.

These concepts and associated strategies, as expressed in various 'Mechanisms', appear to have profound Implications on how the Process of Motivation unfolds and is expressed by the Individual.

1. Significance

Assigning Significance, or importance, to the objective makes one vulnerable, both to 'internal', and to 'external' influences. Internally, as assigning Significance to the objective, provides Satisfaction when one obtains one's Goal, but comes at the expense of Frustration when one fails at the attempt. Externally, the interfering repercussions of Reality become more pronounced.

The Implication is that Significance of the objective appears to regulate to a great extent the Process of Motivation.

2. Effort

In addition, investing Effort in obtaining an objective, increases chances of Achievement, leading to Satisfaction. At the same time, however, it also increases chances of Frustration, as a consequence of a possible Failure.

The Implication is that Effort appears to regulate a balance between Satisfaction and Failure. The more Effort, the more Satisfaction, at the expense of a risk of Frustration.

3. Significance & Effort

As a consequence, the relation between Significance of the objective and Effort appears to be non-linear. The more Significant an objective the less likely it becomes that Effort is invested, as the risk of Failure becomes more manifest, and, as a consequence of Significance, becomes more pronounced in perceived feelings of Frustration. With higher Significance, a resulting Satisfaction might increase, at the risk, however, that Frustration could intensify.

As a result, the relation between both entities is likely to be curvilinear, reaching towards an optimum, and then declining towards zero[1].

4. Coping

A deterring effect is assumed to occur in Mechanisms of Coping. A confrontation with Reality leads to re-attunements in a Phase of Expectancies. Having experienced the effects of Reality, Mechanisms of Anticipation are initiated to counteract these effects[2]. In these Mechanisms of Anticipation, one turns to previous experiences, especially from a Phase of Dedication. It is assumed in the Model, that in a Phase of Dedication a Representation was made of Reality as a spin-off to feelings of support and non-support as experienced by the Individual[3]. And the objective and parameters are now re-attuned, not to the 'original' version of Reality, but in response to this Representation. A Mechanism of Representation substitutes Reality and superimposes a more convenient image. The intricate interplay of Mechanisms is subsequently consolidated in Phases 5, 6 and 7, through Mechanisms of Coping, shortly referred to as 'Coping'[4].

Coping aims at reducing Impact, or a Discrepancy between Goal and perceived Reality. Mechanisms of Coping, by transposing an image over Reality obtained through Mechanism of Representation, neutralize effects of Reality in case of a negative influence, and enhance its effects in case of a positive outcome. And in doing so, the 'integrity' of the objective is preserved, and the disrupted carefully orchestrated cocoon designed around an objective, is re-installed towards its original design.

Thus, as a further Implication, it is assumed that Coping has a preserving and protective function towards the Process of Motivation. As such, it serves a restorative and therapeutic purpose for the Individual.

5. Significance & Coping

However, it appears these effective preserving and protecting properties come at a price.

[1] These assumptions, in turn, would have pronounced Implications in the field of economic theorizing, where linearity is assumed between concepts associated with Effort and investment or expenditure, and those associated with Significance of the objective.

[2] Reference is made to Chapter 3.3.2.1. and Appendix I, Section B.2.1. and Section B.2.2.

[3] Reference is made to Chapter 3.3.2.2., Chapter 3.3.2.4., and Appendix I, Section B.2.4, Section B.2.5., Section B.2.6., Section B.2.7. and Section B.2.8.

[4] Reference is made to Chapter 3.3.2.3., and Appendix I, Section B.2.5. and B.2.6.

Significance of the objective regulates the Process of Motivation. The more important the objective, the more one tends to preserve its 'integrity'. The more protective these measures, the more likely disruptive effects will occur at the introduction of Reality. And the more disruptive a perceived Reality, the more pronounced the effects of Coping.

Thus, Significance of the objective leads to Coping. The more Significant the objective, the more likely protective measures are used to encapsulate Reality, the more Coping is likely to occur, either in a positive, enhancing direction, or in a negative, neutralizing sense.

Through consecutive cycles in the Process of Motivation, it is assumed the Individual, through Mechanisms of Coping, will come to drift further away from Reality. The more Significant the objective, the more explicit the expressions in Coping. And the more Coping, the more Reality is changed.

The Implication, in turn, of these observations, is that the more Significant one's objective, the more adrift one's perception of Reality becomes.

6. Effort & Coping

The more Coping, the more one's Effort or investment is preserved against a disruptive interference from Reality.

The observation summarizes the various inferences made in observing the Process of Interference: the more the Individual is provided an opportunity at Coping from an outside Actor-Intervener, the more productive the Individual becomes.

The observation substantiates the 'counter-intuitive' Implication for Management of Motivation: an Intrinsic Modality of Intervention, instigated through Reality, and aiming at expressions of Coping and thereby neutralizing its Impact, results in increased Productivity at the obvious expense of Control.

7. Significance, Effort & Coping: on 'Achieving Excellence'

The more Significant an objective, then, the more cautious we appear to become in investing Effort. Despite an increased chance of obtaining Success, the risk of investing Effort also brings an increased risk of Failure, leading to more pronounced feelings of Frustration. In addition, interference from Reality becomes more prominent, resulting in more pronounced effects of Coping.

Consequently, one might assume that investing Effort at the higher extremes of Significance requires exceptional courage in fighting both fear of Failure and Impact of Reality.

The Implication appears to be that only few develop strategies to persist in investing

Effort in highly Significant objectives. If achieving excellence can be considered as an act of investing Effort in highly Significant objectives, these observations could clarify why only precious few endeavor in such attempts.

If these assumptions are true, a further Implication would be an alternative definition of excellence: achieving excellence is assumed to consist of mastering adequate personal strategies to invest Effort in highly Significant objectives, resisting fear of Failure, in view of an obstructive Reality.

8. All Things Significant are Discrepant

In summary, then, Significance assigned to an objective leads to Coping. The more Significant the objective, the more likely protective measures are used to encapsulate Reality, either in a positive, enhancing direction, or in a negative, neutralizing sense. A Mechanism of Coping changes a perception of Reality and makes one perceive Reality as more Discrepant from a 'true', or manifest Reality.

It follows, that the more Significant an objective, the more pronounced these Mechanisms of Coping, and the more Discrepant Reality becomes.

As a final conclusion, then, one might infer a tendency that 'all one holds as Significant, is Discrepant from Reality'...

11.2. *De Societate*
The Process of Motivation: Implications for Society

Mechanisms of Coping, then, are a 'natural' reaction to deal with Reality when it seems to interfere with an objective we perceive as Significant. It aims at reducing the Impact, or Discrepancy between Goal and perceived Reality. As such, it appears to have a preserving, restorative and even therapeutic purpose for the Individual.

It appears that in interaction with others, we seek confirmation for these attempts at dealing with an interfering Reality. We share Mechanisms of Coping. This sharing of a primarily 'inner dialogue' aimed at reducing a highly personal perception of Reality in relation to a highly personal Significant objective, is likely to produce a vast array of miscommunications.

However, in one instance of seeking confirmation in attempts at neutralizing interference from Reality through Coping, an interpersonal expression of Coping appears to be highly effective. When one shares a common Goal, with a comparable degree of perceived Significance, the expression of Coping is likely to be recognized and confirmed as pursuing a same intention towards neutralizing interference from Reality. In the expression of Coping, one shares a same strategy. And a reciprocal confirmation re-affirms the mutual expression of Coping, which further intensifies the interpersonal recognition.

If these reciprocal expressions, with a common origin in shared Significance of the objective and in shared perceptions of an interfering Reality, are 'channeled' through media in larger groups with equivalent views, a collectively shared expression of Coping could emerge, which, in turn, serves to further unify and strengthen communal relations.

The occurrence of so-called 'Mechanisms of Collective Coping', shortly referred to as 'Collective Coping', serve to neutralize a shared perception by a group of an interfering Reality, which is obstructing a shared Significant objective to express itself.

Collective Coping is a self-propelling communal Mechanism to preserve the integrity of a highly valued common Goal. In its expression, two tendencies occur with further important Implications.

In an Implication of findings, Collective Coping is defined as a self-propelling communal Mechanism to preserve the integrity of a highly valued common Goal by neutralizing Interference from an obstructing Reality.

Where Significance of one's objective and perception of Reality are seldom communicated, Coping tends to be the foremost expression in communication. A first Implication of this tendency would be that in large area's of interpersonal communication, where Collective Coping is expressed, one seeks to obtain support without sharing its 'origins', in terms of Significance in objective and perceptions of Reality. As a consequence, communication occurs around neutralizing Mechanisms. One is not conveying content, but rather seeking confirmation. Further miscommunication occurs when Collective Coping is manifested, pretending to be content-oriented. Public discussion and debate appear to be frequent expressions of this tendency.

A second Implication is a direct result of the inherent function of Coping: it aims at changing perceived Reality in a direction that sustains one's Significant objective. The more Significant the objective, the more explicit the expressions of Coping. And the more Coping, the more Reality is changed. The Implication for Mechanisms of Collective Coping is that in shared expressions aimed at neutralizing a common perception of Reality, people collectively alienate themselves from Reality. The more Significant the issue, the more adrift a collective perception of Reality becomes. And the less opportunities emerge for reaching adequate and lasting solutions.

11.3. *De Tractatio*
The Process of Interference: Implications for Management of Motivation

The insights obtained on the Process of Motivation produced an adequate framework for Management of Motivation, of which empirical research provided first findings in support of the assumptions made.

If we are to assume these findings can be generalized to a comprehensive approach in addressing Motivation, this could imply that the distinction made in Extrinsic and Intrinsic Modalities provides an adequate framework for a successful approach to Management of Motivation.

Within both Modalities, two distinct approaches were thought to be best in Management of Motivation: one approach among four alternatives within the Extrinsic Modality, and one approach from four within the Intrinsic Modality.

The major distinction differentiating an Extrinsic Approach to Management of Motivation from an Intrinsic Approach, lies in the aim to control the objective of an Individual by an external agency, or 'Actor-Intervener'. As such, one acquires Control at the expense, however, of Productivity. The Individual refines the Goal to accommodate an external Actor-Intervener, which manifests itself through Reality. The more an external objective is imposed, the more 'foreign' the parameters become, the less Effort, in terms of Productivity is likely to be produced. And, as stated earlier, Significance of the objective, Effort and Coping profoundly regulate these processes[1].

The major distinction, then, differentiating an Intrinsic Approach to Management of Motivation, from an Extrinsic Approach, is in the absence of Control in defining the objective of an Individual by an Actor-Intervener. One acquires Productivity at the expense, however, of regulation through Control. The Individual defines the Goal and has full power in defining Significance, Effort and Coping. As such, the integrity of the objective is optimally maintained, resulting, within personal limitations imposed by Mechanisms of Coping, in an optimal Effort, hence Productivity. Opportunities to externally Control these processes, however, are dramatically reduced. Referring to Implications made earlier, the effects of Significance of the objective, Effort and Coping are amplified, at the expense of outside interference.

However, these assumptions are not meant to categorize management techniques or a personal management style as being either Extrinsic or Intrinsic in its Approach to Management of Motivation. Rather, management techniques are to alternate between both Approaches in addressing the Individual. Thus, in Management of Motivation multiple transitions per Individual per objective are to become prevalent, rather than a current practice of uniformity in predominantly Extrinsic techniques.

11.4. *De Principes*
The Process of Interference: Implications for Leadership

If these assumptions hold true, Management of Motivation, then, consists of two opposed Modalities: the Extrinsic Modality enabling Control at the expense of Productivity, and an Intrinsic Modality propelling Productivity, at the expense of external Control.

From these observations on Management of Motivation, an approach to leadership emerges, with repercussions on classification in traditional leadership-styles.

Current leadership theories emphasize the role of context, or situation, in the

[1] Reference is made to Chapter 7.2.1. and Appendix XXIV, Section B.2., notably Section B.2.7.

expression of specific attributes needed, and only seldom is Motivation identified as a core competency (Latham, 2007). A 'single state' approach in leadership, be it 'directive', or 'non-directive', 'process-' or 'people-'oriented, suggests that in a multitude of activities a single approach prevails. If the assumptions that are made on an adequate Management of Motivation hold true, the approach does not do justice to the complexity of situations in which a leader is to operate. In terms of Control, effects appear to be adequate; in terms of Productivity, however and following our observations, they might appear to be superficial. Leadership is not so much dependent on context, or situation, (or, as it often does, solely on preferred leadership style), but rather on continuous alterations between control and productivity, between prevalence on leadership-oriented decision, or on member-oriented potential, as instigated by context, or situation.

Thus, leadership is to evolve and progress into a style, that is not solely depending on context, or situation, but rather on leader-instigated prevalence on either Control or Productivity by multiple, dynamic transitions between Extrinsic and Intrinsic Modalities instigated by context, or situation, and dependent on directive needs of the leader, or potential resources of the member.

In leadership, then, the interaction prevails. And depending on context, or situation, leadership continuously envisions which actor in the interaction gets preference. In an Intrinsic Modality, Control recedes and the needs of the member, or employee are addressed to their full potential, generating an optimal Productivity. In an Extrinsic Modality, Control expands and the needs of the leader prevail, thereby restraining Productivity.

Thus, leadership is oriented towards the needs of the actors within the interaction: it is an 'Interactional Leadership'.

Interactional Leadership is a leadership style that is guided primarily by the needs of its actors, where either leader-oriented Control, or member-oriented potential prevails, depending on context, or situational circumstances. Interactional Leadership is characterized by a pluriform approach with multiple, dynamic changes between Extrinsic and Intrinsic Modalities.

Within the Intrinsic Modality, a further diversification can be made into an Interpersonal Approach and an Intrapersonal Approach.

The Interpersonal Interactional Leadership Approach aims at initiating a dialogue between leader and members based on the Intrinsic Attitudinal and Technical Competencies introduced in the study.

The Intrapersonal Interactional Leadership Approach manifests itself on rare occasions in an expression of leadership using equivalent Intrinsic Determinants inducing Motivation. Only in an Intrinsic Technical Competency of Providing Passive Assistance, a leader approaches an interfering Reality differently by expressing an alternative Coping strategy. Instead of assisting a member in Coping, the leader presents an alternative voice by modeling Coping, which is left to the member to either follow, or reject.

11.5. *De Theatro Motivarum* Summary of Principal Implications

As proposed in the Pre-Fundamentals at the start of the dissertation in Chapter 1.5., this study was to expand beyond results for which empirical evidence was obtained, in an overview of so-called 'Implications'.

In a final and closing Chapter of this study, an overview is provided of Implications of the study for a Theatro Motivarum. These Implications are considered to be this study's legacy.

From the conclusions made in this study, it was assumed the Process of Motivation, as represented by the Model, provided an adequate description of Motivation, and that the distinction made in the Process of Interference, in Extrinsic and Intrinsic Modalities provided an adequate framework for a successful approach to Management of Motivation.

In the study, the Process of Motivation, as represented by the Model of Motivation, was assumed to be an 'inner dialogue' initiated by the Individual, largely regulated by subconscious Mechanisms, where an attempt was made to reach and secure an objective set, and to limit the effects of outside interferences. It was assumed that every Process of Motivation evolved around an objective, and progressed in a number of distinct, consecutive Stages, that were organized in Phases. Significance attached to the objective set, the Effort invested and Mechanisms of Coping aimed at addressing interference from Reality, together regulated this intricate Process towards attaining the objective.

A Mechanism of Coping was assumed to be a 'natural' reaction to deal with Reality when interfering with an objective that was perceived as Significant. As such, it had a preserving, restorative and even therapeutic purpose for the Individual.

It appeared that in interaction with others, the Individual was seeking confirmation for these attempts at dealing with an interfering Reality. When one shared a common Goal, with a comparable degree of perceived Significance, the expression of Coping was likely to be recognized and confirmed as pursuing a same intention towards neutralizing interference from Reality. If these reciprocal expressions were to be 'channeled' in larger groups with equivalent views, a collectively shared expression of Coping was likely to emerge, which in turn, served to further unify and strengthen communal relations. The occurrence of so-called 'Mechanisms of Collective Coping' served to neutralize a shared perception by a group of an interfering Reality, which was obstructing a shared objective to express itself. Thus, Collective Coping appeared to be a self-propelling communal Mechanism to preserve the integrity of a highly valued common Goal.

Furthermore, in Management of Motivation, the study identified two main approaches: an Extrinsic Modality enabling Control at the expense of Productivity, and an Intrinsic Modality propelling Productivity, at the expense of Control, where management techniques were to alternate between both Approaches in addressing the Individual.

From these observations on Management of Motivation an approach to leadership emerged, with repercussions on classification in traditional leadership-styles.

Interactional Leadership was defined as a leadership style that was guided primarily by the needs of its actors, where either leader-oriented Control, or member-oriented potential prevailed, depending on context, or situational circumstances. Interactional Leadership was characterized by a pluriform approach with multiple, dynamic changes between Extrinsic and Intrinsic Modalities. Within the Intrinsic Modality, a further diversification was made in an Intrinsic Interpersonal Interactional Leadership Approach and an Intrinsic Intrapersonal Interactional Leadership Approach. The Intrinsic Interpersonal Approach aimed at initiating a dialogue between leader and members based on the Intrinsic Attitudinal and Technical Competencies introduced in the study. The Intrinsic Intrapersonal Approach manifested itself on rare occasions, in an expression of leadership modeling alternative Coping strategies.

[11]And He said, "Go forth, and stand upon the mount before the Lord."
And behold, the Lord passed by,
and a great and strong wind rent the mountains
and broke in pieces the rocks before the Lord,
but the Lord was not in the wind;

and after the wind an earthquake,
but the Lord was not in the earthquake.

[12]And after the earthquake a fire,
but the Lord was not in the fire.

And after the fire, there was the sound of a gentle whisper.

[13]As soon as Elijah heard it, he covered his face in his mantle,
went outside, and stood at the entrance to the cave.

1 Kings, 19: 11-13
(21st century King James Version)
(International Standard Version)

Epilogue

In activities man sets about, a purpose, an intention, an act of will can be seen. These intentional acts appear to have a common origin in the will of man to intervene in his destiny and his surroundings.

Knowledge from decades of theory and research in this field of human Motivation appeared to have brought us surprisingly little insights to have the human condition thrive and prosper in a better world, and have us prevent a reoccurrence of human suffering in war, discrimination, genocide, poverty and excessive injustice.

From a perspective that these acts or expressions are routed in human Motivation, this study aimed at initiating further thought and understanding, where inductive inference was to generate a Model, embedded in findings from literature, producing hypotheses that were to be verified with traditional empirical research.

The field of human Motivation was represented using a dichotomy, describing a Process of Motivation distinct from a Process of Interference.

In observing the Process of Motivation, evidence could be obtained of concepts capturing Motivation, derived from a Model describing Motivation as a sequential, cyclical, 'inner dialogue'. This led to the assumption that two interrelated constructs were operational within the Process of Motivation: Significance and Coping. Significance was

associated with the Goal, or objective, Coping to Mechanisms aimed at neutralizing the effects of Reality. The more Significant an objective, the more intense interference from Reality was experienced, and the more manifest these Mechanisms of Coping. Mechanisms of Coping changed the perception of Reality and made one perceive it as more Discrepant from a manifest Reality. The more Significant the objective, the more Discrepant Reality. And the more Discrepant a perceived Reality, the more pronounced these Mechanisms of Coping.

In observing the Process of Interference, evidence could be obtained in the study of the Conditions and Attitudinal and Technical Determinants necessary to address the Process of Motivation. In an approach defined as an Intrinsic Modality in Management of Motivation, these Mechanisms of Coping were specifically addressed to benefit from their inherent properties.

From these conclusions on the Process of Motivation and the Process of Interference a number of important Implications emerged in a final Chapter 11., following the observations made at the onset of the study, extending empirical findings beyond the boundaries of a traditional hypothetico-deductive approach. In Chapter 11.2., it was inferred that assumptions on Mechanisms of Coping could be extended towards larger groups. Following the rationale on Coping, it was suggested Mechanisms of so-called 'Collective Coping' served to neutralize a shared perception by a group of an interfering Reality, which was collectively perceived as obstructing a shared Significant objective to express itself. Collective Coping was a self-propelling communal mechanism to preserve the integrity of a highly valued common Goal. To conclude, in Chapter 11.4., the Intrinsic Modality in Management of Motivation was projected on leadership, and a so-called 'Interactional Leadership' was defined with both Extrinsic and Intrinsic Modalities of expression.

If assumptions made in this study hold true, and conclusions derived from empirical findings may be extended to the Implications made on Collective Coping and Interactional Leadership, these conclusions and Implications may contribute to provide new thoughts and understanding on reoccurrence of human suffering in our time.

Mechanisms of Collective Coping may contribute to provide new thoughts and understanding on reoccurrence of human suffering in our time.

For if we come to translate indifference, apprehension from involvement or even apathy towards conflict, discrimination, genocide, poverty and injustice as an act of Collective Coping, the Implication would be that it serves to neutralize a collective perception of an unsupportable Reality, which, in turn, appears to be obstructing a Significant objective to express itself. Indifference and lack of substantially addressing these issues could be seen as expressions of Collective Coping neutralizing a Reality experienced, in contrast, as Significant in issues that profoundly affect us. In short, we seem passive and indifferent because we care... Perhaps, a sense of bewilderment, helplessness, or unattainable aspirations to be able to act, are at the core of this Collective Coping, indicating an unacceptable Reality is being neutralized from interfering with a Significant objective which can only be envisioned as a will, or intend to act.

The case remains that if these acts could be seen as expressions of Collective Coping, these acts could be disguised expressions because we care. If we feel despair in the sight of war, discrimination, genocide, poverty, injustice, Collective Coping serves as a means to neutralize the agony.

From this perspective, examples of Collective Coping are numerous and extend throughout the spectrum of the human condition:

When, following a proclamation to interfere in a conflict once a 'red line' of a deployment of chemical weapons occurs, we refrain from action, the introduction of a political impasse preventing such action is assumed to be an expression of Collective Coping.

When people are confined to ghettos based on their religion and the world remains at a distance without active intervention despite extensive coverage in media, public outrage expressed without any concrete action to alleviate the suffering of many, is assumed to be an expression of Collective Coping.

When the contours of an unprecedented genocide occur, and no significant intervention follows, public silence or denial can be considered an expression of Collective Coping.

When refugees flee war and poverty and are confined to camps for years, political apprehension to define solutions and public negligence are expressions of Collective Coping.

Indifference to human suffering are expressions of Collective Coping aimed at neutralizing their Significance, thus maintaining a status quo of passivity and unresponsiveness.

Indifference, then, to human suffering can be defined as an expression of Collective Coping. Collective Coping aimed at neutralizing their Significance, maintaining a status quo of passivity and unresponsiveness.

The Epilogue to the findings of the study is to attend to the issue raised in the Prologue: what, can be done to overcome Collective Coping and initiate an act of will to intervene in our destiny?

If the conclusions and subsequent Implications hold true, it is not through public debate. From the observations made, public debate, in its sequence of unfolding statements, in affirmation and refutation, in approval and rejection, is likely to be dominated by expressions of Collective Coping. And Collective Coping, in its aim to neutralize interference, could become a further source of conflict or misunderstanding.

Public debate is an expression of Collective Coping.

Where Collective Coping serves a group-oriented, communal purpose, it is primarily through leadership that Collective Coping is to be addressed. In the famous words expressed by Einstein, proclaiming: "we cannot solve our problems with the same thinking we used when we created them", one might argue that an alternative for a current style in leadership is needed.

Earlier, in Chapter 11.4., Interactional Leadership was introduced, with both Extrinsic and Intrinsic styles of expression. Within the Intrinsic Modality, two main Approaches appeared, elaborating on the major conclusions of the study on the Process of Interference and defined as an Interpersonal and an Intrapersonal Approach within the Intrinsic Interactional Leadership style.

The Intrinsic Interpersonal Approach was meant at initiating a dialogue based on the Attitudinal and Technical Competencies introduced in the study. These Techniques could be used at detecting the source of Mechanisms of Coping, or Collective Coping. Instead of providing Support using a Technique of Passive Assistance throughout the process of Coping, the Approach could be used to focus at detecting the elements within Reality, the process of Coping is aimed at. As a Mechanism of Coping, or Collective Coping, is meant to prevent an unwanted, unacceptable Reality from intruding and interfering with a Significant objective, it provides the key to unlocking the origins we prevent ourselves to be exposed to. Instead of focusing on the medication, we turn towards the source. Instead of engaging in debate and discussion sustaining a Collective Coping, the dialogue would focus at where neutralizing forces of Collective Coping are aiming at, and which underlying Significant objective needs to be preserved and protected.

If we were to pursue such a dialogue, we could obtain a different discourse on issues affecting the human condition.

New insights to prevent a recurrence of human suffering through atrocities of war, genocide, poverty are not to be found in debate, as these aim at sustaining a Collective Coping.

On war: instead of pretending in an act of Collective Coping that we express outrage for the acts of one party against the other, further justifying our points of view by eloquently expressing what both parties should or should not do, we might address the issue by explicitly stating our helplessness and inability in the face of what human history produced at its darkest hour. That people have been shattered by the acts of war, the holocaust, and express their attempts at survival in a way that have injured their surrounding neighbors both materially and in their pride. In defining the source of Collective Coping, we could expose our uneasiness to have been part, directly or indirectly, as victims, bystanders or actors, in the history of an escalating nightmare and in inflicting and sustaining the conflict that emerged from the interplay. By explicitly taking responsibility for short-ranged political solutions produced long years ago, that were taken within a geo-political situation of extreme instability, in the process neglecting profound religious controversies affecting three major world religions, we would instigate feelings of support in the midst of perceived isolation, of recognition instead of neglect, which, in turn, could initiate a rapprochement between parties, or the appearance of new actors avoiding these devastating expressions of Collective Coping.

On discrimination: one might provide an actor of violations of human equality an alternative expression to public condemnation by providing an opportunity of admitting guilt before an institutionalized tribunal, thus emphasizing reconciliation rather than prosecution, without compromising accountability with respect to past violations and reparations for victims.

On genocide: instead of pursuing coordinated actions by means of establishing consensus through organizations institutionalized long ago in a time the world could be reduced to a few prominent actors, one could acknowledge that in a contemporary world the complexity of

forces and acting agencies have made traditional institutions and legislation obsolete and action is to be based on moral grounds, rather than political consensus, or establishment of alliances.

On poverty: instead of proclaiming in an act of Collective Coping that borders should be closed to those living in less privileged circumstances, one might reflect on the discomforting fact that precious few owe their standards of living entirely to their own personal effort, and most rather take advantage of privileged circumstances beyond their influence, such as citizenship by birth, to be able to live in prosperity. And from this observation one might infer that living in wealth rather than poverty, in most cases, is an act of providence, that might arouse compassion, consideration, generosity.

On injustice: instead of pretending in an act of Collective Coping that a scientific truth can be established in an issue for which no apparent cause-and-effect relation has been established, we might address the issue by explicitly stating our ignorance, or rather (and more neutral) our incapacity to 'know with certainty'. And then define within this 'acceptance in incapacity', for instance in a current debate on climate change, a strategy of postponement and reassurance, against envisaging the probabilities of facing a confrontation with consequences at a time when it has become too late to make amendments. Thus, a discussion aimed at the source of Collective Coping could initiate steps towards resolving a disconcerting Reality in our time: an inability to adequately trace and identify those with true knowledge and expertise.

An approach aimed at addressing detrimental effects of Collective Coping would consist of engaging in a different dialogue, that is not aimed at public debate and discussion sustaining a Collective Coping, but rather aimed at exposure of the source these neutralizing forces of Collective Coping are aimed at.

If these assumptions hold true, then, an approach aimed at addressing detrimental effects of Collective Coping would consist of engaging in a different dialogue, that is not aimed at public debate and discussion sustaining a Collective Coping, but rather aimed at exposure of the source these neutralizing forces of Collective Coping are aimed at.

It calls for a departure from traditional leadership styles, in using an approach referred to as an Intrinsic Interpersonal Approach.

In addition, a final and profoundly differing approach through Leadership in addressing Mechanisms of Collective Coping, is through an Intrinsic Intrapersonal Approach.

The Intrinsic Intrapersonal Approach in Interactional Leadership was introduced in Chapter 11.4. The Intrapersonal Approach did not aim at a dialogue, but at re-enacting alternatives for Collective Coping. Instead of participating in debates sustaining Coping, a central political figure approaches an interfering Reality differently by expressing an alternative Coping strategy, by presenting an alternative voice, or a different view for people to adhere to. To do so, requires a supreme discipline in self-reflection. Finding an alternative Coping strategy means one needs to be aware of Reality in its true manifestation. Transcending one's Coping means dissecting a Reality, which is the very source of our Coping: it is 'facing a perceived evil in the eye'. As a result, an example of this Intrapersonal Approach has been seldom expressed and can be found in approaches to Leadership expressed by Mohandas Gandhi or Nelson Mandela. Gandhi, carefully

orchestrating his approach to 'Satyagraha' in defying the rule of the British Empire throughout the nineteen thirties and forties, and Mandela in his approach 'to do better' and to 'deserve' democracy and freedom after the apartheid-era.

This approach aimed at addressing effects of Collective Coping is an exceptional form of leadership as it provides a model to live by, in rising above Collective Coping and exposing its source.

At the basis of a search, then, for alternative expressions of Mechanisms of Collective Coping either in exposing the source or modeling an alternative, is awareness and understanding of the very nature the Collective expression of Coping is aimed at. I propose to define this form of contemplative awareness, which is highly analytic, methodical and rigorous, and rooted in discipline and determination: an attitude of 'Reflectivity'.

In conclusion, then, debate sustains Collective Coping, Reflectivity in transcending Collective Coping opens a royal road to lasting solutions.

When all is said and done, at the closing of this study, it is not passivity and indifference that are at the root of human suffering. It is Collective Coping.

Collective Coping is omnipresent. It is part of the human condition. It is a necessity of life. A medicine that sustains life and, at times, turns against us and emerges in indifference and passivity. And as part of the human condition we are to accept it's overwhelming presence. If we choose to intervene in our destiny to counteract Collective Coping, we have to transcend ourselves by re-translating and re-composing Reality beyond the discourse of Coping, as expressed in leadership, either by means of an Interpersonal Approach, or by re-enacting alternative paths to Coping through an Intrapersonal Approach.

In transcending ourselves beyond a language of Collective Coping, it appears we are invited to act in a biblical sense, to transcend a language of 'earth, wind and fire', that is at the root of most of our present actions, by articulating a new language and by becoming receptive for what has hitherto been silenced and, in its True Sense, resides in a 'gentle whisper'...

Summary in Dutch
De Theatro Motivarum: Motivation, in Search of Essentials

Motivatie: de Zoektocht naar een Algemeen Model
Proefschrift over een Algemeen Verklarend Model van Motivatie en Belangrijkste Determinanten om Motivatie aan te Sturen

Samenvatting

Nooit eerder zijn we beter geïnformeerd geweest over de wereld waarin we leven. We weten 'within minutes' als in Parijs een aanslag wordt gepleegd, of een offensief in een oorlog wordt ingezet, wanneer een kind verdrinkt en zijn foto, liggend op z'n knietjes, de wereld rondgaat en publieke verontwaardiging luidkeels via media wordt geventileerd. De wereld is een dorp geworden. En je zou verwachten dat vanuit een dergelijke, efficiënte en breed gedragen informatievoorziening, sociale onrust, onrechtvaardigheid, armoede, ellende, snel de wereld (letterlijk) uit zou zijn geholpen.

Maar niets is minder waar.

Waarom doen we de dingen die we doen? Waarom persisteren we, vaak tegen beter weten in, in gedrag dat onrust, onrechtvaardigheid, armoede, discriminatie in de hand werkt? Het vakgebied dat zich binnen de wetenschap bezighoudt met dergelijke vraagstukken wordt vanuit de literatuur aangeduid met het begrip 'Motivatie'. Wat brengt een mens tot handelen? Wat is de oorzaak, wat zijn drijfveren? Maar ook: hoe gaan we om met de uitkomst van dat handelen, met succes en falen, met satisfactie en frustratie? Een uitermate breed vakgebied, waarbinnen dan ook veel is gepubliceerd en bijna honderd jaar onderzoek is verricht.

Vanuit de gedachte dat al dat handelen voortkomt uit Motivatie, zijn resultaten tot op heden zeer bescheiden, wanneer je kijkt naar de impact die kennis over Motivatie gehad had kunnen hebben op tolerantie, rechtvaardigheid, welvaart, stabiliteit en wederzijds begrip, om maar een paar te noemen.

Dit proefschrift heeft de ambitie om bij te dragen aan hernieuwde kennis op het gebied van Motivatie. De aanpak in dit proefschrift is een andere dan meestal gebruikelijk is in sociaal wetenschappelijk onderzoek.

In een meer 'traditionele' benadering wordt een hypothese gesteld, veelal gebaseerd op voorafgaand onderzoek, om deze vervolgens in empirisch onderzoek te toetsen. Deze zogeheten 'hypothetico-deductive approach', destijds ingezet door Popper (1959, 1963), heeft het voordeel dat bevindingen doorgaans robuust zijn, getest en gedragen door voortschrijdend inzicht en onderzoek. Een groot nadeel is echter dat een sterk

gefragmenteerd beeld van de werkelijkheid ontstaat: een veelheid aan hypothesen maken nog niet een consistent doordacht verklarend model. Gevolg is dat het in de sociale wetenschappen veelal ontbreekt aan algemene en breed georiënteerde modellen, zoals gebruikelijk was rond het begin van de vorige eeuw. Met een herintroductie van een algemeen, verklarend, theoretisch 'Model van Motivatie', gecombineerd aan een serie, meer 'traditioneel' uitgevoerde onderzoeken, beoogt het proefschrift het beste van twee werelden te combineren.

In een inleidende beschouwing tot het proefschrift, wordt een stapsgewijze aanpak verdedigd die de opbouw van het onderzoeksbetoog verregaand bepaalt.

Begonnen wordt met een algemeen, zogeheten 'inductief afgeleid', verklarend theoretisch Model van Motivatie. Aannames die in het Model worden gemaakt worden vergeleken met de literatuur, zowel met bestaande theorieën als met uitkomsten van (veelal) 'traditioneel' empirisch onderzoek. Uit het Model worden een aantal cruciale hypothesen afgeleid en in vier afzonderlijke empirische studies onderzocht om de 'robuustheid' van het Model te toetsen. In Conclusies worden de meeste hypothesen bevestigd, waarna een aantal Implicaties worden besproken met betrekking tot het Model en een bijdrage aan hernieuwde kennis op het gebied van Motivatie.

Zo bestaat het proefschrift uit volgende onderdelen:

- Een beschrijving van het theoretische Model van Motivatie, in Hoofdstuk 3.
- Een 'inbedding' in uitkomsten van bestaande literatuur, in Hoofdstuk 4.
- Een empirische toetsing van cruciale hypothesen, afgeleid van het theoretische Model, met betrekking tot:
    - het Model van Motivatie, in het bijzonder van de belangrijkste elementen uit het Model, in Hoofdstuk 5,
    - het aansturen van Motivatie, en wel:
        - de Condities waaronder Motivatie wordt aangestuurd, Hoofdstuk 6,
        - de Competenties daarvoor noodzakelijk, Hoofdstuk 7,
        - een Instrumentarium dat daarbij behulpzaam zou zijn, Hoofdstuk 8.
- Een Conclusie, Hoofdstuk 9, waarin de meeste hypothesen worden bevestigd.
- Een Samenvatting, in Hoofdstuk 10.
- Implicaties, in Hoofdstuk 11, die het fundament vormen voor de Epiloog, met een eerste antwoord op de basisvragen uit de Proloog die de aanleiding hebben gevormd tot het schrijven van dit proefschrift.

Onderstaand een beschrijving van deze onderdelen.

In een eerste uiteenzetting van het theoretische Model van Motivatie, afgeleid in een 'inductieve analyse', wordt Motivatie in Hoofdstuk 3 beschouwd als een stapsgewijze 'inner-dialogue' die zich afspeelt rond een doel dat men zich stelt. Het Proces zou bestaan uit een achttal stappen of fasen, in het Model van Motivatie aangeduid als 'Phases', die op hun beurt weer 24 onderdelen, of 'Stages' omvatten. Motivatie wordt geïnitieerd in een eerste 'Phase of Expectancies', een fase waarin het doel geleidelijk gestalte krijgt. De fase wordt gekenmerkt door een fantaseren over het doel, over inzet, over 'voors-en-tegens',

over kansen van slagen. In deze eerste fase, die bestaat uit een aantal Stages, wordt het doel en de daarvoor noodzakelijke investering geleidelijk gepreciseerd. De fase is dan ook cyclisch: het doel wordt aangescherpt, of juist vervaagd, waarna het soms zelfs kan vervluchtigen en verdwijnen. De meeste doelen blijven in het stadium van een Phase of Expectancies hangen, maar soms wordt de daad bij het woord gesteld en treedt een volgende, tweede fase aan in het Proces van Motivatie: een 'Phase of Effort'. In een Phase of Effort wordt waarneembaar gedrag getoond om het doel daadwerkelijk te bereiken. Het initiëren van deze fase brengt risico's met zich mee. Risico's die in een volgende, derde fase, een 'Phase of Internally Evoked Self-Assessment' worden geëvalueerd. Heeft de investering gerendeerd? Is de zaak succesvol verlopen, ten volle of ten dele, of is het zelfs uitgelopen op een falen? En wat zijn de subjectieve gevolgen in termen van ervaren satisfactie en frustratie? Deze fase, die bestaat uit twee Stages, is uitsluitend gericht op een persoonlijke evaluatie zonder inbreng van derden of externe factoren. Want die inbreng vindt plaats in een vierde fase: een 'Phase of Reality', waar de realiteit, de werkelijkheid, zich aandient. Het is de onverwachte input van derden, of van omstandigheden, die het verloop uit voorgaande fasen verstoort, ten goede of ten kwade. En hier treedt een nieuw concept in werking: 'Significance of the Goal', het belang, de significantie van het doel. Hoe belangrijker het doel, hoe groter de confrontatie met deze onvoorziene werkelijkheid die een goede procesgang in het bereiken van het doel interrumpeert. De werkelijkheid vormt een confrontatie, en hoe significanter het doel, hoe heftiger die confrontatie. Op confrontatie volgt impact: een vijfde fase, een 'Phase of Impact', is een directe reactie daarop. In een Phase of Impact wordt de mate van 'Discrepancy' bepaald. Hoe significanter het doel, en hoe harder de confrontatie met de werkelijkheid, hoe groter deze discrepantie. Maar ook: hoe significanter het doel, en hoe gunstiger de werkelijkheid, hoe geringer de confrontatie en hoe kleiner dan juist ook die discrepantie. Deze Phase of Impact is dus een 'reality-check' op de ernst van de situatie. En op die reality-check volgt een evaluatie van de nieuwe situatie: is de werkelijkheid ondersteunend of juist belemmerend in het bereiken van het doel? En is de stand van zaken, zoals aanvankelijk werd voorgesteld in de eerste fase, wel zo goed geweest: een herbeschouwing dus van een aanvankelijk voornemen. In deze zesde 'Phase of Externally Evoked Self-Assessment', die weer bestaat uit meerdere Stages, vinden geen aanpassingen plaats maar alleen evaluaties in het licht van de interfererende realiteit. Evaluaties die gepaard gaan in een zevende, eveneens uit meerdere Stages bestaande 'Phase of Anticipated Change', met een beslissing of voornemen tot het al dan niet aanpassen van parameters uit die eerste, initiële fasen van het Model. Aanschouwen van Impact, evalueren van repercussies en besluitvorming: drie fasen die volgen op een confrontatie met de realiteit. In die drie fasen, zo luidt de analyse, treedt een mechanisme in werking aangeduid als een 'Mechanism of Coping', kortweg: 'Coping'. Coping heeft als uitwerking, in het samenspel van de drie fasen, dat de confrontatie wordt verwerkt in relatie tot het doel dat aanvankelijk werd geformuleerd: is de realiteit ondersteunend aan het doel, dan wordt zij wat positiever, geprononceerder neergezet; vormt de realiteit een belemmering, dan wordt zij wat afgevlakt, neutraler voorgesteld. Het belang van het doel, de significantie, speelt hierbij een rol: hoe significanter het doel, hoe krachtiger het Mechanism of Coping, ten goede of ten kwade. We zetten, zo wordt verondersteld, de realiteit dus naar ons hand. En hoe effectiever we daarin zijn, hoe meer bescherming we bieden aan de integriteit, aan het intact houden van het aanvankelijk gestelde doel. In een

achtste, en laatste 'Phase of Dedication' maken we, wederom in meerdere Stages, de balans op. Niet zozeer van de realiteit, maar meer van de repercussies van de realiteit voor het aanvankelijk in de eerste fase geformuleerde doel. Om dan vervolgens, daadwerkelijk, de parameters in die eerste Phase of Expectancies aan te passen, na de confrontatie met de realiteit en de geleerde lessen daaruit. Met deze terugkeer en mogelijke bijstelling van die initiële parameters, zijn we 'terug-bij-af' en is het Model een cyclisch proces geworden.

In een 'inductief afgeleid', verklarend theoretisch Model, wordt Motivatie dus voorgesteld als een stapsgewijs, cyclisch proces dat gericht is op een doel en dat interferentie van buiten tracht bij te stellen, in positieve of negatieve zin, door mechanismen aangeduid als 'Mechanisms of Coping'.

In Hoofdstuk 4 wordt het Model van Motivatie in twee opzichten vergeleken met uitkomsten vanuit de literatuur. In een beschouwing van bijna honderd theorieën, blijkt het Model, in een visuele presentatie in afzonderlijke Stages, vrijwel al deze theorieën te omvatten en biedt daarmee een onverwacht, algemeen classificatiemodel als referentie voor deze bestaande theorieën. In een daaropvolgende beschouwing van uitkomsten van empirisch onderzoek uit de literatuur, blijken vrijwel alle resultaten congruent met het voorgestelde Model. Niettemin blijken daarnaast ook vermoedens van een sterk gefragmenteerd onderzoeksveld te worden bevestigd.

Vanuit een dergelijke 'inbedding' in de literatuur, worden in het proefschrift vervolgens een viertal onderzoeken uitgevoerd vanuit een 'traditionele', 'hypothetico-deductive approach', ter verdere verificatie van het Model van Motivatie.

In een eerste onderzoek, Hoofdstuk 5, wordt de 'robuustheid' van het Model getoetst aan de hand van een aantal cruciale hypothesen die vooral betrekking hebben op de opbouw van het Model. Een tweetal fasen worden als essentieel gekenmerkt: het zijn de fasen waarin de balans wordt opgemaakt, zowel in het behalen van het geformuleerde doel in de derde fase van een Phase of Internally Evoked Self-Assessment, als in de confrontatie met een interfererende realiteit in de achtste fase van een Phase of Dedication. Aan de hand van een vragenlijst worden alle fasen uit het Model geoperationaliseerd. Een bevestiging wordt verkregen voor de veronderstelling dat beide fasen essentieel zijn in het Model, aan de hand van een aantal statistische analyses. Opmerkelijk is dat deze resultaten worden bevestigd ongeacht cultuur, in onderzoek dat is verricht in de VS, Zuid-Afrika en in Azië, Maleisië. Vanuit deze resultaten wordt tevens geconcludeerd dat beide fasen een goede afspiegeling, en dus ook een goede maatgever voor het meten van Motivatie zouden zijn.

Wat zijn nu de Condities om Motivatie optimaal aan te sturen? In een tweede onderzoek, in Hoofdstuk 6, wordt het Model getoetst op een aantal hypothesen over Condities die in een 'inductieve analyse' zijn afgeleid aan de hand van het Model. Een bevestiging van die hypothesen zou dan wederom bijdragen aan de 'robuustheid' van het Model. Vier Condities worden afgeleid:

- 'Perceived Significance of the Goal, or objective', de mate waarin het doel als als significant wordt ervaren.
- 'Perceived Significance of the Actor-Intervener', de mate waarin diegene die

aanstuurt als significant wordt ervaren.
- 'Perceived Support', de mate waarin ondersteuning wordt ervaren.
- 'Perceived (Mis)-Match in Mutual Perceptions', de mate waarin overeenstemming bestaat in wederzijdse percepties.

Uit het empirisch onderzoek blijkt een bevestiging te worden geboden voor de gestelde hypothesen.

Wat kun je vervolgens doen om deze Condities in gang te zetten en Motivatie daadwerkelijk aan te sturen? In een afleiding aan de hand van het theoretische Model van Motivatie blijkt in Hoofdstuk 7 dat slechts twee Condities beïnvloedbaar zouden zijn. De ene Conditie, 'Perceived Support', vraagt om zogeheten 'Attitudinal Competencies', competenties die vragen om een zekere 'mind-set', of attitude. De andere Conditie, 'Perceived (Mis)-Match in Mutual Perceptions', is met een serie 'Technical Competencies' te adresseren, competenties die meer gedragsmatig en 'actie-gericht' zijn. Attitudinal en Technical Competencies komen in vele soorten en maten. In de oorspronkelijke afleiding is sprake van maar liefst acht vormen van dergelijke Attitudinal en Technical Competencies, ieder met een eigen samenstelling of uitingsvorm, 'Modalities of Intervention' geheten, of 'Modalities in Management of Motivation'. In die acht uitingsvormen, of Modalities, waarin Motivatie aangestuurd kan worden, worden twee hoofdgroepen van ieder vier Attitudinal en Technical Competencies onderscheiden: een 'Extrinsic Modality in Management of Motivation' en een 'Intrinsic Modality in Management of Motivation'. Beide hebben specifieke eigen karakteristieken in het aansturen van Motivatie. In het proefschrift wordt van beide groepen, slechts één Modality beschouwd:

- Een Extrinsic Modality in Management of Motivation, met één Attitudinal Competency, aangeduid als: 'Dignity'; en vier Technical Competencies, aangeduid als: een 'Technical Competency of Providing Extrinsic Preconditions', een 'Technical Competency of Clarifying Extrinsic Outcomes', een 'Technical Competency of Providing Active Assistance', en een 'Technical Competency of Providing Active Feedback'.
  Kenmerkend voor deze Extrinsic Modality is dat diegene die Motivatie aanstuurt 'Control', controle behoudt over het proces; een controle echter die ten koste gaat van 'Productivity', productiviteit.
- Een Intrinsic Modality in Management of Motivation, met maar liefst drie Attitudinal Competencies, aangeduid als: 'Respect', 'Dignity' en 'Trust'; en wederom vier Technical Competencies, die echter een andere uitingsvorm hebben, aangeduid als: een 'Technical Competency of Clarifying Intrinsic Preconditions', een 'Technical Competency of Clarifying Intrinsic Outcomes', een 'Technical Competency of Providing Passive Assistance', en een 'Technical Competency of Providing Passive Feedback'.
  Kenmerkend voor deze aanpak, is dat diegene die Motivatie aanstuurt, niet of nauwelijks controle heeft over het proces, maar daarbij een (zeer) hoge mate van productiviteit behaalt.

In empirisch onderzoek worden de twee Modalities in Management of Motivation op hun effecten op Motivatie onderzocht. Een bevestiging wordt gevonden voor de

gemaakte assumpties, waarmee wederom ook een bevestiging wordt verkregen voor de 'robuustheid' van het Model waaruit deze Competencies zijn afgeleid.

In een vierde en laatste afleiding aan de hand van het Model van Motivatie, wordt in Hoofdstuk 8 een Instrumentarium geïntroduceerd dat ondersteuning zou bieden aan genoemde Competencies. Omwille van omvang is een keuze gemaakt voor uitsluitend een Instrumentarium ter ondersteuning van een Intrinsic Modality in Management of Motivation. Het Instrumentarium bestaat uit twee onderdelen:

- Een Training 'Management van Motivatie' gericht op ondersteuning van Intrinsic Attitudinal Competencies.
- Een Gestructureerd Interview, het 'Personal Motivation Interview', met een vast format gericht op ondersteuning van Intrinsic Technical Competencies.

In het empirisch onderzoek biedt het proefschrift een verkorte versie van uitkomsten van een drietal longitudinale pre-test post-test experimenten, met gebruik van controle groepen, beschreven in Mennes (2016, *in press*). Uitkomsten tonen een significante verbetering van Motivatie bij frequent gebruik van het Instrumentarium ten opzichte van controle groepen. Waar zowel de Training, alsook het Gestructureerde Interview ontwikkeld zijn op basis van het Model van Motivatie, bieden deze uitkomsten een verdere bevestiging van het Model.

In een Samenvatting en Conclusie van het proefschrift, Hoofdstuk 9 en 10, wordt gesteld dat een algemeen, verklarend theoretisch Model van Motivatie is gepresenteerd, dat 'inductief' is afgeleid, en waarvan aannames grotendeels bevestigd lijken te worden vanuit theoretische en empirische bevindingen uit de literatuur. Uit het Model zijn cruciale hypothesen afgeleid en in vier separate onderzoeken getoetst volgens een 'hypothetico-deductive approach' om de 'robuustheid' van het Model te verifiëren. In een concluderende beschouwing wordt geconstateerd dat vrijwel alle hypothesen uit het empirisch onderzoek lijken te worden bevestigd.

Een dergelijke, eerste bevestiging van cruciale hypothesen uit het Model, geeft aanleiding tot het formuleren van een aantal Implicaties, Hoofdstuk 11, die mogelijk kunnen bijdragen aan een hernieuwde kennis op het gebied van Motivatie. In een beschouwing van het samenspel tussen significantie van het doel, de getoonde inzet in een Phase of Effort en de confrontatie met de realiteit, worden een aantal uitspraken gedaan over de werking van Mechanisms of Coping. En deze uitspraken, op hun beurt, geven aanleiding tot de introductie van het concept 'Collective Coping'. Mechanismen van Collective Coping manifesteren zich wanneer een groep met een gelijkgestemd doel van een gelijkgestemde significantie, geconfronteerd wordt met een interfererende realiteit. Het is een zichzelf versterkend mechanisme dat tot doel heeft om een gezamenlijk gedragen significant doel, 'gesynchroniseerd' te beschermen tegen ongewenste externe beïnvloeding. Verondersteld wordt dat Collective Coping twee verstrekkende gevolgen heeft: waar Coping meestal plaatsvindt in interactie en communicatie met anderen, richt Collective Coping zich op bevestiging van neutraliserende mechanismen, en niet op uitwisseling van een gezamenlijk gedragen significant doel of een gezamenlijk gedragen perceptie van een confronterende werkelijkheid. Collective Coping is een uiting, een gevolg en geen oorzaak. Collective Coping is symptoombestrijding en gaat voorbij aan

inhoud en oorzaak: aan behoud van een significant doel en neutraliseren van een confronterende werkelijkheid. Veelal is het publieke debat een uiting van Collective Coping. Wanneer deze veronderstelling juist is, dan is het publieke debat *niet* de juiste weg tot het oplossen van vraagstukken.

Vanuit de gedachte dat al het menselijk handelen voortkomt uit Motivatie, is de ambitie van dit proefschrift geweest om elementaire mechanismen daarvan bloot te leggen en met hernieuwde kennis bij te dragen aan tolerantie, rechtvaardigheid, welvaart, stabiliteit en wederzijds begrip.

Nooit eerder zijn we beter geïnformeerd geweest over de wereld waarin we leven. Maar waar het publieke debat, en een breed geventileerde verontwaardiging meestentijds uitingen zijn van Collective Coping, zullen zij niet bijdragen aan de oplossing van sociale onrust, onrechtvaardigheid, armoede, ellende. Het is in een traceren van een gezamenlijk gedragen significant doel, en in het preciseren van een gezamenlijk gepercipieerde pijnlijke werkelijkheid dat een oplossing wordt geboden voor de oorzaken van menselijk handelen. Betoogd wordt in de Epiloog van het proefschrift dat daartoe niet het publieke debat, maar een andere vorm van dialoog, vanuit een ander perspectief gevoerd zou moeten worden.

Curriculum Vitae

Menno Mennes was born in Singapore and lived the first years of his life at several locations in South-East Asia, before moving to Paris, France.

Menno holds a cum laude degree in Clinical Psychology from the University of Utrecht, The Netherlands, majoring on several research studies on Motivation.

After completing his studies he joined the University of Nijmegen, The Netherlands, as a Research Associate in Applied Educational Psychology. In the mid-eighties he became Assistant Professor in Educational Psychology at Erasmus University Rotterdam, The Netherlands. During this period he started with his first formulation of a theoretical Model of Motivation.

In the mid-nineties he co-founded a research institute on Motivation and became its first director. After an affiliation with Erasmus University Rotterdam, the institute became an independent research institution on January 1st 1999. His research on Motivation further progressed in subsequent years at companies including Motorola, Philips, NXP, IBM, KLM Royal Dutch Airlines, Shell, Telecom Italia, TNT Express Worldwide, PTT Post and KPN Mobile.

In 2005 Menno Mennes was appointed at Leiden University. Lecturing in Human Resource Management and Organizational Behavior, he was nominated for, and received a number of university laureates. In 2011 he joined the Honours Academy of Leiden University for talented and outstanding students. As of 2012 he is responsible for its Master Honours Programme as Programme Director.

Menno Mennes is happily married and is a proud father of four sons, three daughters-in-law, and, as a novice granddaddy, of two grandsons.

References

Aarts, H. & Custers, R. (2012). Unconscious goal pursuit: Nonconscious goal regulation and motivation. In: Ryan, R.M. (Ed.), *The Oxford handbook of human motivation (pp. 232-247).* Oxford: Oxford University Press.

Adelman, H.M., & Maatsch, J.L. (1955). Resistance to extinction as a function of the type of response elicited by frustration. J*ournal of Experimental Psychology, 50,* 61-65.

Adorno, T.W., Frenkel-Brunswick, E., Levinson, D. J., & Sanford, R.N. (1950). *The authoritarian personality*. New York: Harper.

Agresti, A. (2002). *Categorical Data Analysis*. New York: Wiley-Interscience.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In: J. Kuhl, & J. Beckmann (Eds.) *Action control: From cognition to behavior (pp. 11-39)*. New York: Springer-Verlag.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes.* 50, 179-211.

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology, 10*, 27-58.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology, 32*, 665-683.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Engelwood Cliffs: Prentice Hall.

Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In: Albarracin, D., Johnson, B.T., & Zanna M.P. (Eds.), *The handbook of attitudes.* Mahwah: Lawrence Erlbaum Associates.

Alderfer, C.P. (1972). *Existence, relatedness, and growth: Human needs in organizational settings*. New York: Free Press.

Alker, H.A. (1972). Is personality situationally specific or intrapsychically consistent? *Journal of mental Psychology*, *40*, 1-16.

Allport, G.W. (1966). Traits revisited. *American Psychologist, 21*, 1-10.

Altman, D.G., & Bland, J.M. (1994). Statistics notes: Diagnostic tests 1: sensitivity and specificity. *British Medical Journal, 308,* 1552.

American Psychological Association (2001). *Publication manual of the American Psychological Association* (5th edtion). Washington, DC: American Psychological Association.

American Psychological Association (2010). *Publication manual of the American Psychological Association* (6th edition). Washington, DC: American Psychological

Association.

Amsel, A. (1958). The role of frustrative nonreward in noncontinuous reward situations. *Psychological Bulletin, 55,* 102-119.

Amsel, A. (1967). Partial reinforcement. In: K.W. Spence & J.A. Taylor (Eds.), *The psychology of learning and motivation* (Vol. 1). New York: Academic Press.

Amsel, A. (1972). Behavioral habituation, counter conditioning, and a general theory of persistence. In: A.H. Black & W.F. Prokasy (Eds.), *Classical conditioning II: Current research and theory*. New York: Appleton-Century-Crofts.

Amsel, A., & Roussel, J. (1952). Motivational properties of frustration: I. Effect on a running response of the addition of frustration to the motivational complex. J*ournal of Experimental Psychology, 43,* 363-368.

Amsel, A., & Ward, J.S. (1954). Motivational properties of frustration: II. Frustration drive stimulus and frustration reduction in selective learning. *Journal of Experimental Psychology, 48*, 37-47.

Amsel, A., & Ward, J.S. (1965). Frustration and persistence: Resistance to discrimination following prior experience with the discriminanda. *Psychological Monographs,* 79 (4, Whole No. 597).

Argyle, M. (1953). The relay test room in retrospect. *Occupational Psychology, 27*, 98-103.

Arkes, H.R., & Garske, J.P. (1977). *Psychological theories of motivation.* Monterey: Brooks Cole.

Aronson, E. (1968). Dissonance theory: Progress and problems. In: Ableson et al. (Eds.), *Theories of cognitive consistency: A sourcebook* (pp. 5-27). Chicago: Rand McNally.

Aronson, E. (1992). The return of the repressed: Dissonance theory makes a comeback. *Psychological Inquiry, 3* (4), 303-311.

Aronson, E., & Carlsmith, J.M. (1962). Performance expectancy as a determinant of actual performance. *Journal of Abnormal and Social Psychology*, 65, 178-182.

Aronson, E., & Carlsmith, J. (1963). The effect of severity of threat on the devaluation of forbidden behavior. *Journal of Abnormal and Social Psychology, 66,* 584-588.

Aronson, E., & Mills, J. (1959). The effects of severity of initiation on liking for a group. J*ournal of Abnormal and Social Psychology, 59,* 177-181.

Atkinson, J.W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64,* 359-372.

Atkinson, J.W. (1964). *An introduction to motivation.* New York: Van Nostrand Reinhold.

Atkinson, J.W., & Birch, D. (1970). *The dynamics of action*. New York: Wiley.

Atkinson, J.W., & Birch, D. (1978). *An introduction to motivation (2nd ed.)*. New York: Van Nostrand.

Atkinson, J.W., & Feather, N.T. (1966). *A theory of achievement motivation*. New York: Wiley.

Atkinson,].W., & Litwin, G.H. (1960). Achievement motive and test anxiety conceived as motive to approach success and motive to avoid failure. *Journal of Abnormal Social Psychology, 60,* 52-63.

Ayer, A.J. (1972). *Probability and evidence*. New York: Columbia University Press.

Baldwin, A.L.A. (1969). Cognitive theory of socialization. In: D.A. Goslin (Ed.), *Handbook of socialization theory and research*. Chicago: Rand McNally.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50,* 248-287.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28,* 117-148.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York NY: Freeman.

Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science, 9,* 75-78.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. In: S. Fiske, D. L. Schacter, & C. Zahn-Waxler (Eds.), *Annual review of psychology* (p. 52). Palo Alto: Annual Reviews.

Bandura, A. (2002). Growing primacy of human agency in adaptation and change in the electronic era. *European Psychologist,* 7, 2-16.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1,* 164-180.

Bandura, A. & Walters, R. H. (1963). *Social learning and personality development*. New York: Holt, Rinehart & Winston.

Bandura, A., Ross, D. & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology, 63,*575-582.

Bargh, J.A. (2006). What have we been priming all these years? On the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology, 36,* 147-168.

Bargh, J.A. Gollwitzer, P.M, Lee Chai, A., Barndollar, K. & Trötschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81,* 1014-1027.

Barker, M. (1967). *Introduction and hypothesis*. Ithaca, NY: Cornell University Press.

Baron, R.A. (1974a). The aggression-inhibiting influence of heightened sexual arousal. *Journal of Personality and Social Psychology, 30,* 318-322.

Baron, R.A. (1974b). Sexual arousal and physical aggression: The inhibiting influence of "cheese cake"and nudes. *Bulletin of Psychonomic Society, 3,* 337-339.

Baron, R.A. & Bell, P.A. (1977). Sexual arousal and aggression by males: Effect of type of erotic stimuli and prior provocation. *journal of Personality and Social Psychology, 35,* 79-87.

Bator, R.J. & Cialdini, R.B. (2006). The nature of consistency motivation: Consistency, aconsistency, and anticonsistency in a dissonance paradigm. *Social Influence, 1,* 208-233.

Baumeister, R.F., Dale, K. & Sommer, K. (1998). Freudian Defense Mechanisms and Empirical Findings in Modern Social Psychology: Reaction Formation, Projection, Displacement, Undoing, Isolation, Sublimation, and Denial. *Journal of Personality, 66,* 1081-1124.

Baumeister, R.F., Heatherton, T.F. & Tice, D.M. (1994). *Losing control: Why people fail at self-regulation.* San Diego, CA: Academic Press.

Beach, F.A. (1955). The descent of instinct. *Psychological Review, 62,* 401-410.

Beck, R.C. (1978). *Motivation: Theories and principles.* Englewood Cliff: Prentice Hall.

Beck, R.C. (2000). *Motivation: Theories and principle* (4th ed.). Upper Saddle River: Prentice Hall.

Bem, D.J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. Psy*chology Review, 74*, 183-200.

Bem, D.J. (1970). *Beliefs, attitudes, and human affairs.* Monterey: Brooks/Cole.

Bennett, A.M.H. (1961). Sensory deprivation in aviation. In: P. Solomon et al. (Eds.), *Sensory deprivation* Cambridge, Mass.: Harvard University Press.

Bentham, J. (1779). *An introduction to the principles of morals and legislation*. Oxford: B. Blackwell, 1948.

Bentler, P.M. & Chou, C.P. (1987). Practical issues in structural modeling. *Sociological Methods & Research, 15,* 78-117.

Berkowitz, L. (1970). The contagion of violence. In: W. J. Arnold & M. M. Page (Eds.), *Nebraska symposium on motivation*. Lincoln: University of Nebraska Press.

Berkowitz, L. (1974). Some determinants of impulsive aggression: Role of mediated associations with reinforcements for aggression. *Psychological Review, 81,*165-176.

Berkowitz, L. & Geen, R.G. (1966). Film violence and the cue properties of available targets. *Journal of Personality and Social Psychology, 3*, 525-530.

Berkowitz, L. & LePage, A. (1967). Weapons as aggression eliciting stimuli. *Journal of Personality and Social Psychology.*

Berlyne, D.E. (1958). The influence of complexity and novelty in visual figures on orienting responses. *Journal of Experimental Psychology, 55,* 289-296.

Berlyne, D.E. (1960). *Conflict, arousal, and curiosity.* New York: McGraw-Hill.

Berlyne, D.E. (1963). Motivational problems raised by exploratory and epistemic behavior. In: S. Koch (Ed.), *Psychology: A study of a science* (Vol. 5). New York: McGraw-Hill.

Bindra, D. (1968). Neuropsychological interpretation of the effects of drive and incentive- motivation on general activity and instrumental behavior. *Psychological Review,* 1968, *75,* 1-22.

Bindra, D. (1969). The interrelated mechanisms of reinforcement and motivation, and the nature of their influence on response. In: W.J. Arnold & D. Levine (Eds.), *Nebraska symposium on motivation.* Lincoln: University of Nebraska Press.

Bindra, D. (1972). A unified account of classical conditioning and operant training. In: A.H. Black & W.F. Prokasy (Eds.), *Classical conditioning II: Current research and theory.* New York: Appleton-Century-Crofts.

Bindra, D. (1974). A motivational view of learning, performance, and behavior modification. *Psychological Review, 81,* 199-213.

Birch, D., Atkinson, J.W. & Bongort, K. (1974). Cognitive control of action. In: B. Weiner (Ed.), *Cognitive views of human motivation.* New York: Academic Press.

Black, M. (1954). 'Pragmatic' Justifications of Induction. In: M. Black (Ed.), *Problems of Analysis*. Ithaca, NY: Cornell University Press.

Black, M. (1959). Can induction be vindicated? *Philosophical Studies, 10,* 5-16.

Black, M. (1970). *Margins of precision*. Ithaca, NY: Cornell University Press.

Black, R.W. (1969). Incentive motivation and the parameters of reward in instrumental conditioning. In: W. J. Arnold & D. Levine (Eds.), *Nebraska symposium on motivation.* Lincoln: University of Nebraska Press.

Blum, G.S.A. (1961). *A model of the mind*. New York: Wiley.

Blum, M.L. & Naylor, J.C. (1968). *Industrial Psychology: Its theoretical and social foundations*. New York: Harper & Row.

Bolles, R.C. (1974). Cognition and motivation: Some historical trends. In: B. Weiner (Ed.), *Cognitive views of human motivation.* New York: Academic Press.

Bolles, R.C. (1967). Theory *of motivation.* New York: Harper & Row.

Bolles, R.C. (1975). *Theory of motivation* (2nd ed.). New York: Harper & Row.

Bolles, R.C. & Moot, S.A. (1972). Derived motives. In: P.H. Mussen & M.R. Rosenzweig (Eds.), *Annual review of Psychology, 23*, 51-72.

Bowers, K. (1973). Situationism in psychology: An analysis and a critique. *Psychological Review*, *80*, 307-336,

Bowlby, J. (1973). *Attachment and loss, vol. 11: Separation.* New York: Basic Books.

Bowlby, J. & Parkes, C.M. (1970). Separation and loss within the family. In: E.]. Anthony & C. Koupemik (Eds.), The *child in his family.* New York: Wiley.

Box, G.E.P. (1949). A general distribution theory for a class of liklihood criteria. *Biometrika, 36,* 317-346.

Box, G.E.P. (1954a). Some theorems on quadratic forms applied in the study of analysis of variance problems: I Effect of inequality of variances in the one-way classification. *Annals of Mathematical Statistics, 25,* 290-302.

Box, G.E.P. (1954b). Some theorems on quadratic forms applied in the study of analysis of variance problems: II Effect of inequality of variances and of correlation of errors in the two-way classification. *Annals of Mathematical Statistics, 25, 484-498*.

Box, G.E.P. & Andersen, S.L. (1955). Permutation theory in the derivation of robust criteria and the study of departures from assumption. *Journal of the Royal Statistical Society, Series B, 17,* 1-26.

Brehm, J.W. (1962). Motivation effects of cognitive dissonance. In: M. R. Jones (Ed.), *Nebraska symposium on motivation.* Lincoln: University of Nebraska Press.

Brehm, J.W. (1972). *Responses to loss of freedom: A theory of psychological reactance*. Morrisontown: General Learning Press.

Brehm, J.W. (1966). *A theory of psychological reactance*. New York: Academic Press.

Bright Wilson, E. (1990). *An introduction to scientific research.* New York: Dover Publications Inc.

Broad, C.D. (1944). Hr. Von Wright on the Logic of Induction. *Mind, a Quarterly Review of Psychology and Philosophy (Vol. LIII, No. 209).*

Broadhurst, P.L. (1957). Emotionality and the Yerkes-Dodson Law. *Journal of experimental psychology, 54*, 345-352.

Bronowski, J. & Mazlish, B. (1970). *The Western Intellectual Tradition, from Leonardo to Hegel.* London: Penguin Books.

Brown, J.S. (1961). *The motivation of behavior*. New York: McGraw-Hill.

Brown, J.S. & Farber, I.E. (1952). Emotions conceptualized as intervening variables: With suggestions toward a theory of frustration. *Psychological Bulletin, 48*, 465-495.

Brown, J.S., Kalish, H.I. & Farber, I.E. (1951). Conditioned fear as revealed by magnitude of startle response to an auditory stimulus. *journal of Experimental Psychology, 41,* 317-328.

Bryan, J.H. & Test, M.A. (1967). Models and helping: Naturalistic studies in aiding behavior. *Journal of Personality and Social Psychology, 6*, 400-407.

Buhler, C. (1972). *Introduction to humanistic psychology*. Bellmont, CA: Wadsworth Publishing.

Buhler, C. & Allen, M. (1972). *Introduction to humanistic psychology*. Monterey, CA: Brooks/Cole Publishing Company.

Buhler, C. & Marschak, M. (1967). Basic tendencies of human life. In: Buhler, C., & Massarik, F. (Eds.), *The course of human life*. New York: Springer Publishing.

Buss, D.M. (2005). *The handbook qf evolutionary psychology.* Hoboken: Wiley.

Buss, D.M. (2008). *Evolutionary psychology: The new science of the mind* (3rd ed.). Boston: Allyn & Bacon.

Bynner, W. (1994). *The way of life – According to Lao Tzu.* New York: A Perigee Book.

Byrne, D. (1964). Repression-sensitization as a dimension of personality. In: B.A. Maher (Ed.), *Progress in experimental personality research* (Vol. #1). New York: Academic Press.

Campbell, D.T. & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56,* 81-105.

Campbell, D.T. & Stanley, J.C. (1963). Experimental and quasi-experimental designs for research. Chicago: Rand McNally.

Caprara, G.V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G.M., Barbaranelli, C. & Bandura, A. (2008). Longitudinal analysis of the role of perceived efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology, 100,* 525-534.

Carlson, N.R. (2010). *Physiology of behavior* (10th ed.). Boston: Allyn & Bacon.

Carnap, R. (1966). *Philosophical foundations of physics: An introduction to the philosophy of science*. New York: Basic Books.

Carnap, R. (1971). *Logical foundations of probability*. Chicago, IL: University of Chicago Press.

Carver, C.S., & Scheier, M.F. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. New York: Springer Verlag.

Carver, C.S., & Scheier, M.F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, *97*, 19–35.

Carver, C.S., & Scheier, M.F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.

Carver, C.S., & Scheier, M.F. (1999). Several more themes, a lot more issues: Commentary on the commentaries. In: R.S. Wyer, (Ed.), *Advances in social cognition* (pp. 261–302). Mahwah, NJ: Erlbaum.

Carver, C.S., & Scheier, M.F. (2012). Cybernetic control processes and the self-regulation of behavior. In: Ryan, R.M. (Ed.), *The Oxford handbook of human motivation (pp. 28-42)*. Oxford: Oxford University Press.

Cattell, R.B. (1966). The scree test for the number of factors. *Multivariate Bahvorial Research, 1,* 245-276.

Child, D. (1990). *The essentials of factor analysis*. London: Cassel Education Limited.

Cialdini, R.B., Trost, M.R. & Newsom, J.T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology, 69,* 318-328.

Clagett, M. (1969). *Critical problems in the history of science: proceedings of the institute for the history of science*. Wisconsin: University of Wisconsin Press.

Clemes, S. (1964). Repression and hypnotic amnesia. *Journal of Abnormal and Social Psychology, 69,* 62.

Clinch, J.J. & Keselman, H.J. (1982). Parametric alternatives to the analysis of variance. *Journal of Educational Statistics, 7,* 207-214.

Cofer, C.N. & Appley, M.H. *Motivation: Theory and research.* New York: Wiley, 1964.

Cohen, J. (1968). Multiple regression as a general data-analytic system. *Psychological Bulletin, 70,* 426-443.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum Associates.

Cohen, J. (1990). Things I have learned (so far). *American Psychologist, 45,* 1304-1312.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, J. (1994). The earth is round (p<.05). *American Psychologist, 49,* 997-1003.

Cohen, J., Cohen, P., West, S.G. & Aiken, L.S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences.* New York: Taylor&Francis.

Cohen, M.R. & Nagel, E. (1934). *An introduction to logic and scientific method*. New York: Harcourt, Brace.

Colberg, M., Nester, M.A. & Cormier, S.M. (1982). Inductive reasoning in psychometrics: A philosophical corrective. *Intelligence, 6,* 139-164.

Colberg, M., Nester, M.A. & Trattner, M.H. (1985). Convergence of the inductive and deductive models in the measurement of reasoning abilities. *Journal of Applied Psychology, 70,* 681-694.

Comrey, A.L., & Lee, H.B. (1992). *A first course in factor analysis*. Hillsdale, NJ: Erlbaum.

Conant, J.B. (1947). *On understanding science*. New Haven: Yale University Press.

Cook, T.D. & Campbell, D.T. (1979). *Quasi-experimentation, design & analysis issues for field settings.* Boston: Houghton Mifflin Company.

Cooley, W.W. & Lohnes, F.R. (1971). *Multivariate data analysis.* New York: Wiley

Cooper, C.L. & Robertson, I.T. (1986). Editorial foreword. In: *International review of industrial and organizational psychology*. Chichester, UK: John Wiley & Sons.

Cooper, J. (1992). Dissonance and the return of the self-concept. *Psychological Inquiry, 3*, 320-323.

Cooper, J. (1999). Unwanted consequences and the self: In search of the motivation for dissonance reduction. In: E. Harmon-Jones & J. Mills (Eds.), *Cognitive dissonance 40 years later: Revival with revisions and controversies (pp. 149-174).* Washington: American Psychological Association.

Cooper, J. & Fazio, R.H. (1984). A new look at dissonance theory. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 229-262). Hillsdale: Erlbaum.

Copleston, F.S.J. (1994). *A history of philosophy* (Vol. I-IX). New York: Doubleday.

Cortina, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78,* 98-104.

Cramér, H. (1999). *Mathematical Methods of Statistics.* Princeton: Princeton

University Press.

Crandall, C.S., Silvia, P.J., N'Gbala, A.N., Tsang,J.-A. & Dawson, K. (2007). Balance theory, unit relations, and attribution: The underlying integrity of Heiderian theory. *Review of General Psychology, 11,* 12-30.

Crandall, V.J. (1955). An investigation of the specificity of reinforcement of induced frustration. *Journal of Social Psychology*, *41*, 311-318.

Crespi, L.P. (1942). Quantitative variation of incentive and performance in the white rat. *American journal of Psychology, 55,* 467-517.

Cronbach, L.J. (1957). The two disciplines of scientific psychology. *The American Psychologist, 12,* 671-684.

Custers, R. & Aarts, H. (2010). The unconscious will: How the pursuit of goals operates outside of conscious awareness. *Science, 329,* 47-50.

de Charms, R. (1968). *Personal causation: The internal affective determinants of behavior.* New York: Academic Press.

de Charms, R. (1972). Personal causation training in the schools. *Journal of Applied Social Psychology, 2*, 95-113.

de Charms, R. (1976). *Enhancing motivation: Change in the classroom*. New York: Irvington Publishers.

de Charms, R., Morrison, H.W., Reitman, W.R. & McClelland, D.C. (1955). Behavioral correlates of directly measured and indirectly measured achievement motivation. In: D. C. McClelland (Ed.), *Studies in motivation*. New York: Appleton-Century-Crofts.

DeBusk, R.F., Miller, N.H., Superko, H.R., Dennis, C.A., Thomas, R.J., Lew, H.T., Berger, W.E., Heller, R.S., Rompf, J., Gee, D., Kraemer, H.C., Bandura, A., Ghandour, G., Clark, M., Shah, R.V., Fisher, L. & Taylor, C.B. (1994). A case-management system for coronary risk factor modification after acute myocardial infarction. *Annals of Internal Medicine, 120,* 721-729.

Deci, E.L. (1975). *Intrinsic motivation.* New York: Plenum.

Deci, E.L. (1980). *The psychology of self-determination.* Lexington, MA: D. C. Heath (Lexington Books).

Deci, E.L. & Ryan, R.M. (1980). The empirical exploration of intrinsic motivational processes. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 39-80). New York: Academic Press.

Deci, E.L. & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

Deci, E.L. & Ryan, R.M. (1991). A motivational approach to self: Integration in personality. In: R. Dienstbier (Ed.), *Nebraska symposium on motivation: Perspectives on motivation* (pp. 237-288). Lincoln: University of Nebraska Press.

Deci, E.L. & Ryan, R.M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11,* 227-268.

Deci, E.L. & Ryan, R.M. (2002). Self-determination research: Reflections and

future directions. In: E.L. Deci & R.M. Ryan (Eds.), *Handbook of self-determination research* (pp. 431-441). Rochester: University of Rochester Press.

Deci, E.L. & Ryan, R.M. (2008). Self-determination theory: A macrotheory of human motivation, development and health. C*anadian Psychology, 48,* 182-185.

Deci, E.L. & Ryan, R.M. (2012a). Self-determination theory. In: P. A. M. Van Lange, A.W. Kruglanski & E.T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 416-437).Thousand Oaks, CA: Sage

Deci, E.L. & Ryan, R.M. (2012b). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In: R.M. Ryan (Ed.), *Oxford handbook of human motivation* (pp. 85-107). Oxford: Oxford University Press.

Deci, E.L., Koestner, R. & Ryan, R.M. (1999). A meta analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125,* 627-668 .

Deci, E.L., Ryan, R.M. & Guay, F. (2013). Self-determination theory and actualization of human potential. In: D. McInerney, H. Marsh, R. Craven, & F. Guay (Eds.), *Theory driving research: New wave perspectives on self processes and human development* (pp. 109-133). Charlotte, NC: Information Age Press.

Dekker, S. & Fischer, R. (2008). Cultural differences in academic motivation goals: a meta-analysis across 13 societies. *The Journal of Educational Research, 102,* 99-110.

Dember, W.N. & Earl, R.W. (1957). Analysis of exploratory, manipulatory; and curiosity behaviors. *Psychological Review, 64, 91-96.*

Dember, W.N. (1956). Response by the rat to environmental change. *Journal of Comparative and Physiological Psychology, 49*, 93-95.

Dember, W.N. (1960). *The psychology of perception*. New York: Holt.

DiStefano, C., Zhu, M., & Mindrila, D. (2009). Understanding and using factor scores: considerations for the applied researcher. *Practical Assessment, Research & Evaluation, 14, Number 20 (*electronic journal).

Dollard, J., Miller, N.E., Doob, L.W., Mowrer, O.H., & Sears, R.R. (1939). *Frustration and aggression.* New Haven, CT: Yale University Press.

Donnerstein, E., Donnerstein, M. & Evans, R. (1975). Erotic stimuli and aggression: Facilitation or inhibition. *Journal of Personality and Social Psychology, 32,* 237-244.

Donovan, J. (2001). Work motivation. In: Anderson, N., Ones, D.S., Sinangil, H.K. & Viswesvaran, C. (Eds.). *Handbook of Industrial, Work & Organizational Psychology: Volume 2 - Organizational Psychology (pp. 53-76).* London: Sage Publications.

Dreisbach, G. & Goschke, T. (2004). How positive affect modulates cognitive control: Reduced perseveration at the cost of increased distractibility. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30,* 343–353.

Duffy, E. (1962). *Activation and behavior.* New York: Wiley.

Dunteman, G.E. (1989). *Principal components analysis.* Sage university paper series on quantitative applications in the social sciences, 07-069. Newbury Park, CA:

Sage.

Durbin, J. & Watson, G.S. (1951). Testing for serial correlation in least squares regression, II. *Biometrika, 30,* 159-178.

Eisman, E. (1966). Effects of deprivation and consummatory activity on heart rate. *Journal of Comparative and Physiological Psychology, 62*, 71-75.

Ekstrom, R.B., French, J.W. & Harman, H.H. (1976). *Manual for kit of factor-referenced cognitive tests*. Princeton, NJ: Educational Testing Service.

Elliott, M.H. (1929). The effect of change of reward on the maze performance of rats. *University of California Publications in Psychology, 4,* 19-30.

Elliott, E.S., & Dweck C.S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality & Social Psychology, 54,* 5-12.

Entwisle, D.R. (1972). To dispel fantasies about fantasy-based measures of achievement motivation. *Psychological Bulletin, 77*, 3 77-391.

Escalona, S.K. (1939). The effect of success and failure upon the level of aspiration and behavior in manic-depressive psychoses. University of Iowa: *Studies in Child Welfare, 16*, 307.

Evans, J.S.B.T. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology, 59,* 255-278.

Faul, F., Erdfelder, E., Buchner, A. & Lang, A.G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41,* 1149-1160.

Fazio, R. H., Zanna, M. P., & Cooper, J. (1977). Dissonance and self-perception: An integrative view of each theory's proper domain of application. *Journal of Experimental Social Psychology, 13,* 464-479.

Feather, N.T. (1961). The relationship of persistence at a task to expectations of success and achievment related motives. *Journal of Abnormal and Social Psychology, 63,* 552-561.

Feeney, A. & Heit E. (2007). *Inductive reasoning: experimental, developmental, and computational approaches*. New York, NY: Cambridge University Press.

Feigl, H. (1950). De principiis non disputandum… In: M. Black (Ed.), *Philosophical Analysis.* Ithaca, NY: Cornell University Press.

Feigl, H. (1954). Scientific method without metaphysical presuppositions. *Philosophical Studies, 5,* 17-28.

Feigl, H. (1956). Some major issues and developments in the philosophy of science of logical empiricism. In: H. Feigl & M. Scriven (Eds.), *The foundations of science and the concepts of psychology and psychoanalysis (Vol. I). Minnesota Studies in the Philosphy of Science.* Minneapolis: University of Minnesota Press.

Feigl, H. & Morris, C. (1969). *International encyclopedia of unified science: Bibliography and index* (Vol. 2, No. 10). Chicago, IL: University of Chicago Press.

Ferguson, E.D. (1976). *Motivation: An experimental approach.* New York: Holt, Rinehart, & Winston.

Ferguson, M.J., Hassin, R. & Bargh, J.A. (2008). Implicit motivation: Past, present, and future . In: Shah, J.Y. & Gardner, W.L. (Eds.), *Handbook of Motivation Science (pp. 150-166)*. New York & London: The Guilford Press.

Feshbach, S. (1964). The function of aggression and the regulation of aggressive drive. *Psychological Review*, *71*, 257-272.

Feshbach, S., & Singer, R.D. (1971). *Television and aggression*. San Francisco: Jossey-Bass.

Festinger, L. (1942a). A theoretical interpretation of shifts in level of aspiration. *Psychological Review, 49*, 235-250.

Festinger, L. (1942b). Wish, expectation and group standards as factors influencing the level of aspiration. *Journal of Abnormal Psychology, 37,* 184-200.

Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston: Row, Peterson.

Festinger, L. & Carlsmith, J.M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology, 58*, 203-210.

Field, A. (2005). *Discovering Statistics Using SPSS.* London: Sage Publications.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduciton to theory and research*. Reading: Addison-Wesley.

Fishbein, M. & Cappella, J.N. (2006). The role of theory in developing effective health communications. *Journal of Communication*, 56, S1-S17.

Fisher, C.D. (1978). The effects of personal control, competence, and extrinsic reward systems on intrinsic motivation. *Organizational Behavior and Human Performance, 21,* 273-288.

Fiske, D.W. & Campbell, D.T. (1992). Citations do not solve problems. *Psychological Bulletin, 112,* 393-395.

Flaherty, C.F. (1982). Incentive contrast: Are view of behavioral changes following shifts in reward. *Animal Learning and Behavior, 10,* 409-440.

Fowler, H. (1967). Satiation and curiosity: Constructs for a drive and incentive-motivational theory of exploration. In: K.W. Spence & J.T. Spence (Eds.), *The psychology of learning and motivation* (Vol. 1). New York: Academic Press.

Franke, R.H. & Kaul, J.D. (1978). The Hawthorne experiments: First statistical interpretation. *American Sociological Review, 43*, 623-643.

Frazio, R.H., Zanna, M.P. & Cooper, J. (1977). Dissonance and self-perception: An integrative view of each theory's proper domain of application. *Journal of Experimental Social Psychology, 13,* 464-479.

French, J.W., Ekstrom, R.B. & Price, L.A. (1963). *Manual for kit of reference tests for cognitive factors.* Princeton, NJ: Educational Testing Service.

Freud, A. (1936). *The Ego and the mechanisms of defense.* London: The Hogarth Press.

Freud, S. (1900). The interpretation of dreams. *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, 4, 5. London: The Hogarth Press.

Freud, S. (1914). On the history of the psycho-analytic movement. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 14, pp. 7-66. London: The Hogarth Press.

Freud, S. (1915a). Repression. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 14, pp. 143-158. London: The Hogarth Press.

Freud, S. (1915b). The unconscious. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 14, pp. 161-215. London: The Hogarth Press.

Freud, S. (1917). Introductory lectures on psycho-analysis. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 15, 16. London: The Hogarth Press.

Freud, S. (1929). Resistance and repression. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 16, Lecture XIX, pp. 286-302. London: The Hogarth Press.

Freud, S. (1933). New introductory lectures on psycho-analysis. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* Volume 22, Lecture XXXII, pp. 81-111. London: The Hogarth Press.

Freud, S. & Breuer, J. (1895). Studies on hysteria. *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* 2. London: The Hogarth Press.

Fritz, C.O., Morris, P.E., & Richler, J.J. (2012). Effect size estimates: Current use, calculations and interpretation. *Journal of Experimental Psychology: General, 141,* 2-18.

Geller, L. (1982). The failure of self-actualization theory: A critique of Carl Rogers and Abraham Maslow. *Journal of Humanistic Psychology, 22,* 56-73.

Ghauri, P. & Gronhaug, K. (2002). *Research methods in business studies: Practical guide.* Edinburgh: Pearson education limited.

Glass, D. (1964). Changes in liking as a means of reducing cognitive discrepancies between self-esteem and aggression. *Journal of Personality,* 32, 531-549.

Glass, G.V., Peckham, P.D. & Sanders, J.R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research, 42,* 237-288.

Gliner, J.A., Leech, N.L. & Morgan, G.A. (2002). Problems with null hypothesis significance testing (NHST): what do the textbooks say? *The Journal of Experimental Education, 71,* 83-92.

Goel, V. & Dolan, R.J. (2004). Differential involvement of left pre-fontal cortex in inductive and deductive reasoning. *Cognition, 93,* B109-B121.

Goel, V., Gold., B., Kapur, S. & Houle, S. (1997). The seats of reason: a localization study of deductive and inductive reasoning using PET (O15) blood flow technique. *Neuroreport, 8,* 1305-1310.

Gorunescu, F. (2011). *Data mining: concepts, models and techniques.* Berlin: Springer Verlag.

Gower, B. (1997). *Scientific method: A historical and philosophical introduction.* London: Routledge.

Graham, J.M., Guthrie, A.C. & Thompson, B. (2003). Consequences of not interpreting structure coefficients in published CFA research: a reminder. *Structural Equation Modeling, 10,* 142-153.

Grant, A.M. (2007). Relational job design and the motivation to make a prosocial difference. *Academy of Management Review, 32,* 393-417.

Grant, A.M. (2008). Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity. *Journal of Applied Psychology, 93,* 48-58.

Grant, A.M. & Berry, J. (2011). The necessity of others is the mother of invention: Intrinsic and prosocial motivations, perspective-taking, and creativity. *Academy of Management Journal, 54,* 73-96.

Grant, A.M. & Shin, J. (2012). Work motivation: directing, energizing, and maintaining effort (and research). In: Ryan, R.M. (Ed.), *The Oxford handbook of human motivation (pp. 505-519).* Oxford: Oxford University Press.

Green, S.B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioural Research, 26,* 499-510.

Guadagnoli, E. & Velicer, W. (1988). Relatio of sample size to the stability of component patterns. *Psychological Bulletin, 103,* 265-275.

Guest, D., Michie, J., Conway, N. & Sheehan, M. (2003). Human resource management and corporate performance in the UK. *British Journal of Industrial Relations, 41*, 291-314.

Guilford, J.P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.

Guion, R.M. (1958). Industrial morale: The problem of terminology. *Personnel Psychology, 11,* 59-64.

Gupta, S.L. (2003). *Marketing research* (1st edition). New Delhi: Excel Books.

Gupta, S.L. (2007). *Marketing research* (3rd edition). New Delhi: Excel Books.

Haack, S. (1976). The justification of deduction. *Mind: A Quarterly Review of Psychology and Philosophy, 85,* 112-119.

Hair, J.F., Wolfinbarger Celsi, M., Money, A.H., Samouel, P. & Page, M.J. (2011). *Essentials of business research methods.* New York: Sharpe.

Hakstian, A.R., Rogers, W.D., & Cattell, R.B. (1982). The behavior of numbers factors rules with simulated data. *Multivariate Behavioral Research, 17,* 193-219.

Hall, C.S. & Lindzey, G. (1957). *Theories of personality*. New York: Wiley.

Hall, D.T. & Nougaim, K.E. (1968). An examination of Maslow's need hierarchy in an organizational setting. *Organizational Behavior & Human Performance, 3*, 12-35.

Hammock, T. & Brehm, J.W. (1966). The attractiveness of choice alternatives when freedom to choose is eliminated by a social agent. *Journal of Personality, 34*, 546-554.

Haner, C.F. & Brown, J.S. (1955). Clarification of the instigation to action concept in the frustration-aggression hypothesis. *Journal of Abnormal and Social Psychology, 51*, 204-206.

Harlow, H.F. (1953). Mice, monkeys, men and motives. *Psychological Review, 60,* 23-32.

Harlow, H.F. (1958). The nature of love. *American Psychologist, 73,* 673-685.

Harlow, H.F. & Harlow, M.K. (1962). Social deprivation in monkeys. *Scientific American, 207* (5), 136-146.

Harlow, H.F. & Harlow, M.K. (1966). Learning to love. *American Scientist, 54,* 244-272.

Harlow, H.F. & Suomi, S.J. (1970). Nature of love-simplified. *American Psychologist, 25,* 161-168.

Harlow, H., Harlow, M.K. & Meyer, D.R. (1950). Learning motivated by a manipulation drive. *journal of Experimental Psychology, 40,* 228-234.

Harman, B.H. (1976). *Modern factor analysis*. Chicago: University of Chicago Press.

Harmon-Jones, E., Brehm, J.W., Greenberg, J., Simon, L. & Nelson, D.E. (1996). Evidence that the production of aversive consequences is not necessary to create cognitive dissonance. *Journal of Personality and Social Psychology, 70,* 5-16.

Harrell, T.W. (1949). *Industrial Psychology*. Oxford, UK: Rinehart.

Harris, R.J. (1975). *A primer of multivariate statistics.* New York: Academic.

Hays, W.L. (1994). *Statistics.* Fort Worth, TX: Harcourt Brace.

Hebb, D.O. (1955). Drives and the conceptual nervous system. *Psychological Review, 62,* 243-253.

Hebb, D.O. (1966). *A textbook of psychology* (2nd ed.). Philadelphia: W. B. Saunders.

Heider, F. (1944). Social perception and phenomenal causality. *Psychological Review,* 51, 358-374.

Heider, F. (1958). *The psychology of interpersonal relations.* New York: Wiley.

Heine, S.J. & Lehman, D.R. (1997). Culture, dissonance, and self-affirmation. *Personality and Social Psychology Bulletin, 23,* 389-400.

Heit, E. (2007). What is induction and why study it? In: A. Feeny, E. Heit (Eds). *Inductive Reasoning* (pp. 1-24). Cambridge: Cambridge University Press.

Heit, E. & Rotello, C.M. (2008). Modelling two kinds of reasoning. In: Sloutsky, V., Love, B. & McCrae, K. (Eds.) *Proceedings of the Thirtieth Annual Meeting of the Cognitive Science Society* (pp. 1831-1836). Austin, TX: Cognitive Science Society.

Heit, E. & Rotello, C.M. (2010). Relations between inductive reasoning and deductive reasoning. *Journal of Experimental Psychology: Learning, Memory and Cognition, 36,* 805-812.

Henle, M. (1944). The influence of valence on substitution. *Journal of Psychology, 17*, 11-19.

Heron, W. (1957). The pathology of boredom. *Scientific American, 196 (1),* 52-56.

Heron, W. (1961). Cognitive and physiological effects of perceptual isolation. In: P. Solomon et al. (Eds.), *Sensory deprivation.* Cambridge: Harvard University Press.

Higgins, E.T. (1997). Beyond pleasure and pain. *American Psychologist, 52,* 1280–1300.

Higgins, E.T. (2001). Promotion and prevention experiences: Relating emotions to nonemotional motivational states. In J.P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 186–211). London: Psychology Press.

Higgins, E.T. (2011). *Beyond pleasure and pain: How motivation works.* New York: Oxford University Press.

Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Ayduk, O. N., & Taylor, A. (2001). Achievement orientations from subjective histories of success: Promotion pride versus prevention pride. *European Journal of Social Psychology, 31,* 3–23.

Hinkin, T.R. (1995). A review of scale development practices in the study of organizations. *Journal of Management, 21,* 967-988.

Hinkin, T.R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods, 1,* 104-121.

Hiroto, D.S. & Seligman, M.E.P. (1975). Generality of learned helplessness in man. *Journal of Personality and Social Psychology, 31*, 311-327.

Hirsch, H.V.B. & Spinelli, D.N. (1970). Visual experience modifies distribution of horizontally and vertically oriented receptive fields in cats. *Science, 168,* 869-871.

Hirsch, H.V.B. & Spinelli, D.N. (1971). Modification of the distribution of receptive field orientation in cats by selective visual exposure during development. *Experimental Brain Research, 13,* 509-527.

Hokanson, J.E. (1969). *The physiological bases of motivation.* New York: Wiley.

Homans, G.C. (1941). The Western Electric researches. In: M. T. Matteson & J. M. Ivancevich (Eds.), *Management classics*. Santa Monica: Goodyear.

Houser, J.D. (1938). Measurement of the vital products of business. *Journal of Marketing, 2,* 181-189.

Howell, D.C. (2002). *Statistical methods for psychology*. Belmont, CA: Duxbury.

Hull, C.L. (1943). *Principles of behavior: An introduction to behavior theory.* New York: Appleton-Century-Crofts.

Hull, C.L. (1951). *Essentials of behavior.* New Haven: Yale University Press.

Hull, C.L. (1952). *A behavior system: An introduction to behavior theory concerning the individual organism.* New Haven: Yale University Press, 1952.

Hume, D. (1886). *A treatise of human nature.* In: T.H. Green & T.H Gose (Eds.), *The philosophical works*. Darmstadt: Scientia Verlag Aalen. Reprint 1964.

Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist.* London: Sage.

Jahn, J.A. (1951). Some Further Contributions to Guttman's Theory of Scale

Analysis. *American Sociological Review, 16,* 233-239.

James, W. (1884). What is an emotion? *Mind, 9,* 188-205. (Reprinted in: M. Arnold (Ed.), *The nature of emotion.* Baltimore, MD: Penguin, 1968)

James, W. (1890). The emotions. In: *Principles of Psychology.* New York: Dover Publications, 1950.

James, W. (1980). *Principles of psychology.* New York: Holt.

James, W. & Rotter, J.B. (1958). Partial and 100% reinforcement under chance and skill conditions. *Journal of Experimental Psychology, 55*, 397-403.

Johnson, C.R. & Field, C.A. (1993). Using fixed-effects model multivariate analysis of variance in marine biology and ecology. *Oceanography Marine Biology Annual Review, 31, 1*77-221.

Johnson, R.N. (1972). *Aggression in man and animals.* Philadelphia, P A: Saunders.

Jones, E.E. (1979). The rocky road from acts to dispositions. *American Psychologist, 34,* 107-117.

Jones, E.E. & Davis, K.E. (1965). From acts to dispositions: The attribution process in person perception. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2). New York: Academic Press.

Jones, E.E. & Nisbett, R. E. (1971). *The actor and the observer: divergent perceptions of the causes of behavior.* New York: General Learning Press.

Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20,* 141-151.

Kaiser, H.F. (1970). A second generation Little Jiffy. *Psychometrika , 35,* 401-416.

Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika, 39,* 31-36.

Kalat, J.W. (2001). *Biological psychology*. Belmont, CA: Wadsworth.

Kanfer, R. (1990). Motivation theory and industrial and organizational psychology. In: M.D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 75-130). Palo Alto, CA: Consulting Psychologists Press.

Kashima, Y., Siegal, M., Tanaka, K. & Kashima, E.S. (1992). Do people believe behaviours are consistent with attitudes? Towards a cultural psychology of attribution processes. *British Journal of Social Psychology, 31,* 111-124.

Kass, R.A. & Tinsley, H.E.A. (1979). Factor analysis. *Journal of Leisure Research, 11,* 120-138.

Kelley, H.H. (1967). Attribution theory in social psychology. In: D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15). Lincoln: University of Nebraska Press.

Kelley, H.H. (1971). *Attribution in social interaction.* Morristown: General Learning Press.

Kelley, H.H. (1972). Attribution in social interaction. In: E. E. Jones et al. (Eds.), *Attribution: Perceiving the causes of behavior.* Morristown: General Learning Press.

Kelley, H.H. (1973). The processes of causal attribution. *American Psychologist, 28,* 107-128.

Kelley, H., & Michela, I. (1980). Attribution theory and research. In: M. Rosenweig & L. Porter (Eds.), *Annual review of psychology* (Vol. 31). Palo Alto: Annual Reviews.

Kelly, G.A. (1958). Man's construction of his alternatives. In: G. Lindzey (Ed.), *Assessment of human motives*. New York: Grove Press.

Kelly, G.A. (1966). A summary statement of a cognitive-oriented comprehensive theory of behavior. In: J.C. Manusco (Ed.), *Readings for a cognitive theory of personality*. New York: Holt, Rinehart, & Winston, 1970.

Kenrick, D.T., Griskevicius, V., Neuberg, S.L. & Shaller, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Perspectives on Psychological Science, 5,* 292-314.

Kiesler, C.A. & Sakumara, J. (1966). A test of a model for commitment. *Journal of Personality and Social Psychology, 3*, 349-353.

Kirk, R.E. (1995). *Experimental design: Procedures for the behavioural sciences.* Pacific Grove, CA: Brookes/Cole.

Kirk, R.E. (1996). Practical significance: a concept whose time has come. *Educational and Psychological Measurement, 56,* 746-759.

Klassen, R.M. & Usher, E.L. (2010). Self-efficacy in educational settings: Recent research and emerging directions. In: T.C. Urdan & S.A. Karabenick (Eds.), *Advances in motivation and achievement. Volume 16A, the decade ahead: Theoretical perspectives on motivation and achievement (pp. 1-33).* Bingley, UK: Emerald Publishing Group.

Kleinginna, P.R. & Kleinginna, A.M. (1981). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion, 5*, 263-291.

Kline, P. (1999). *The handbook of psychological testing*. London: Routledge.

Kline, R. (2004). *Beyond significance testing: Reforming data analysis methods in behavioral research.* Washington, DC: American Psychological Association.

Klinger, E. (1966). Fantasy need achievement. *Psychological Bulletin, 66,* 291-306.

Klinger, E. (1975). Consequences of commitment to and disengagement from incentives. *Psychological Review, 82,* 1-25.

Klinger, E. (1977). *Meaning and void: Inner experience and the incentives in people's lives.* Minneapolis: University of Minnesota Press.

Korman, A.K. (1974). *The psychology of motivation.* Englewood Cliffs: Prentice Hall.

Korman, A.K., Greenhaus, J.H. & Badin, I.J. (1977). Personnel attitudes and motivation. *Annual Review of Psychology, 28,* 175-196.

Kuhn, T.S. (1962). *The structure of scientific revolutions*. Chicago, Ill.: University of Chicago Press.

Kyriacou, D.N. (2004). Evidence-based medical decision making: deductive versus inductive logical thinking. *Academic Emergency Medicine, 11,* 670-671.

Lachin, J.M. (1981). *Biostatistical methods: The assessment of relative risks*. New

York: Wiley.

Lange, M. (2011). Hume and the problem of induction. In: D.M. Gabbay, Hartmann, S. & Woods, J. (Eds.), *Handbook of the history of logic - Inductive logic (Vol. I0)*(pp. 43-91). Waltham, MA: North Holland Publications.

Latham, G.P. (2007). *Work motivation: History, theory, research and practice.* Thousand Oaks, CA: Sage.

Latham, G.P. & Locke, E.A. (2009). Science and ethics: What should count as evidence against the use of goal setting? *Academy of Management Perspectives, 23,* 88-91.

Latham, G.P., Locke, E.A. & Fassina, N.E. (2002). The high performance cycle: standing the test of time. In: S. Sonnentag (Ed.), *The psychological management of individual performance. A handbook in the psychology of Management organizations* (pp. 201-208). Chichester: Wiley.

Latham, G.P. & Pinder, C.C. (2005). Work motivation theory and research at the dawn of the twenty-first century. *Annual Review of Psychology, 56,* 485-516.

Lawler, E.E. (1965). *Managers' perceptions of their subordinates' pay and their superiors' pay. Personnel Psychology, 18,* 413-422.

Lawler, E.E. & Porter, L.W. (1967). The effect of performance on job satisfaction. *Industrial Relations*, 7*,* 20-28.

Lawson, R. (1965). *Frustration: The development of a scientific concept.* New York: Macmillan.

Lazarus, R.S. & Alfert, E. (1964). The short-circuiting of threat by experimentally altering cognitive appraisal. *Journal of Abnormal and Social Psychology, 69*, 195-205.

Lazarus, R.S. (1966). *Psychological stress and the coping process.* New York: McGraw-Hill.

Lazarus, R.S. (1975). Cognitive and coping processes in emotion. In: B. Weiner (Ed.), *Cognitive views of human motivation*. New York: Academic Press.

Lazarus, R.S., Opton, E.M., Jr., Nomikos, M.S. & Rankin, N.D. (1965). The principle of short-circuiting of threat: Further evidence. *Journal of Personality, 33*, 622-635.

Lefcourt, H.M. (1976). *Locus of control*. Hillsdale: Erlbaum Press.

Lehmann, E.L., & Romano, J.P. (2005). *Testing statistical hypotheses*. New York: Springer-Verlag.

Lenz, J. (1958). Problems for the practicalist's justification of induction. *Philosophical Studies, 9*, 4-8.

Lewin, K. (1935). *A dynamic theory of personality.* New York: McGraw-Hill.

Lewin, K. (1936). *Principles of topological psychology*. New York: McGraw-Hill.

Lewin, K. (1938). *The conceptual representation and the measurement of psychological forces.* Durham: Duke University Press.

Lewin, K. (1948). *Resolving social conflicts*. New York: Harper.

Lewin, K. (1951). *Field theory in social science: Selected theoretical papers.* New York: Harper.

Lewin, K., Dembo, T., Festinger, L. & Sears, P.S. (1944). Level of aspiration. In: J. M.V. Hunt (Ed.), *Personality and the behavior disorders* (Vol. 1, pp. 333-378). New York: Ronald Press.

Liebert, R.M. & Poulos, R.W. (1971). Eliciting the norm of giving: Effects of modeling and the presence of a witness on children's sharing behavior. *Proceedings of the 79th Annual Convention of the American Psychological Association, 6*, 345-346.

Liebert, R.M. & Spiegler, M.D. (1974). *Personality: Strategies for the study of man.* Homewood: Dorsey.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 140,* 55.

Lindberg, D.C. (2007). *The Beginnings of Western Science: The European scientific tradition in philosophical, religious, and institutional context.* Chicago, Ill.: The University of Chicago Press.

Lindman, H.R. (1974). *Analysis of variance in complex experimental designs.* San Francisco, CA: W.H. Freeman.

Lindsley, D. (1950). Emotions and the electro encephalogram. In: M. L. Reymert (Ed.), *Feelings and emotions.* New York: McGraw-Hill.

Lindsley, D. (1951). Emotion. In: S.S. Stevens (Ed.), *Handbook of experimental psychology.* New York: Wiley.

Lissner, K. (1933). Die entspannung von bedürfnissen durch ersatzhandlungen. *Psychologische Forschung, 18*, 218-250.

Litwin, G.H. (1958). Motives and expectancies as determinants of preference for degrees of risk. In: J.W. Atkinson & N.T. Feather (Eds.), *A theory of achievement motivation*. New York: Wiley.

Locke, E.A. & Latham, G.P. (1990). *A theory of goal-setting and task performance.* Englewood Cliffs, NJ: Prentice Hall.

Locke, E.A. & Latham, G.P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57,* 705-717.

Locke, E.A. & Latham, G.P. (2004). What should we do about motivation theory? Six recommendations for the twenty-first century. *Academy of Management Review, 29,* 388-403.

Locke, E.A. & Latham, G.P. (2009). Has goal setting gone wild, or have its attackers abandoned good scholarship? *Academy of Management Perspectives, 23,* 17-23.

Logan, F. A. (1968). Incentive theory and changes in reward. In: K.W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation* (Vol. 2). New York: Academic Press.

Lorenz, K. (1950). The comparative method of studying innate behavior patterns. In: *Symposia of the Society of Experimental Biology.* Cambridge: Cambridge University Press.

Lorenz, K. (1967). *On aggression.* New York: Bantam.

Lorenz, K. (1970). The establishment of the instinct concept. In: *Studies in animal and human behavior* (Vol 1) (Robert Martin, Trans.). Cambridge: Harvard University Press.

Mace, C.A. (1935). *Incentives: Some experimental studies* {Report No. 72). London: Industrial Health Residency Board.

MacKenzie, S.B., Podsakoff, P.M. & Podsakoff, N.P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly, 35,* 293-334.

Mahrer, A. R. (1956). The role of expectancy in delayed reinforcement. *Journal of Experimental Psychology, 52*, 101-105.

Maier, N.R.F. (1946). *Psychology in industry*. Boston: Houghton Mifflin.

Mandela, N.R. (2013). *Long walk to freedom.* London: Abacus. Reprint of the 1964 edition.

Maracek, J., & Mettee, D. (1972). Avoidance of continued success as a function of self-esteem, level of esteem certainty, and responsibility for success. *Journal of Personality and Social Psychology, 22,* 98-107.

Marler, P. (1975). On animal aggression. *American Psychologist, 31*, 239-246.

Marrow, A.J. (1938). Goal tensions and recall: I. *Journal of General Psychology, 19*, 3-35.

Maslow, A.H. (1943). A theory of motivation. *Psychological Review, 50,* 370-96.

Maslow, A.H. (1954). *Motivation and personality*. New York: Harper & Row.

Maslow, A.H. (1959). *New knowledge in human values.* New Y ark: Harper & Row.

Maslow, A.H. (1971). *The farther reaches of human nature.* New York: Viking.

Maslow, A.H. (1973). Self-actualizing people: A study of psychological health. In: R.J. Lowry (Ed.), *Dominance, self-esteem, self-actualization: Germinal papers of A.H. Maslow.* Monterey: Brooks Cole.

Maslow, A.H. (1973). Theory of human motivation. In: R.J. Lowry (Ed.), *Dominance ,self-esteem, self-actualization: Germinal papers of A. H. Maslow.* Monterey: Brooks Cole.

Masters, W.H. & Johnson, V.E. (1966). *Human sexual response.* Boston: Little, Brown.

Masters, W.H. & Johnson, V.E. (1970). *Human sexual inadequacy.* Boston: Little, Brown.

Masters, W.H. & Johnson, V.E. (1974). *The pleasure bond: A new look at sexuality and commitment.* Boston: Little, Brown.

Matson, J.L. & Boisjoli, J.A. (2009). The token economy for children with intellectual disability and/or autism: A review. *Research in Developmental Disabilities, 30,* 240-248 .

Maxwell, S.E., & Delany, H.D. (2004). *Designing experiments and analyzing data:*

A model comparison perspective. Mahwah, NJ: Lawrence Erlbaum Associated Publishers.

Mayo, E. (1933). *The human problems of an industrial civilization.* New York: Macmillan.

Mazis, M.B. (1975). Antipollution measures and psychological reactance theory: A field experiment. *Journal of Personality and Social Psychology, 31*, 654-660.

McClelland, D.C., Atkinson,. W., Clark, R.A. & Lowell, E.L. (1953). *The achievement motive.* New York: Appleton-Century-Crofts.

McDougall, W. (1923). *Outline of psychology*. New York: Scribner.

McDougall, W. (1970). The nature of instincts and their place in the constitution of the human mind. In: W.A. Russell (Ed.), *Milestones in motivation.* New York: Appleton-Century-Crofts.

McGregor, D.M. (1957). The human side of enterprise. *Management Review, 46,* 22-28.

McGregor, D.M. (1960). *The human side of enterprise.* New York: McGraw-Hill.

McNabb, D.E. (2010). *Research methods for political science: Quantitative and qualitative approaches.* New York: Sharpe.

Metzger, R., Cotton, J.W. & Lewis, D.J. (1957). Effect of reinforcement magnitude and order of presentation of different magnitudes on runway behavior. J*ournal of Comparative and Physiological Psychology, 50,* 184-188.

Meyer, W.U., Folkes, V.S. & Weiner, B. (1976). The perceived informational value and affective consequences of choice behavior and intermediate difficulty task selection. *Journal of Research in Personality, 10*, 410-423.

Miles, J. & Shevlin, M. (2001). *Applying regression and correlation: a guide for students and researchers.* London: Sage.

Milgram, S. (1963). Behavioral study of obedience. *journal of Abnormal and Social Psychology, 67,* 371-378.

Milgram, S. (1964). Group pressure and action against a person. *Journal of Abnormal and Social Psychology, 69*, 137-143.

Milgram, S. (1965). Liberating effects of group pressure. *Journal of Personality and Social Psychology*, *1*, 127-134.

Milgram, S. (1974). *Obedience to authority.* New York: Harper & Row.

Mill, J.S. (1973). *A system of logic, ratiocinative and inductive*. In: J.M. Robson and R.F. Mc Rae (Eds.), *Collected works of John Stuart Mill* (vol. 7-8). Toronto: University of Toronto Press.

Miller, N.E. (1944). Experimental studies of conflict. In: J. McV. Hunt (Ed.), *Personality and the behavioral disorders* (Vol. 1). New York: Ronald.

Miller, N.E. (1948). Studies of fear as an acquirable drive: I. Fear as motivation and fear-reduction as reinforcement in the learning of new responses. *Journal of Experimental Psychology, 38,* 89-101.

Miller, N.E. (1959). Liberalization of basic S-R concepts: Extensions to conflict

behavior, motivation, and social learning. In: S. Koch (Ed.), *Psychology: A study of a science* (Vol. 2). New York: McGraw-Hill.

Miller, N.E. (1963). Some reflections on the law of effect produce a new alternative to drive reduction. In: M.R. Jones (Ed.), *Nebraska symposium on motivation.* Lincoln: University of Nebraska Press.

Milton, J.R. (1987). Induction before Hume. *The British Journal for the Philosophy of Science, 38,* 49-74.

Milton, J.R. (2011). Induction before Hume. In: D. M. Gabbay, Hartmann, S. & Woods, J. (Eds.), *Handbook of the history of logic - Inductive logic (Vol. I0)* (pp. 1-41). Waltham, MA: North Holland Publications.

Mineka, S. & Suomi, S.J. *(*1978). Social separation in monkeys. *Psychological Bulletin, 85,* 1376-1400.

Mineka, S., Suomi, S.J. & Delizio, R. (1981). Multiple separations in adolescent monkeys: An opponent-process interpretation. *Journal of Experimental Psychology: General,* 110,56-85.

Mischel, W. (1968). *Personality and assessment.* New York: Wiley.

Mischel, W. (1973). Towards a cognitive social learning reconceptualization of personality. *Psychological Review, 80,* 252-283.

Mischel, W. (1976). *Introduction to personality* (2nd ed.). New York: Holt, Rinehart, & Winston.

Moltz, H. (1965). Contemporary instinct theory and the fixed action pattern. *Psychological Review, 72,* 27-47.

Monson, T.C. & Snyder, M. (1977). Actors, observers, and the attribution process: Toward a reconceptualization. *Journal of Experimental Social Psychology, 13*, 89-111.

Molden, D., & Higgins, E. (2004). Categorization under uncertainty: Resolving vagueness and ambiguity with eager versus vigilant strategies. *Social Cognition, 22,* 248–277.

Molden, D., & Higgins, E. (2008). How preferences for eager versus vigilant judgment strategies affect self-serving conclusions. *Journal of Experimental Social Psychology, 44,* 1219–1228.

Montgomery, K.C. (1953). Exploratory behavior as a function of "similarity" of stimulus situations. *Journal of Comparative and Physiological Psychology, 46,* 129-133.

Morgan, C.T. (1943). *Physiological Psychology.* New York: McGraw-Hill.

Morrison, D.F. (1967). *Multivariate statistical methods* (1st edition). New York: McGraw-Hill.

Morrison, D.F. (2003). *Multivariate statistical methods* (4th edition). New York: McGraw-Hill.

Moruzzi, G. & Magoun, H.W. (1949). Brain stem reticular formation and activation of the EEG. *Electroencephalography and Clinical Neurophysiology, 1,* 455-473.

Moulton, R.W. (1965). Effects of success and failure on level of aspiration as

related to achievement motives. *Journal of Personality and Social Psychology, 1*, 399-406.

Mowrer, O.H. (1947). On the dual nature of learning: A reinterpretation of "conditioning" and "problem solving." *Harvard Educational Review, 17,* 102-148.

Mowrer, O.H. (1960). *Learning theory and behavior.* New York: Wiley.

Multon, K.D., Brown, S.D. & Lent, R.W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology, 38,* 30-38.

Murray, E.J. & Berkun, M.M. (1955). Displacement as a function of conflict. *Journal of Abnormal and Social Psychology, 51*, 47-56.

Murray, H.A. (1938). *Explorations in personality.* New York: Oxford University Press.

Myers, R. (1990). *Classical and modern regression with applications*. Boston, MA: Duxbury.

Nisbett, R.E. & Valens, S. (1972). Perceiving the causes of one's own behavior. In: E.E. Jones et al. (Eds.), *Attribution: Perceiving the causes of behavior.* Morristown: General Learning Press.

Norusis, M.J. (1990). *SPSS/PC+ Statistics 4.0*. Chicago, Ill.: SPSS Inc.

Nunnally, J.C. (1978). *Psychometric theory*. New York: McGraw-Hill.

Nunnally, J.C. & Bernstein, I.H. (1994). *Psychometric theory* (3rd edition). New York: McGraw-Hill.

Nuttin, J.R. (1973). Pleasure and reward in motivation and learning. In: D. Berlyne (Ed.), *Pleasure, reward, preference*. New York: Academic Press.

Olson, C. (1974). Comparative robustness of six tests in multivariate analysis of variance. *Journal of the American Statistical Association, 69,* 894-908.

Olson, C. (1976). On choosing a test statistic in multivariate analysis of variance. *Psychological Bulletin, 83,* 579-586.

Ordoñez, L.D., Schweitzer, M.E., Galinsky, A.D. & Bazerman, M.H. (2009a). Goals gone wild: The systematic side effects of overprescribing goal setting. *Academy of Management Perspectives, 23,* 6-22.

Ordoñez, L.D., Schweitzer, M.E., Galinsky, A.D. & Bazerman, M.H. (2009b). On good scholarship, goal setting, and scholars gone wild. *Academy of Management Perspective, 23,* 82-87.

O'Reilly, C.A. (1991). Organizational behavior: Where we've been, where we're going. *Annual Review of Psychology, 42*, 427-458.

Osherson, D., Perani, D., Cappa, S., Schnur, T., Grassi, F. & Fazio, F. (1998). Distinct brain loci in deductive versus probabilistic reasoning. *Neuropsychologia, 36*, 369-376.

Overmier, J.B. & Lawry, J.A. (1979). Pavlovian conditioning and the mediation of behavior. In: G.H. Bower (Ed.), The *psychology of learning and motivation* (Vol. *13*).

New York: Academic Press.

Ovsiankina, M. Die Wiederaufnahme von unterbrochener Handlungen. *Psychologische Forschung* 1928, *11,* 302-379.

Panksepp, J. & Trowill, J. (1971). Positive and negative contrast in licking with shifts in sucrose concentration as a function of food deprivation. *Learning and Motivation, 2,* 49-57.

Parsons, L.M. & Osherson, D. (2001). New evidence for distinct right and left brain systems for deductive versus probabilistic reasoning. *Cereb Cortex, 11,* 954-965.

Pavlov, I.P. (1960). *Conditioned reflexes.* New York: Dover.

Pepitone, A. (1966). Problems of consistency models. In: S. Feldman (Ed.), *Cognitive consistency.* New York: Academic Press.

Perin, C.T. Behavior potentiality as a joint function of the amount of training and the degree of hunger at the time of extinction. *journal of Experimental Psychology,* 1942, *30,* 93-113.

Petri, H.L. & Govern, J.M. (2013). *Motivation, theory, research and application.* Belmont, CA: Wadsworth Cengage Learning.

Phares, E.J. (1957). Expectancy changes in skill and chance situations. *Journal of Abnormal and Social Psychology, 54*, 339-342.

Phares, E.J. (1976). *Locus of control in personality*. Morristown: General Learning Press.

Plotnikoff, R.C., Lippke, S., Courneya, K.S., Birkett, N. & Sigal, R.J. (2008). Physical activity and social cognitive theory: A test in a population sample of adults with Type 1 or Type 2 diabetes. *Applied Psychology: An International Review, 57,* 6

Popper, K.R. (1935). *Logik der forschung.* Vienna, Austria: Springer Verlag.

Popper, K.R. (1959). *The logic of scientific discovery.* New York, NY: Basic Books.

Popper, K.R. (1963). *Conjectures and refutations: The growth of scientific knowledge*. London: Routledge.

Popper, K.R. (2002). *The logic of scientific discovery.* New York, NY: Basic Books. Reprint of the 1959 English edition.

Porter, L.W. & Lawler, E.E., III (1968). *Managerial attitudes and performance.* Home· wood, IL: Dorsey.

Powers, W. T. (1973). *Behavior: The control of perception.* Chicago, IL: Aldine.

Privette, G. (1983). Peak experience, peak performance, and flow: A comparative analysis of positive human experiences. *Journal of Personality and Social Psychology, 45,* 1361-1368.

Ramirez, J., Bryant, J. & Zillmann, D. (1982). Effects of erotica on retaliatory behavior as a function of level of prior provocation. *Journal of Personality and Soda! Psychology, 43,* 971-978.

Rapaport, D. (1942). *Emotions and memory*. Baltimore: Williams & Wilkins.

Reeve, J. (2005). *Understanding motivation and emotion.* New York: John Wiley &

Sons.

Reichenbach, H. (1944). *The theory of probability.* Berkeley: University of California Press.

Rescher, N. (1980). *Induction: An essay on the justification of inductive reasoning.* Pittsburgh, PA: University of Pittsburg Press.

Rhodewalt, F. & Agustsdottir, S. (1986). Effects of self-presentation on the phenomenal self. *Journal of Personality and Social Psychology, 50*, 47-55.

Riesen, A. H. (1961). Excessive arousal effects of stimulation after early sensory deprivation. In: P. Solomon et al. (Eds.), *Sensory deprivation.* Cambridge: Harvard University Press.

Rips, L.J. (1994). *The Psychology of Proof: Deductive Reasoning in Human Thinking.* Cambridge, MA: MIT Press.

Roethlisberger, F.J. (1977). *The elusive phenomena.* Cambridge, MA: Harvard University Press.

Roethlisberger, F.J. & Dickson, W.J. (1939). *Management and the worker.* Cambridge, MA: Harvard University Press.

Rogers, C.R. (1951). *Client-centered therapy: Its current practice, implication, and theory.* Boston: Houghton Mifflin.

Rogers, C.R. (1959). A theory of therapy, personality, and interpersonal relationships, as developed in the clientcentered framework. In: S. Koch (Ed.), *Psychology: A study of a science. Study 1: Conceptual and systematic: Vol. 3. Formulations*

Rogers, C.R. (1961). *On becoming a person: A therapist's view of psychotherapy.* Boston: Houghton Mifflin.

Rogers, C.R. (1963). Actualizing tendency in relation to "motives" and to consciousness. In: M.R. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln: University of Nebraska Press.

Rosenbaum, P.R (2002). *Observational Studies*. New York: Springer-Verlag.

Rosenthal, R. (1994). Parametric measures of effect size. In: H. Cooper & L.V. Hedges (Eds.) *The handbook of research synthesis (pp. 231-244).* New York: Russel Sage Foundation.

Rosenzweig, S. (1943). An experimental study of "repression" with special reference to need-persistive and ego-defensive reactions to frustration. *Journal of Experimental Psychology, 32*, 64-74.

Rosnow, R.L. & Rosenthal, R. (1989). Statistical procedures and the justification of knowledge in psychological science. *American Psychologist, 44,* 1276-1284.

Rosnow, R.L. & Rosenthal, R. (2005). *Beginning behavioural research: a conceptual primer*. Englewood Cliffs, NJ: Pearson/Prentice Hall.

Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10). New York: Academic Press.

Ross, R.R. (1964). Positive and negative partial-reinforcement extinction effects carried through continuous reinforcement, changed motivation and changed response. *Journal of Experimental Psychology, 68,* 492-502.

Rotello, C.M. & Heit, E. (2009). Modeling the effects of argument length and validity on inductive and deductive reasoning. *Journal of Experimental Psychology: Learning, Memory and Cognition, 35,* 1317-1330.

Roth, S. & Kubal, L. (1975). The effects of noncontingent reinforcement on tasks of differing importance: Facilitation and learned helplessness. *Journal of Personality and Social Psychology*, *32*, 680-691.

Rotter, J.B. (1954). *Social learning and clinical psychology.* Englewood Cliffs: Prentice Hall.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, 1-28.

Rotter, J.B. (1972). An introduction to social learning theory. In: J.B. Rotter, J.E. Chance & E.J. Phares (Eds.), *Applications of social learning theory of personality*. New York: Holt, Rinehart, & Winston.

Rotter, J.B. & Hochreich, D.J. (1975). *Personality*. Glenview: Scott Foresman.

Russell, B. (1989). *A history of Western philosophy and its connection with political and social circumstances from the earliest times to the present day.* London: Unwin Hyman Ltd. First published 1946.

Rutherford, A. (2001). *Introducing ANOVA and ANCOVA: a GLM Approach.* London: Sage Publications.

Ryan, R.M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evalution theory. *Journal of Personality and Social Psychology, 43*, 450-461.

Ryan, R.M., Kuhl, J. & Deci, E.L. (1997). Nature and autonomy: Organizational view of social and neurobiological aspects of self-regulation in behavior and development. *Development and Psychopathology, 9,* 701-728.

Ryan, R.M. & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55,* 68-78.

Ryan, R.M. & Deci, E.L. (2002). An overview of self-determination theory. In: E.L. Deci, & R.M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33) Rochester: University of Rochester Press.

Ryan, R.M. & LaGuardia, J.G. (2000). What is being optimized? Self-determination theory and basic psychological needs. In: S. H. Qualls & N. Abeles (Eds.), *Psychology and the aging revolution: How we adapt to longer life.* Washington: American Psychological Association.

Ryan, R.M., Stiller,].D. & Lynch,].H. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and selfesteem. *Journal of Early Adolescence, 14,* 226-249.

Ryan, T.A. & Smith, P.C. (1954). *Principles of industrial psychology*. New York:

Ronald Press.

Ryan, T.A. (1947). *Work and Effort: The psychology of production*. New York: Ronald Press.

Sackett, G.P. (1967). Some persistent effects of different rearing conditions on preadult social behavior of monkeys. J*ournal of Comparative and Physiological Psychology, 64,* 363-365.

Sadri, G. & Robertson, I.T. (1993). Self-efficacy and work-related behavior: a review and meta-analysis. *Applied Psychology: An International Review, 42,* 139-152.

Salkind, N.J. (2010)(Ed.). *Encyclopedia of Research Design*. Thousand Oaks, CA: Sage.

Salmon, W.C. (1963). *Logic.* Englewood Cliffs, NJ: Prentice Hall.

Salmon, W.C. (1967). *The foundations of scientific inference*. Pittsburg, PA: University of Pittsburgh Press.

Salmon, W.C. (1957). Should we attempt to justify induction? *Philosophical Studies, 8, 33-48.*

Samanta, R.K. (1993). *Training Methods for Management and Development.* New Delhi: MD Publications.

Sanford, N. (1956). The approach of the authoritarian personality. In: J.L. McCary (Ed.), *Psychology of personality: Six modern approaches*. New York: Logos.

Sankey, H. (2013). Scientific Method. In: M. Curd & S. Psillos (Eds.), *Routledge Companion to Philosophy of Science (pp. 280-290).* New York: Routledge.

Schachter, S. (1964). The interaction of cognitive and physiological determinants of emotional state. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. *1,* pp. 49-80). New York: Academic Press.

Schachter, S., & Singer, J.E. (1962). Cognitive, social, and physiological determinants of emotional states. *Psychological*

Schmidt, F.L. (1996). Statistical significance testing and cumulative knowledge in psychology: implications for the training of researchers. *Psychological Methods, 1,* 115-129.

Scholer, A. A., & Higgins, E. T. (2008). Distinguishing levels of approach and avoidance: An analysis using regulatory focus theory. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation (pp. 489–503).* New York: Psychology Press.

Schultz, D. (1977). *Growth psychology: Models of the healthy personality.* New York: Van Nostrand.

Schumacker, R.E. & Lomax, R.G. (1996). *A beginner's guide to structural equation modeling.* Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Schunk, D.H. & Pajares, F. (2009). Self-efficacy theory. In: K.R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school (pp. 35-53).* New York: Routledge.

Schunk, D.H. & Usher, E.L. (2012). Social cognitive theory and motivation. In: Ryan, R.M. (Ed.), *The Oxford handbook of human motivation (pp. 13-27).* Oxford:

Oxford University Press.

Scott, J. (2000). Rational choice theory. In: G. Browning, A. Haleli, & F. Webster (Eds), *Understanding contemporary society: theories of the present (pp. 126-138).* London: Sage.

Sears, R.R. (1942). *Success and failure: A study of motility*. New York: McGraw-Hill.

Seeman, M. & Evans, J.W. (1962). Alienation and social learning in a hospital setting. *American Sociological Review*, 27, 772-783.

Seeman, M. (1933). Alienation and social learning in reformatory. *American Journal of Sociology, 69*, 270-284.

Seligman, M.E.P. (1975). *Helplessness: On depression, development, and death.* San Francisco: Freeman.

Seligman, M.E.P. & Maier, S.F. (1967). Failure to escape traumatic shock. *Journal of Experimental Psychology, 74,* 1-9.

Selvin, H.C. & Stuart, A. (1966). Data-dredging procedures in survey analysis. *The American Statistician, 20,* 20-23.

Shadish, W.R., Cook, T.D. & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston: Houghton Mifflin Company.

Shah, J.Y., Friedman, R. & Kruglanski, A.W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83,* 1261–1280.

Shah, J.Y, & Higgins, E.T. (2001). Regulatory concerns and appraisal efficiency: The general impact of promotion and prevention. *Journal of Personality and Social Psychology, 80,* 693–705.

Shah, J.Y. & Kruglanski, A.W. (2000). The structure and substance of intrinsic motivation. In: C. Sansone, & J.M. Harackiewicz (Eds.), *Intrinsic motivation: Controversies and new directions (pp. 105-127)*. San Diego: Academic.

Shah, J.Y., Kruglanski, A.W., Friedman, R., Spencer, S.J., Fein, S. & Zanna, M.P. (2003). Goal systems theory: Integrating the cognitive and motivational aspects of self-regulation. *Motivated Social Perception: The Ontario Symposium, 9,* 247-275.

Sharma, R.N., & Chandra, S.S. (2003). *Advanced educational technology.* New Delhi: Atlantic Publishers.

Sharma, R.N. & Chandra, S.S. (2008). *Advanced educational technology.* New Delhi: Atlantic Publishers & Distributors.

Shaugnessy, J.J., Zechmeister, E.B. & Zechmeister, J.S. (2005). *Research methods in psychology*. New York: McGraw-Hill.

Sheldon, K.M., Elliot, A.J., Kim, Y. & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80,* 325-339.

Sheppard, B.H., Hartwick, J. & Warshaw, P.R. (1988). The theory of reasoned

action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research, 15,* 325-343.

Shostrom, E. (1964). An inventory for the measurement of self-actualization. *Educational and Psychological Measurement, 24,* 207-216.

Shostrom, E.L. (1966). *Manual for the personal orientation inventory.* San Diego: Educational and Industrial Testing Service.

Siegel, S., & Castellan, N.J. (1988). *Nonparametric statistics for the behavioral sciences.* New York: McGraw-Hill.

Silva, M.N., Marques, M. & Teixeira, P.J. (2014). Testing theory in practice: The example of self-determination theory-based interventions. *The European Health Psychologist, 16,* 171-180.

Silver, L., Stevens, R.E., Wrenn, B. & Loudon, D.L. (2012). *The essentials of marketing research.* New York: Routledge.

Simkin, C. (1993). *Popper's views on natural and social science*. Leiden: Brill.

Simmons, R. (1924). The relative effectiveness of certain incentives in animal learning. *Comparative Psychology Monographs,* 2, 1-79.

Singer, J.E. (1966). Motivation for consistency. In: S. Feldman (Ed.), *Cognitive consistency:Motivational antecedents and behavioral consequents.* New York: Academic Press.

Skinner, B.F. (1938). *The behavior of organisms: An experimental analysis.* New York: Appleton-Century-Crofts.

Skyrms, B (1975). *Choice and chance: an introduction to inductive logic.* Encino, CA: Dickenson Publishing Company.

Slocum, J.W., & Hellriegel, D. (2010). *Principles of organizational behavior.* Boston: Cengage Learning.

Snyder, P., & Lawson, S. (1993). Evaluating results using corrected and uncorrected effect size estimates. *Journal of Experimental Education, 61,* 334-349.

Solomon, R.L. (1977). An opponent-process theory of motivation: V. Affective dynamics of eating. In: L.M. Barker, M. R. Best, & M. Domjan (Eds.), *Learning mechanisms in food selection.* Dallas: Baylor University Press.

Solomon, R.L. (1980). The opponent-process theory of acquired motivation: The costs of pleasure and the benefits of pain. A*merican Psychologist, 35,* 691-712.

Solomon, R.L., & Corbit, J.D. (1974). An opponent-process theory of motivation. *Psychological Review, 81,* 119-145.

Spence, K.W. (1956). *Behavior theory and conditioning.* New Haven: Yale University Press.

Spence, K.W. (1960). *Behavior theory and learning.* Englewood Cliffs: Prentice Hall.

Spence, K.W. & Taylor, J.A. (1951). Anxiety and strength of the US as a determinant of the amount of eyelid conditioning. *Journal of Experimental Psychology,*

42, 183-188.

Spence, K.W., Farber, I.E. & McFann, H.H. (1956). The relation of anxiety (drive) level of performance in competitional and non-competitional paired-associates learning. *Journal of Experimental Psychology*, *52*, 296-305.

Spence, K.W., Taylor, J.A. & Ketchel, R. (1956). Anxiety (drive) level and degree of competition in paired-associates learning. *Journal of Experimental Psychology*, *52*, 306-310.

Stagner, R. (1958). Industrial morale: II. Motivational aspects of industrial morale. *Personnel Psychology, 11*, 64-70.

Stajkovic, A.D. & Luthans, F. (1998). Self-efficacy and work-related performances: A meta-analysis. *Psychological Bulletin, 124,* 240-261.

Star, J. (2003). *Lao Tzu: Tao te ching – The definitive edition.* New York: Jeremy P. Tarcher/Putnam.

Steel, P. & König, C.J. (2006). Integrating theories of motivation. *Academy of Management Review, 31,* 889-913.

Steele, C.M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 261-302). San Diego: Academic Press.

Steele, C.M. & Liu, T.J. (1983). Dissonance processes as self-affirmation. *Journal of Personality and Social Psychology, 45,* 5-19.

Steele, C.M., Spencer, S.J., & Lynch, M. (1993). Dissonance and affirmational resources: Resilience against self-image threats. *Journal of Personality and Social Psychology, 64*, 885-896.

Steers, R.M. (2001). Call for papers. AMR special topic forum – The future of work motivation theory. *Academy of Management Review, 26,* 686-687.

Sternberg, R.J. & Gardner M.K. (1983). Unities in inductive reasoning. *Journal of Experimental Psycology: General, 112,* 80-116.

Steuer, F.B., Applefield, J.M. & Smith, R. (1971). Televised aggression and the interpersonal aggression of preschool children. *Journal of Experimental Child Psychology*, *11*, 442-447.

Stevens, J.P. (1979). Comment on Olson: Choosing a test statistic in multivariate analysis of variance. *Psychological Bulletin, 86,* 355-360.

Stevens, J.P. (1992). *Applied multivariate statistics for the social sciences* (2nd edition). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Stevens, J.P. (2002). *Applied multivariate statistics for the social sciences* (4th edition). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Stevens, R.E., Loudon, D.L., Ruddick, M.E., Wrenn, B. & Sherwood, P.K. (2006). *The marketing research guide.* New York: Routledge.

Stevens, R.E., Wrenn, B., Sherwood, P.K., & Ruddick, M.E. (2008). *The marketing research guide.* New York: Routledge.

Stone, J. & Cooper, J. (2000). A self-standards model of cognitive dissonance. *Journal of Experimental Social Psychology, 37* (3), 228-243.

Stouffer, S.A., Guttman, L., Suchman, E.A., Lazarsfeld, P.F., Star, S.A., Clausen, J.A. (1950). *Measurement and prediction.* Princeton, NJ: Princeton University Press.

Strodtbeck, F.L., McDonald, M.R. & Rosen, B. (1957). Evaluations of occupations: A reflection of Jewish and Italian mobility differences. *American Sociological Review*, *22*, 546-533.

Suedfeld, P. (1975). The benefits of boredom: Sensory deprivation reconsidered. *American Scientist, 63,* 60-69.

Suedfeld, P. & Coren, S. (1989). Perceptual isolation, sensory deprivation, and rest: Moving introductory psychology texts out of the 1950s. *Canadian Psychology,* 30, 17-29.

Suedfeld, P. & Kristeller, J.L. (1982). Stimulus reduction as a technique in health psychology. *Health Psychology, 1,* 337-357.

Suhr, D.D. (2006). Exploratory or confirmatory factor analysis? *Statistics and Data Analysis, Paper 200-31.* University of Northern Colorado.

Suppe, F. (1977). *The structure of scientific theories*. Chicago, IL: University of Illinois Press.

Suppe, F. (1989). *The semantic conception of theories and scientific realism*. Chicago, IL: University of Illinois Press.

Tabachnick, B.G. & Fidell, L.S. (1996). *Using multivariate statistics* (1st edition). New York: Pearson.

Tabachnick, B.G. & Fidell, L.S. (2001). *Using multivariate statistics* (4th edition). New York: Harper Collins.

Tabachnick, B.G. & Fidell, L.S. (2007). *Using multivariate statistics* (5th edition). New York: Pearson.

Tan, W.Y. (1982). Sampling distributions and robustness of *t, F* and variance-ratio in two samples and ANOVA models with respect to departure from normality. *Communications in Statistics - Theory and Methods, 11,* 486-511.

Tanguma, J. (1999). Repeated measures: A primer. In: B. Thompson (Ed.) *Advances in social science methodology* (vol. 5, pp. 233-250). Stanford, CT: JAI Press.

Taylor, F.W. (1911). *Principles of scientific management.* New York: Harper.

Taylor, J.A. & Chapman, J.P. (1955). Anxiety and the learning of paired-associates. *American Journal of Psychology, 68*, 671.

Thibodeau, R. & Aronson, E. (1992). Taking a closer look: Reasserting the role of the self-concept in dissonance theory. *Personality and Social Psychology Bulletin, 18* (5), 591-602.

Thompson, W.R. & Melzack, R. (1956). Early environment. *Scientific American, 194* (1), 38-42.

Thorndike, E.L. (1911). *Animal intelligence*. New York: Macmillan.

Thorndike, E.L. (1913). *Educational psychology: The psychology of learning* (Vol.

2). New York: Teachers College Press.

Thorndike, E.L. (1917). The curve of work and the curve of satisfyingness. *Journal of Applied Psychology, 1,* 265-267.

Thornton, S. (2014). Karl Popper. In: E.N. Zalta (Ed.) *The Stanford Encyclopedia of Philosophy.* Retrieved from http://plato.stanford.edu/archives/sum2014/entries/popper/>.

Thurstone, L.L. (1938). Primary mental abilities. *Psychometric Monographs (No. 1.).* Chicago: University of Chicago Press.

Thurstone, L.L. (1929). Theory of attitude measurement. *Psychological Review, 36,* 222-241.

Tinbergen, N. (1952). Derived activities: Their causation, biological significance, and origin and emancipation during evolution. *Quarterly Review of Biology*, *27*, 1-32.

Tolman, E.C. (1932). *Purposive behavior in animals and men.* New· York: Appleton-CenturyCrofts.

Tolman, E.C. (1959). Principles of purposive behavior. InS. Koch (Ed.), *Psychology: Astudy of a science* (Vol. 2). New York: McGraw-Hill.

Tolman, E.C. & Honzik, C.H. (1930). Introduction and removal of reward, and maze performance in rats. *University of California Publications in Psychology, 4,* 257-275.

Tomarken, A.J., & Serlin, R.C. (1986). Comparison of ANOVA alternatives under variance heterogeneity and specific noncentrality structures. *Psychology Bulletin, 99,* 90-99.

Trapold, M.A. & Overmier, J.B. (1972). The second learning process in instrumental learning. In: A.H. Black & W.F. Prokasy (Eds.), *Classical conditioning 11: Current research and theory.* New York: Appleton-Century-Crofts.

Twenge, J.M., Campbell, S.M., Hoffman, B.J., & Lance, C.E. (2010). Generational differences in work values: Leisure and extrinsic values increasing, social and intrinsic values decreasing. *Journal of Management, 36,* 1117-1142.

Upton, T.V. (1981). A note on Aristotelian epagoge. *Phronesis, 26*, 172-176.

Vacha-Haase, T., & Thompson, B. (2004). How to estimate and interpret various effect sizes. *Journal of Counseling Psychology, 51,* 473-481.

Vallerand, R.J. & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of cognitive evaluation theory. *Journal of Sport Psychology,* 6, 94-102.

Viteles, M.S. (1932). *Industrial psychology.* New York: WW. Norton.

Viteles, M.S. (1953). *Motivation and morale in industry.* New York: WW Norton.

Wahba, M.A. & Bridwell, L.G. (1976). Maslow reconsidered: A review of research on the need hierarchy theory. *Organizational Behavior and Human Performance, 15*, 212-240.

Watson, J. B. (1913). Psychology as the behaviorist views it. *Psychological Review*, *20,* 158-177.

Watson, J. B. (1925). *Behaviorism.* New York: WW Norton.

Watson, J.B. & McDougall, W. (1928). *The battle of behaviorism.* London: Kegan Paul.

Watson Wyatt Worldwide (2002). Human capital index: Human capital as a lead indicator of shareholder value, Washington, DC.

Weiner, B. (1966). Effects of motivation on the availability and retrieval of memory traces. *Psychological Bulletin*, *65*, 24-37.

Weiner, B. (1972). *Theories of motivation: From mechanism to cognition.* Chicago: Markham.

Weiner, B. (1974). An attributional interpretation of expectancy-value theory. In: B. Weiner (Ed.) *Cognitive views of human motivation.* New York: Academic Press. 51-69.

Weiner, B. (1980a). A cognitive (attribution) emotion-action model of motivated behavior: An analysis of judgments of help giving. *journal of Personality and Social Psychology, 39,* 186-200.

Weiner, B. (1980b). *Human motivation.* New York: Holt, Rinehart and Winston.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92,* 548-573.

Weiner, B. (1991). Metaphors in motivation and attribution. *American Psychologist, 46,* 921-930.

Weiner, B. (2010). The development of an attribution based theory of motivation: A history of ideas. *Educational Psychologist, 45,* 28-36.

Weiner, B., Heckhausen, H., Meyer, W.U. & Cook, R.E. (1972). Causal ascriptions and achievement behavior: A conceptual analysis of effort and reanalysis of locus of control. *Journal of Personality and Social Psychology*, *21*, 239-248.

Weiner, B., Russell, D. & Lerman, D. (1978). Affective consequences of causal ascriptions. In: J. H. Harvey et al. (Eds.), *New directions in attribution research* (Vol 2). Hillsdale: Erlbaum.

Welch, B.L. (1951). On the comparison of several mean values: An alternative approach. *Biometrika, 38,* 330-336.

Wheeler, L. & Suls, J. (2005). Social comparison and self-evaluation. In: A. J. Elliot & C.S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 566-578). New York: The Guilford Press.

Wicklund, R.A. & Brehm, J.W. (1976). *Perspectives on cognitive dissonance.* Hillsdale, N.J.: Erlbaum.

Wigfield, A. & Eccles, J.S. (2002). The development of competence beliefs, expectancies for success, and achievement values from childhood through adolescence. In: A. Wigfield & J.S. Eccles (Eds), *Development of achievement motivation (pp. 91-120).* San Diego, Ca: Academic Press.

Wilcox, R.R. (1995). ANOVA: a paradigm for lower power and misleading measures of effect size. *Review of Educational Research, 65,* 51-77.

Wilcox, R.R. (1998). How many discoveries have been lost by ignoring modern statistical methods? *American Psychologist, 53,* 300-314.

Wilkinson, L. & the APA Task Force on Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist, 54,* 594-604.

Williams, S.B. (1938). Resistance to extinction as a function of the number of reinforcements. J*ournal of Experimental Psychology, 23,* 506-522.

Wilson, J.F. (2003). *Biological foundations of human behavior*. Belmont, CA: Wadsworth.

Winer, B.J., Brown, D.R. & Michels, K.M. (1991). *Statistical principles in experimental design.* New York: McGraw-Hill.

Wolf, A. (1925). *Essentials of scientific method*. London: Macmillan.

Woodworth, R.S. (1918). *Dynamic psychology*. New York: Columbia University Press.

Wortman, C.B. & Brehm, J.S. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In: L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 8). New York: Academic Press.

Wright, P. M., Kacmar, K. M., McMahan, G.C., & Deleeuw, K. (1995). P=f(MxA): Cognitive ability as a moderator of the relationship between personality and job performance. *Journal of Management, 21*, 1129-1139.

Yates, A.B. (1962). *Frustration and conflict*. London: Methuen.

Zajonc, R.B. (1968). Cognitive theories in social psychology. In: G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (Vol. 1, 2nd ed.). Reading, Mass.: Addison Wesley.

Zeaman, D. (1949). Response latency as a function of the amount of reinforcement. *journal of Experimental Psychology, 39,* 466-483.

Zeigarnik, B. (1927). Über das behalten von erledigten und unerledigten handlungen. *Psychologische Forschung, 9,* 1-85.

Zeigler, H.P. (1964). Displacement activity and motivational theory: A case study in the history of ethology. *Psychological Bulletin*, *61*, 362-376.

Ziliak, S.T. & McCloskey, D.N. (2008). *The cult of statistical significance: How the standard error costs us jobs, justice, and lives*. Ann Arbor: University of Michigan

Zillmann, D. & Bryant, J. (1982). Pornography, sexual callousness, and the trivialization of rape. *Journal of Communication, 32,* 10-21.

Zimbardo, P.G. (1969). The human choice: Individuation, reason, and order versus deindividuation, impulse, and chaos. In: W.]. Arnold & D. Levine (Eds.), *Nebraska symposium on motivation.* Lincoln: University of Nebraska Press.

Appendices

In this Dissertation, reference is made to separate Appendices.
These Appendices can be found online at Leiden University Repository, Dissertations, with following URL:
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