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Exploring perspectives for improving students' motivation in pre-vocational secondary education

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Chapter 4

Goal salience in the classroom

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Abstract

In this exploratory study, cluster analyses and multidimensional unfolding technique were used to visualize goal salience. A total of 1,733 students from secondary vocational educations reported on the importance of 16 goals, using the GIFI, which is based on the 24 goal taxonomy proposed by Ford and Nichols (1991). Results show that students make a clear distinction between ego and non-ego goals and that non-ego goals are reported as most important by most students. Also, differences within the group of boys and the group of girls, and differences between boys and girls are shown. The results and possibilities of multidimensional unfolding for future research on goals are discussed.

4.1 Introduction

The aim for our empirical work on goals is to document that students bring multiple content goals into the classroom, to visualize goal salience, and to study how different goals interact. Boekaerts and colleagues have argued that individuals pursue multiple goals that energise and direct their behaviour. Salient goals give meaning to people's life and achieving or not achieving these goals is relevant to their personal and social well-being. Educational psychologists have routinely focused on achievement goals and social goals that students pursue in the classroom, but education researchers have not really studied students' multiple content goals or goals as a system. Boekaerts and colleagues conducted several studies with adolescents, using the Goals Identification and Facilitation Inventory (GIFI), which is based on the 24 goal taxonomy proposed by Ford and Nichols (1991).

Our focus on the multiple content goals that students bring into the classroom reflects the appeal that researchers in main stream psychology (e.g., Carver & Scheier, 2000; Ford & Smith, 2007) and educational psychology (Boekaerts, De Koning, & Vedder, 2006; Dowson & McInerney, 2003; Lemos & Gonçalves, 2004) made for studying the individual's goals as a system.

For our studies on multiple goals, we chose vocational schools. There are several reasons for studying the motivation of students in secondary vocational education. First, these students show low motivations for academic subjects and have high dropout rates, already visible in pre-vocational secondary education (Central Bureau for Statistics, 2015). Second, a decrease in motivation becomes visible simultaneously with students' psychological development in adolescence (Eccles, 2004). Especially from the age of 16 years, goals other than learning goals might gain relevance, influencing students' motivation for school.

We find it important that gender differences are taken into account when students' goals are studied. Several researchers assumed that there are gender differences in motivation

and goals salience (e.g. Martin, 2003, 2004). However, Dowson, McNerney, and Nelson (2006) stated that there is little empirical evidence. Their own study showed a gender effect only on social concern goals: for boys social concern goals were less important than for girls. In a study by Hijzen, Boekaerts, and Vedder (2006) girls reported higher preferences for social support goals and also for mastery goals, whereas boys valued superiority goals higher. We are convinced that the multidimensional unfolding technique (Busing, 2010) will enable us to gain more insight into the goals students pursue and will reveal gender differences in goal salience. Before we discuss this technique, we will briefly discuss current thinking about the pursuit of multiple goals.

4.2 Conceptualization of Multiple Goal Pursuit

Performance vs. mastery orientation

An important line of research that investigates students' goal pursuit is achievement goal theory. Achievement goal theorists (e.g. Linnenbrink-Garcia, Tyson & Patall, 2008; Pintrich, 2000; Urdan, 2004) have focused on a single type of goal, namely achievement goals. Goal theorists want to understand *why* students set themselves particular goals rather than *what* type of goals they want to pursue. Urdan and Maehr (1995) described two main reasons for goal pursuit in the classroom, namely wanting to learn and understand the material (mastery goal) and wanting to demonstrate to others that one has the ability to get good grades and to outperform others (performance goal). Reviewing the extant literature, Urdan (2004) stated that mastery goals are associated with positive outcomes whereas the results for performance goals have been less consistent. The work of Harackiewicz and colleagues sheds some light on these findings (e.g., Harackiewicz, Barron, Pintrich, Elliot, & Trash, 2002).

Harackiewicz elaborated the distinction between mastery and performance goals by crossing these goals with approach and avoidance goals. In general, the literature on mastery-

approach and performance-avoidance goals has been consistent. For example, Linnenbrink-Garcia et al. (2008) reported benefits from pursuing mastery-approach goals (e.g. enhanced interest, deep-level processing, and the use of meta-cognitive strategies). Performance-avoidance goals seem to be detrimental for learning, mainly because the students' focus is on avoiding to look incompetent relative to peers. This creates anxiety and lower levels of interest, and in turn, lower achievement. Results on the effect of performance-approach goals have been less consistent, especially in conglomeration with mastery goals. Goals theorists discuss the effect of the pursuit of a single goal (a mastery approach goal or a performance approach goal) or the pursuit of both goals simultaneously. Barron and Harackiewicz (2001) defined four different effects from the pursuit of both mastery approach and performance approach goals. First, when each goal is independently beneficial for a single outcome, it is defined as an additive effect. Second, an interactive effect is established when the pursuit of both goals is more adaptive than the pursuit of one of the goals alone. Third, goals can have unique effects on multiple outcomes, labelled as specials effects. Finally, a selective effect emerges when the effect of personal goals depends on the match with the goal context.

According to adherents of the mastery goals perspective, mastery goals are beneficial in all situations. These researchers assert that performance-approach goals can, under certain conditions, be beneficial for learning. Harackiewicz et al. (2002) reported positive associations between a range of indices of performance and achievement and the pursuit of performance-approach goals (see also Linnenbrink-Garcia et al., 2008). However, performance-approach goals may also trigger negative emotions, such as performance anxiety (Middleton & Midgley, 1997), even in combination with mastery goals, suggesting that there is no interactive effect. Yet, researchers who support the multiple goal perspective suggest that there is an interactive effect and that the pursuit of both mastery goals and performance approach goals in concert is more beneficial for various aspects of learning than

the pursuit of mastery goals only. For an interesting overview on different findings on both perspectives, see Linnenbrink (2005).

Social goals interact with mastery and performance goals

The four different effects of goals pursuit can be extended to the research on non-learning goals. Recall that most goal theorists have defined classrooms as achievement contexts and defended the view that learning and achievement goals are the most prominent goals that students pursue in that context. A number of researchers have also studied the social goals that students pursue in the classroom (e.g. Hijzen et al., 2006; McInerney, 2004; Lemos & Gonçalves, 2004; Wentzel, 1996, 2000) and their interaction with mastery goals. For example, Wentzel (1996) stated that students who value both mastery and social responsibility goals are willing to invest more effort in academic work than students who attach less importance to these goals. She also found that entertainment goals and belongingness with peers goals impede rather than support learning. The former goals, mastery and social responsibility, are more salient in high achievers and the latter goals, entertainment and belongingness, in low achievers. Boekaerts and Hijzen (2007) confirmed these results in a vocational school context. They also showed that students who value belongingness with peers have a lower perception of the quality of collaborative work in the classroom than students who do not value these goals.

Although researchers have accrued some information about the interaction of achievement and social achievement goals (social responsibility, social status, social approval, and social affiliation goals) in a school context (e.g. Dowson & McInerney, 2003), we still know very little about the conflicts that may arise when students pursue non-learning goals simultaneously with learning goals. Ford (1992) and Ford and Smith (2007) argued that we need to develop a comprehensive model of students' goal endorsement and study

students' goals *as a system*, displaying the superordinate and subordinate relations among the goals. The taxonomy of goals that Ford and Nichols (1991) constructed is based on a system perspective that is grounded in developmental theory. Ford (1992) explained that 24 different content goals provide information on the consequences that these goals represent for different people. He argued that having knowledge about the *content* of a person's salient goals tells us something about the way that this person assigns meaning to his or her life in that particular period of life. Ford also maintained that goals can have an interactive effect. He clarified that people's behaviour is often guided by multiple content goals simultaneously and that the most motivating activities and experiences are those that involve the simultaneous pursuit and attainment of many different kinds of goals.

Nine core goals provide information on adolescents' goal-directed behaviour

Boekaerts and colleagues (e.g. Boekaerts, 2009; Hijzen et al., 2006) developed the Goal Identification and Facilitation Inventory (GIFI) to measure adolescents' goal salience. The aim of these studies was to find out which of the 24 taxonomy goals (Ford & Nichols, 1991) are meaningfully rooted in adolescents' everyday reality. Boekaerts (2009) found that 16 of the 24 goals identified in the taxonomy were endorsed by vocational students. Hierarchical cluster analysis revealed that these students clearly differentiated between non-ego goals and a cluster of three ego goals (i.e. Superiority, Individuality, and Material Gain). The non-ego goals further differentiated into a task-related goal cluster and a social goal cluster.

Recently, Smit, Boekaerts, and Pat-El (in preparation) re-analyzed the data set. Using exploratory and confirmatory factor analysis on a split half of the subjects, they extracted nine core goals. Interestingly, the goals Mastery and Management were combined into one goal cluster (e.g. I want to learn new things; I want to complete my work in time). The goals Support Provision and Support Acquisition combined into *social support goals* (e.g. I want to

support others; I want others to help me when I have difficulties). The goals Self Determination, Equity Parents and General Equity were also joined together into *self-determination and equity goals* (I want to be treated fairly; I want to have decision latitude). The goals Positive Self-evaluation, Tranquility and Entertainment were integrated into *feel-good goals* (e.g. I want to feel confident; I want to feel happy; I want to enjoy my studies). The goals Belongingness and Social Responsibility were also interrelated into a *Belongingness and social responsibility goals* (e.g. I want to be liked; I want to feel welcome in the group, I want to respect others). The goal Safety (e.g. I want to stay out of trouble; I want to avoid risks) remained a separate goal and so did the three ego-goals: Superiority (e.g. I want to be better than others, I want to impress others), Individuality (e.g. I want to have special things, I want to be unique), and Material Gain (e.g. I want to earn a lot of money; I want to have many clothes).

Please note that some of the 16 content goals that Boekaerts (2009) reported are now interlinked with other goals, suggesting that adolescents mentally represent these goals in a similar way. For example, they do not seem to separate the goals Mastery and Management implying that wanting to learn new things and managing one's resources to acquire new knowledge and skills are perceived by the students as the same goal. Similarly, the goals General Equity, Equity Parents and Self-determination are intertwined, suggesting that in the students' theory of mind wanting to be treated fairly in class and having room to make one's own decisions are two sides of the same coin. This also applies for the goals Belongingness and Social Responsibility. They seem to communicate that they want to feel welcome in the peer group (i.e. be respected for who they are) and that they will –in turn- respect others.

In the present study we explored the interaction of these nine core goals. We used cluster analysis and multidimensional unfolding to visualize the patterning of the nine core goals for both boys and girls.

4.3 Method

Subjects

The present study is part of a larger project on vocational students' goals and motivation. Participants were Dutch first-year students attending secondary vocational education. A subsample of 1,713 students (55.9% girls) from nine different secondary vocational schools, spread evenly across the Netherlands, was used. Students' age ranged from 15 to 55 years with an average of 18 years and 1 month ($SD= 3.56$ years). Most students were enrolled in health and welfare programs (54.2%), a part of the students were enrolled in retail and administration (21.5%), and relatively few students were enrolled in engineering and ICT (15.9%).

Instruments

Students' goal salience was measured with the Goal Identification and Facilitation Inventory (GIFI) which is based on the 24 goals of Ford and Nichols (1991). Data collection took place in the second semester of the students' first year in the classroom. Students were asked how important each goal was, using a five point Likert scale ranging from 'very unimportant (1)' to 'very important (5). Smit et al. (in preparation) used an exploratory and a confirmatory factor analysis and extracted nine scales. Table 1 presents the nine goals, sample items, and the reliability for each goal.

Table 1. *Goals, sample items, number of items and Cronbach's alpha coefficients*

Goal	Item sample	Items	Alpha
Mastery & Management (MM)	I want to learn new things; I want to complete my work on time	16	.96
Social Support (SO)	I want to support others; I want to be supported	8	.92
Self Determination and Equity (SE)	I want to be treated fairly; I want to have decision latitude	14	.95
Feel Good (FG)	I want to feel confident; I want to enjoy my classes	10	.94
Belongingness and Social responsibility (BS)	I want to feel welcome; I want to respect others	10	.90
Safety (SF)	I want to stay out of trouble	4	.83
Superiority (SU)	I want to be better than others	9	.94
Individuality (IN)	I want to be unique	4	.87
Material Gain (MG)	I want to have a lot of clothes	4	.85

Analyses techniques

We began the analyses with Ward's hierarchical cluster analysis. This technique is used to explore and classify data sets in groups of objects that resemble each other and differ from other objects in the data set (Everitt, Landau, & Leese, 2001). It is an exploratory tool designed to reveal natural groupings or clusters. Hierarchical clustering provides detailed information by showing the different levels to which objects and clusters of objects belong, visualized in a dendrogram. Ward's hierarchical clustering method is based on variance, clustering objects with small variance within each cluster and large variance between the clusters (Gordon, 1999). Other clustering techniques offer possibilities to cluster objects or respondents. As we wanted to study goals as a system, we chose to cluster the goals. Since we expected gender differences in goal salience, we applied the clustering techniques separately for boys and girls.

We continued our analyses with the multidimensional unfolding technique, which is a special case of multidimensional scaling (MDS). The multidimensional unfolding technique is an exploratory technique intended to study preference scores, which can be seen as proximities between the elements of two sets (individuals and objects). It leads to a configuration that is based on the preference scores of each individual for each object, translates into distances (Busing, 2010). We used the mean score for each goal for each respondent to determine preferences. Individuals are placed at the ideal spot in the multidimensional space, so that the graph reflects each individual's preference scores to the various objects. In other words, respondents are located closest to their most preferred objects and furthest from their least preferred object, implying that high preferences correspond with small distances and vice versa. The advantage of this technique is that it transforms the relations between each respondent and the set of objects into comprehensible graphic output.

An excellent and detailed overview of multidimensional unfolding can be found in Busing (2010) and Borg and Groenen (1997).

4.4 Results

We wanted to know the importance that students attach to ego and non-ego goals, how these goals are related, and whether the pattern of relations between the nine goals is different for boys and girls. Two techniques were used to explore the data sets, namely the hierarchical cluster analysis technique and the multidimensional unfolding technique. The nine goals that were described above will be represented in the respective figures by short labels, namely BS for the goals Belongingness and Social Responsibility, SF for the goal Safety, FG for Feel Good goals, SE for the goals Self Determination and Equity, SO for the Social Support goals, MM for the goals Mastery and Management, IN for individuality, MG for the goal Material Gain, and SU for the goal Superiority.

We performed two separate cluster analyses, both describing the relations between the nine goals, but for girls and boys separately. We wanted to identify a discrete number of goal clusters. Visual inspection of the dendrograms of boys and girls reveals how the nine goals are clustered. Comparison of Figure 1a and 1b reveals that the dendrograms are very similar. It is evident that there are four closely inter-related goals in Figure 1a, namely SE, MM, SO, and FG. This suggests that girls in vocational education report as equally salient in their life ‘wanting to be treated fairly and be granted decision latitude’(SE), ‘wanting to master the learning material and manage one’s own activities to reach this goals’ (MM), ‘wanting to help others and be helped by others’ (SO), and ‘wanting to feel confident and enjoying learning’(FG). We would like to refer to this cluster of four core goals with the term ‘learning-related goals’. The goals Belongingness and Social Responsibility are added to this primary cluster at a short distance (at a cut-off point of 2.5 on the ordinate) and the Safety

goal is added a little higher in the dendrogram (at a cut-off point of 3 on the ordinate). The three ego goals, especially Individuality and Superiority, are quite distinct from the non-ego goal cluster.

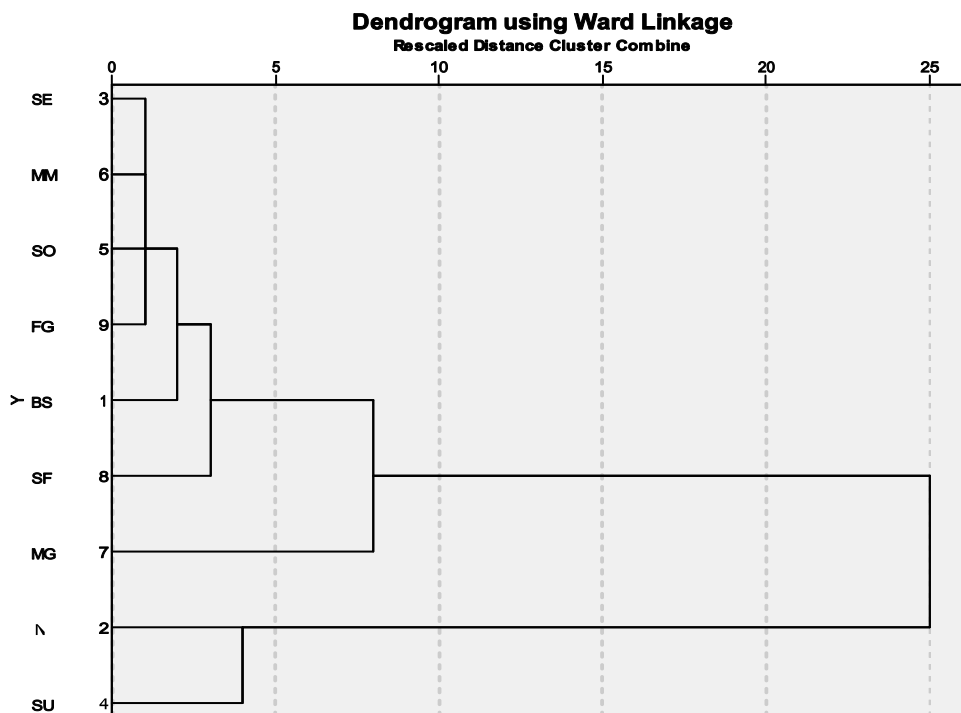


Figure 1a: Cluster with girls' goals

In Figure 1b, we observe that three of the four goals that were clustered in the initial stage of the hierarchical clustering in the dendrogram for girls are also closely related goals for boys, namely the Self Determination & Equity goals, the Mastery & Management goals, and the Feel Good goals. At a short distance in the dendrogram, the goals Social Support, and Belongingness and Social Responsibility were added (respectively, below the cut-off points of 2.5 and 3 on the ordinate). This suggests that the social goals (Social Support and Belongingness and Social Responsibility goals) are closely associated with the learning-related goals, but are also distinct from them.

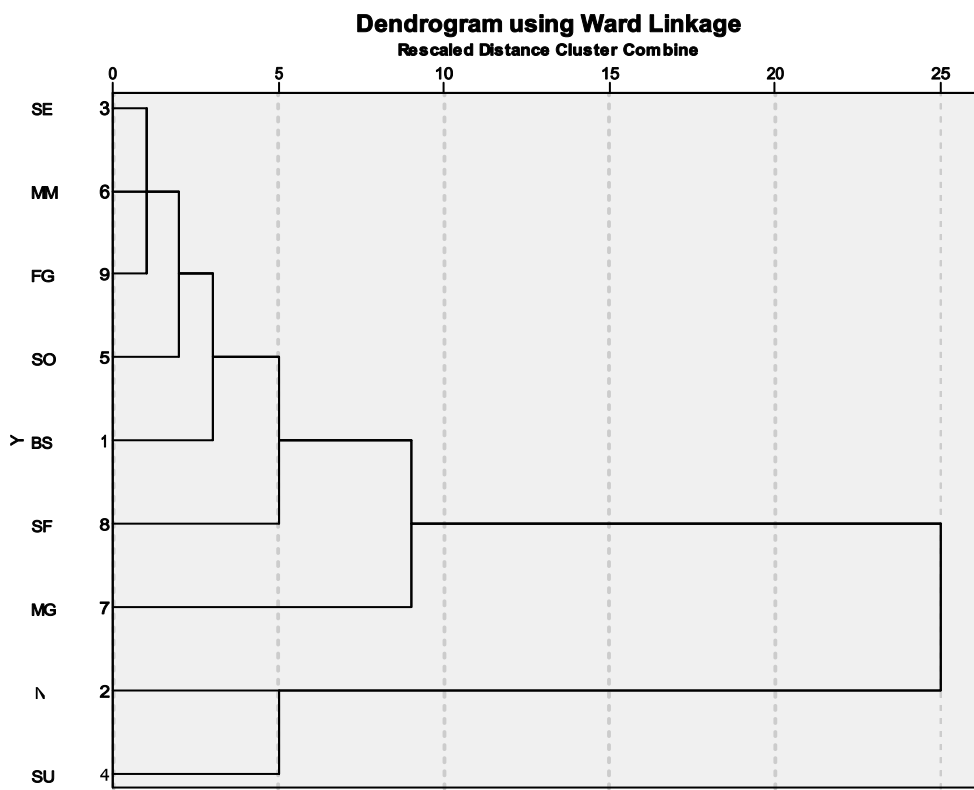


Figure 1b: Cluster with boys' goals

Please note that in both dendrograms the goals Individuality and Superiority are clustered early in the hierarchical classification and do not cluster with any of the non-ego goals. The goal Material Gain has an ambivalent position; it is neither clearly associated with the ego goals nor with the non-ego goals.

A difficulty with using dendrograms to identify clusters is to decide on the distance at which the clusters are to be formed. Myatt and Johnson (2009) argued that once the distance cut-off point is selected, a line may be drawn cutting through the dendrogram at the chosen distance. Generally, choosing a cut-off point high on the ordinate will produce fewer groupings but the diversity within each group will be greater. Cut-off points set at a lower distance on the ordinate result in a greater number of clusters, but more homogeneity within

the groups. We decided to select a cut-off point of 5 on the ordinate and that yields three groupings in both dendrograms. As stated, the dendrograms were almost similar for girls and boys. Boys seem to differentiate slightly more between the goals than girls do.

Whereas cluster analyses provide us with clusters of goals based on common characteristics, the multidimensional unfolding technique enables us to examine within a single configuration the position of the goals in relation to each other and in relation to the importance that each individual respondent assigned to each goal. Again, as we expected differences in gender, we unfolded separately for boys and girls. Unfolding can be done with multiple dimensions, but more than two dimensions are difficult to interpret. Therefore, we chose to perform the unfolding with two dimensions.

To interpret the configuration, any characteristics of the configuration from the multidimensional unfolding process that are unlikely to result from chance can be marked. Dependent on what the configuration shows, this marking may take the shape of dimensions, groups, clusters, regions, and lines, curved or straight (Borg & Groenen, 1997).

Figure 2a and 3a show the results as displayed by the PREFSCAL procedure. Our interpretation of the unfolding results is presented in Figures 2b and 3b. The position of the respondents in Figure 2a tells us that girls who value mastery and management goals, do that in combination with four non-ego goals, namely Self Determination and Equity, Belongingness and Social Responsibility, Social Support, and Feel Good goals (learning-related goals). These non-ego goals are concentrated in the middle of the graph, close to each other, even on top of each other. This indicates that girls value several goals as equally important. The goal Safety (SF) which is conceptually a part of the non-ego goals is clearly separated from the other non-ego goals and the three ego goals, meaning that girls view this goal as distinct from the other non-ego goals.

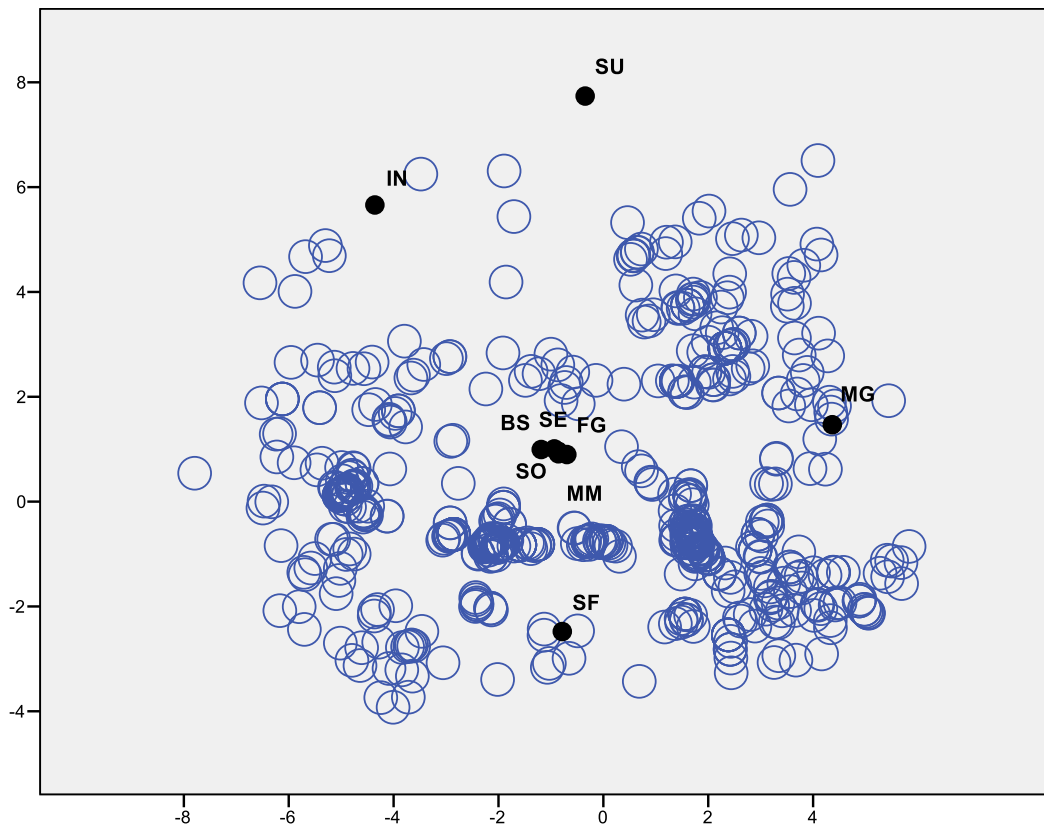


Figure 2a: Representation of unfolding with girls and goals, • = goals, O = respondents, N= 762

The three ego goals, Superiority, Individuality and Material Gain) are also located in the periphery of the graph, clearly distinct from the location of the non-ego goals. Please note that individuality goals (IN) and superiority goals (SU) are valued least by most girls. Within the group of ego goals, material gain (MG) stands out as a salient goal for a large group of girls. To further explore the configuration generated for girls, we circled groups of respondents who are located in the vicinity of the respective goals.

Keep in mind that respondents are located closest to the goals they reported as most important and furthest away from the goals they reported as least important. Groups of respondents can be described in terms of their position relative to the learning-related goals in

the middle of the graph and any of the goals located at the periphery of the graph (i.e. the safety goals and the three ego goals). As can be seen in Figure 2b, there is a heavy preponderance of respondents in specific parts of the graph. Hence, four unique *goals patterns* can be discerned. These are marked by the four circles.

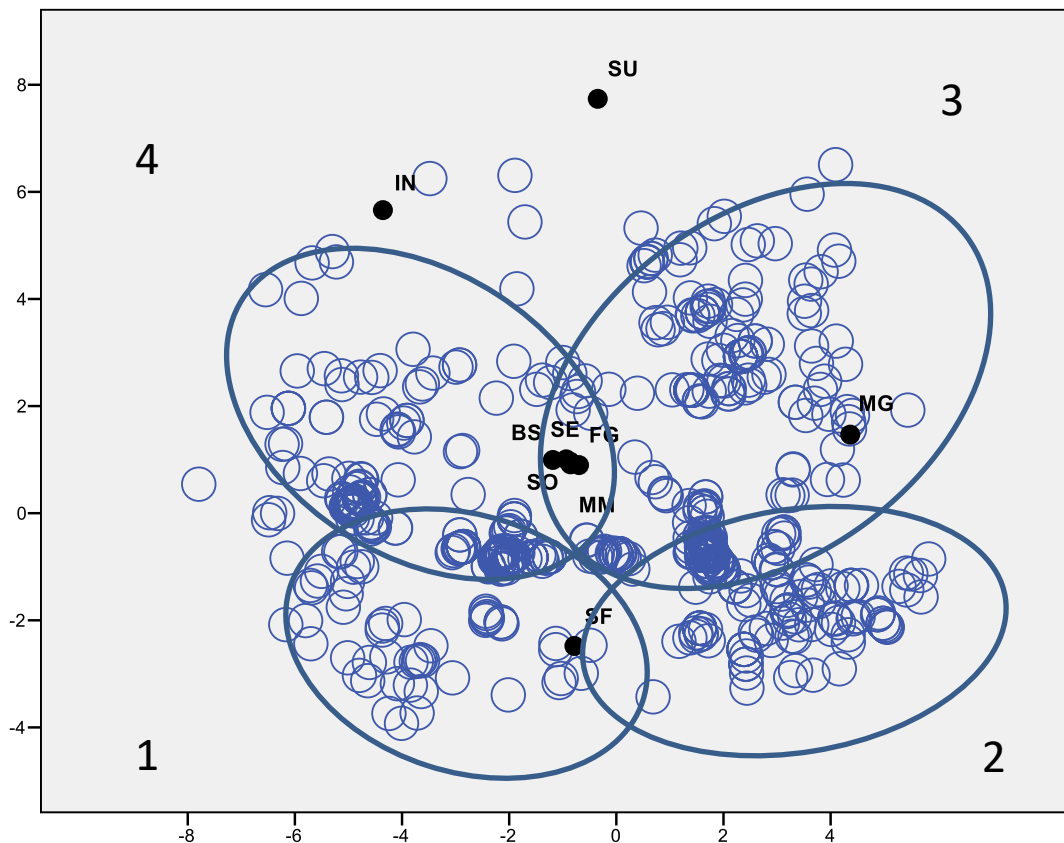


Figure 2b: Interpretation of unfolding with girls and goals. • = goals, O = respondents, N= 762

Girls in circles 1, 2, and 3, and 4 all attach importance to the five non-ego goals located in the center of the graph (MM, BS FG, SE, SO). In addition, girls in circle 1 express a preference for the goal Safety (SF). They do not seem to value the goals Individuality, Superiority, or Material Gain. This suggests that these girls are inclined to adopt learning-related goals but at the same time want to avoid taking risks. By contrast, girls in circle 2

value learning related goals and also attach additional value to the Material Gain goal (MG). This suggests that they are extrinsically motivated. Girls who are located in circle 3 seem to have preferences for Material Gain (MG) and, to a lesser extent, for the Superiority goal (SU). These girls do not attribute much importance to safety goals. This patterning suggests that these girls want to demonstrate their ability and obtain material rewards, but are not concerned about taking risks. Finally, girls in circle 4 value learning-related goals and to a lesser extent have a preference for the Individuality goal (IN). They want to show that they are unique.

It is clear that multidimensional unfolding may shed light on respondents' *goal pattern*. Examining the type of goals that students endorse and the ones that they consider as unimportant in their current life supplies us with information on how their goals work as a system. We will come back this issue later in the discussion.

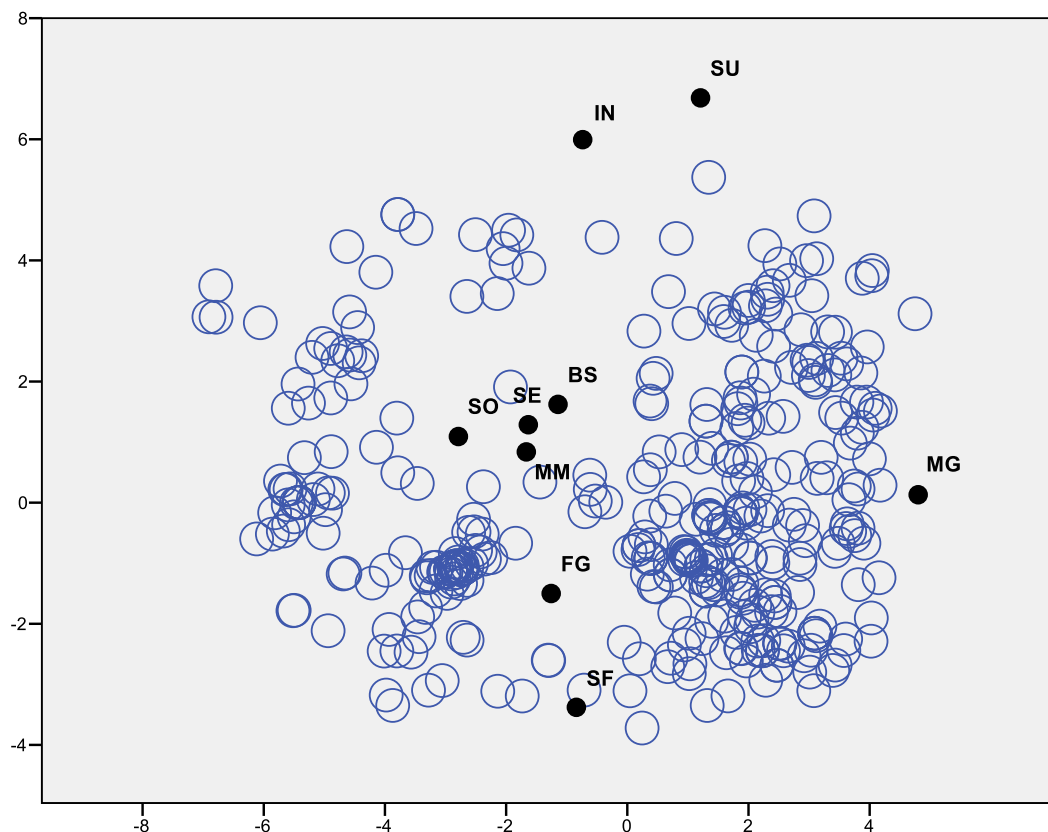


Figure 3a: Representation of unfolding with boys and goals • = goals, O = respondents, N= 403

Figure 3a shows that the nine goals are clearly visible. Unlike the representation found in girls, the non-ego goals are less intertwined. Mastery and Management goals are closely related to the Self Determination and Equity goals and are flanked by Belongingness and Social Responsibility to the right and Social Support goals to the left. Both the Safety goal and the Feel-Good goals are pushed to the periphery, implying that boys conceptualize the latter goals as distinct from the four learning-related goals. Similar to what we noticed in the visual representation of girls, the three ego goals are located at the periphery of the graph, and within the group of ego goals, Material Gain (MG) stands apart from Individuality (IN) and Superiority (SU). Similar to girls, the goal Material Gain (MG) is reported as important by a substantial number of boys. The interpretation of the unfolding results is presented in Figure 3b.

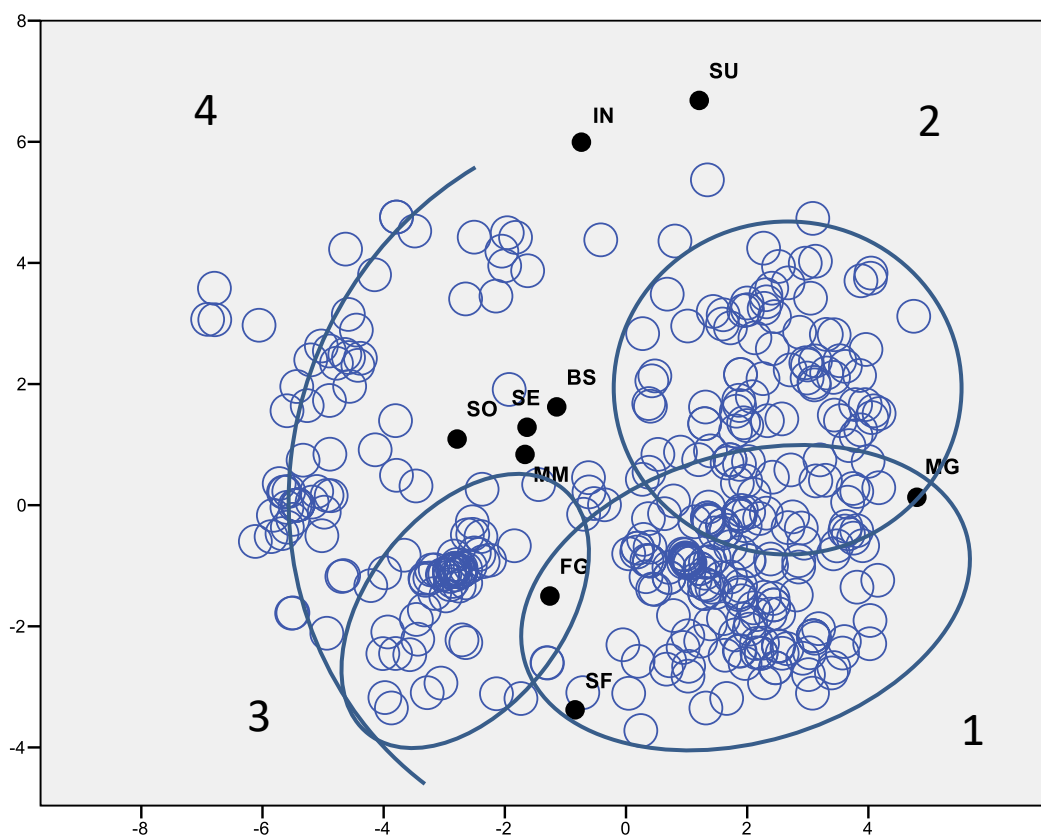


Figure 3b: Interpretation of unfolding with boys and goals. • = goals, O = respondents, N = 403

As can be seen in Figure 3b, there are high concentrations of respondents at the right side of the configuration, located between the learning-related goals on the left and the goal Material Gain (MG) on the right. This suggests that boys located on the right of the graph attach more value to Material Gain (MG) than boys on the left. Within this group, boys located in circle 1 show an additional preference for the goals Safety and the Feel-Good goals, and boys located in circle 2 show supplementary preferences for Superiority and Individuality. Focusing on the left side of the graph, we notice a high density of respondents in circle 3. These boys value learning-related goals, but also attach importance to the Feel-Good goals and, to a lesser extent, to Safety. They do not attach much importance to the three ego goals (Superiority, Individuality, and Material Gain). This patterning suggests that in order to adopt learning-related goals, some male students want to feel good in the learning environment (i.e. they want to feel confident and enjoy their classes).

The curved line (4) shows a group that values learning and learning-related goals, but the importance that is attached to other goals shifts gradually from Feel Good (FG) and Safety goals (SF) to Individuality (IN) and Superiority (SU) goals. Boys located at the top of the curved line express a preference for the Individuality goal. These boys do not attribute much importance to Feel-Good, Safety, and Material Gain goals.

4.5 Conceptual and Methodological Issues

Looking at goal patterns from a goal content and goal purpose perspective

We began this paper by stating that the pursuit of goals in the classroom is rarely done from a content perspective. The predominant approach to the study of student goals is to describe the reason why students engage in achievement related activities. Social–cognitive theory has provided significant insights into the pattern of achievement goals and how students’

perception of the classroom goal structure influences their goal orientation. Yet, achievement goals are not the only goals that students bring into the classroom.

In our goal studies we wanted to know which of the 24 mid-level goals that Ford and Nichols described are conceptually similar and distinct. We reasoned that – given the broad range of social and affective goals that students bring to the classroom in addition to the mastery and performance goals – it is likely that the importance that students attach to the different content goals influences their pursuit of the learning goals.

Cluster analyses revealed that there are four goals that girls in vocational school consider equally important, namely Self Determination and Equity (SE), Mastery and Management (MM), Social Support (SO), and Feel Good (FG), and three goals that male students find equally important, namely Self Determination and Equity (SE), Mastery and Management (MM), and Feel Good (FG). We referred to this cluster of goals with the term ‘learning-related goals’. We also noted that the goals Individuality and Superiority were clustered early in the hierarchical classification but did not cluster with any other goal. Material Gain had an ambivalent position for boys and girls.

Multidimensional unfolding confirmed that there is a small cluster of goals that refers to learning-related goal-directed behaviour. This cluster includes for boys and girls the Mastery and Management goals, the Self Determination and Equity goals, and the Social Support goals. For girls, Belongingness and Social Responsibility goals, and Feel-Good goals are also included in this learning-related cluster. In fact these six goals are intertwined. Interestingly, for both boys and girls, the Safety goal or the tendency to avoid problems and taking risks, are positioned at the periphery of the goal graph. Together with the three ego goals, which are also located in different positions in the periphery of the graph, SF goals help characterize the *unique pattern* of goals that students currently define as salient in their life. What can we say about the patterning of goals in boys and girls?

In girls we found four dominant goal patterns. A large group of girls attaches value to learning-related goals in combination with the Safety goal. This means that these girls want to avoid taking risks in the classroom. This is in accordance with the studies on gender differences that we mentioned earlier in this paper. A second substantial group of girls adopts learning-related goals but also wants to obtain material reward. A third group adopts learning-related goals and wants to demonstrate ability. The smallest group reports being an individual and unique as important, next to learning-related goals.

We found that most boys in secondary vocational education value the goal Material Gain in conjunction with learning-related goals. This suggests that a large majority of boys in secondary vocational education adopt learning-related goals but at the same time want to obtain material reward. This group of boys may be further divided into boys who want to demonstrate their ability and those who primarily want to feel good in class and avoid taking risks. There is also a small group of boys who express salience in learning-related goals in combination with Feel-Good goals; they do not attribute much value to the ego goals (Individuality, Superiority, and Material Gain).

At this point in the discussion, we return to the discussion on the different effects that the pursuit of multiple goals might have. The findings presented in this study allow us to speculate on the unique pattern of goals that students may bring to the classroom. It seems that different groups of students combine distinct goals with learning-related goals. Smit, Boekaerts and Busing (2011) also showed that students bring different salient goals into the classroom and that unique patterns of goals have a different effect on students' motivation. What is the interaction between salient goals? Do they simply coexist, as suggested by Lemos and Gonçalves, and has each goal a unique effect on motivation and achievement or is there an interaction (Barron & Harackiewicz, 2001)? In the case of an interaction, the next question

is whether the interaction is positive or negative. In terms of Lemos and Gonçalves' discussion: do salient goals support each other or compete with each other?

The next step in this line of research will be to identify different groups of students based on the salient goals they pursue. We think that the multidimensional unfolding technique discussed in this paper is a powerful technique to study the distinct effects that different patterns of goals may have on achievement and well-being in the classroom.

Methodological issues associated with the study of multiple goals

Studies of multiple content goals bring with them particular challenges in terms of methodological issues. The different goals that students bring into the classroom are not easy to measure because these goals are intertwined. For example, after doing a course in history, some students may report that they invested effort in the course because they felt that the material discussed in the course was meaningful and they wanted to become more knowledgeable about that period in history (mastery goal). The same students may elaborate that they invested effort because they have enjoyed helping others with the group project and getting support from their peers with their own work (social support goals). Unfortunately the goals that students pursue are hidden from outsiders so it is not possible to ask observers (e.g., parents, teachers, or researchers) to describe students' goals and triangulate the results.

How can we measure goal salience? One may ask students to indicate for each of the 24 goals identified by Ford and Nicholls (1991), or for the reduced list of 9 goals, how (un)important they are to them as a person in this period of their life. This can be done on a 5- or 7-point Likert scale. An alternative is to ask students to rank order a list of goals in terms of their salience. An advantage of the former procedure is that students consider each goal separately and use the same scale to indicate how (un)important they consider that goal.

Smit et al. (2011) asked students to rank order their current goals in terms of their salience. This technique has the advantage that students compare and contrast the various goals and assigning a unique value to each goal. In other words, students are forced to assign a different rank order to each of the goals. This means that, for example with 16 goals, the unfolding is performed with 16 values. By contrast, when the salience of the goals is measured with, for example, a 5-point Likert scale, the unfolding is carried out with five values, implying many tied values. This produces a more problematic data set for multidimensional unfolding, but it is probably a realistic view of students' goal salience. A problem with ranking is that one may force students to make a distinction when none exists. Furthermore, it is difficult for respondents to compare and contrast 16 goals. Smit et al. (2011) designed a two-step procedure to obtain the rank order of the 16 goals proposed by Boekaerts (2009). They asked students, first, to rank order the five most important goals and then the five least important goals. Next they invited them to repeat the procedure with the remaining goals: try to rank order the most important and least important goals within this set of goals. Whatever method is chosen to indicate goal salience, the researcher should be alert to problems like the ones discussed above and interview the students to examine which technique is the better one under the given conditions.

We emphasize that the multidimensional unfolding technique is a useful tool to study the relations between variables that might influence students' tendency to give purpose to tasks and activities in the classroom. The technique provides a visual display of the goals that students find important and less important and graphically displays the relations between the different goals. Separate pictures can be made for groups of students that are expected to differ on goal salience, for example for boys and girls, for students who follow different study programs, and students from different cultures. As such, interesting differences and similarities can be detected by screening these pictures systematically. In our goals studies we

wanted to know which of the 24 goals that Ford and Nichols describe are conceptually similar and distinct.

4.6 Conclusion

The study that we referred to in this paper is but a modest beginning. It was meant as an illustration of how the multi-dimensional unfolding technique can shed light on how students' goal function as a system. The patterning of goals that we found suggests that in both boys and girls in secondary vocational education a cluster of goals is closely associated with Mastery goals and Management goals. On the basis of this patterning we suggest that in vocational students 'wanting to master new learning material' goes hand in hand with 'wanting to be supported and help others', with 'wanting to be treated fairly and have decision latitude', and with 'wanting to belong in the peer group and take social responsibility'.

We were able to demonstrate that four goals are in the periphery of vocational students' goals system, namely the goals Superiority, Individuality, Material Gain, and Safety. These goals stand out against the learning-related goals in the center of the goals system. The position of groups of respondents in the graph relative to these 'marker' goals can inform us which goals are relatively important and unimportant for them as a group.

We hasten to remark that these are only preliminary results and that further research with the GIFI in different subsamples will reveal whether these patterns of goals are replicable in different populations. In the meantime, we conclude that the research community needs to develop powerful new techniques to study the additive and interactive effects between learning-related goals and the other goals that students bring into the classroom. Until recently, MDU provided a configuration only, and no information on significance. Busing is developing new applications for MDU, including the possibility to

add explaining variables and to test the significance of, for example, the predictive value of these variables. In our case, this will enable us to study different groups of students, defined by their position relative to the learning-related goals and the markers goals at the periphery of the graph, and relate them to motivational engagement.

We are convinced that we need to study students' goals *as a system* and develop models that are powerful enough to adopt a content and purpose perspective simultaneously. Only then will we be able to shed light on students' goals-directed behaviour in the classroom.