Connecting conditionals: a corpus-based approach to conditional constructions in Dutch

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CHAPTER 1

Introduction

Conditionals enable us to express our thoughts about possible states of the world. As such, they form 'an essential part of human reasoning and decision making' (Evans & Over, 2004, p. 1), i.e., they are 'essential to practical reasoning about what to do, as well as to much reasoning about what is the case' (Edgington, 2021, p. 1). Conditionals are involved, as Hartmann and Hahn (2020, p. 981) mention, in 'every aspect of our thinking, from the mundane and everyday such as "if you eat too much cheese, you will have nightmares" to the most fundamental concerns as in "if global warming isn't halted, sea levels will rise dramatically"'. That conditionals are instrumental in cognition can also be observed clearly in a recent 'kids only' special issue of Dutch newspaper *NRC* from March 27th, 2021, in which the use of the 'if-then trick' in (1) below is presented as one of a number of 'super powers for your head'.

(1) You often already know what your pitfalls are. For example, you know from experience that you often immediately crash down on the couch like a bag of potatoes because you are tired after a day of school. You can get out of that trap by imagine vividly beforehand how you would like to behave when you leave school. For example, *'If I'm about to crash down on the couch after school, I'll start programming my own game'* [emphasis added]. The trick is imagining the situation as clearly as possible in advance. This helps you to stick to your own resolutions. (de Jong, 2021, p. 11)

This simple example shows how we can and in fact do use conditional thought to reason about our own actions, and, as we will see shortly, about those of others.

In communication, we use conditionals, most prominently *if-then* sentences, to express thoughts about situations we are unsure about, situations we judge to be hypothetical, likely or unlikely, or situations we deem contrary to our current knowledge of the world (*what if...*). We decide to take an umbrella *if* it rains; *if* someone is rude, we evaluate her or his behaviour as inappropriate; we infer that one has to have been married *if* she is called a widow; and we can use conditionals to reason from a arguments to conclusions, as Agatha Christie's famous detective Hercule Poirot shows in (2) below by reasoning about the question who has opened the window prior to the murder of Roger Ackroyd.

(2) "Who opened it? Clearly only Mr. Ackroyd himself could have done so, and for one of two reasons. Either because the room became unbearably hot (but since the fire was nearly out and there was a sharp drop in temperature last night, that cannot be the reason,) or because he admitted some one that way. And *if he admitted some one that way* [emphasis added], it must have been some one well known to him, since he had previously shown himself uneasy on the subject of that same window." (Christie, 1926, p. 64, *The Murder of Roger Ackroyd*)

As the newspaper excerpt in (1) above shows, however, one of course does not need to be a famous detective to use conditionals. As Williamson (2020, p. 3) argues, 'hypothetical thinking is central to human cognitive life, from the naïve to the super-sophisticated. [...] We rely on hypothetical thinking in deciding what to do. Choosing between two alternative courses of action, you compare what will happen if you take one course with what will happen if you take the other'.

Whereas many studies focus on specific types of conditionals, or limit conditionals to those uses in which some kind of formal reasoning is involved, one needs only to look around to see that conditionals are used in many everyday situations. In various cases, the use of a conditional may not even be viewed as a reasoning task in the first place, as in (3) below.

(3) Maybe you will have to help me. We're not running our lives according to some account book. *If you need me, use me* [emphasis added]. Don't you see? Why do you have to be so rigid? (Murakami, 1987a, p. 10, *Norwegian Wood*)

In this example, instead of reasoning, the main character of Murakami's novel *Norwegian Wood*, Toru Watanabe, uses a conditional to contextualise an offer he makes his girlfriend Naoko. Whenever conditional thought is expressed in communication, a linguistic form has to be used. In the examples in (2) and (3), the subordinate clauses *if he admitted some one that way* and *if you need me* are introduced by the default conditional conjunction *if*. Although both examples use the same conjunction, the functions of the conditional clauses differ. The first conditional clause provides an argument for the conclusion that *it must*

have been some one well known to him presented in the main clause, and the second offers a context for the offer *use me* performed by uttering the main clause.

This dissertation focuses on various uses of conditionals, without excluding any use *a priori*. Moreover, by including both the meaning and form of conditionals, this study strives to answer the question how the grammar of conditionals contributes to their various uses and meanings. This question is, of course, phrased in only very general terms, and before properly formulating the main research questions of this study, which will be done by embedding the question above into the literature in chapter 2, I will offer a brief introduction to the subject of conditionals in this chapter.

In section 1.1, I will introduce conditionals as the subject of this dissertation. I will provide a general description of conditionals, together with a brief overview of different perspectives offered in the vast body of literature on conditionals. In section 1.2, then, I will introduce the main aim of this study. In section 1.3, I will introduce the theoretical background to this study, after which, in section 1.4, I will briefly introduce the data and methodology used. Next, in section 1.5, I will discuss the theoretical and methodological contributions of this dissertation to the field of linguistics in general, and the study of conditionals specifically. Finally, I will provide an overview of this dissertation in section 1.6, so the reader can choose which of the chapters may best suit their interests – *if* not all, of course.

1.1 Conditionals

Conditionals have been the subject of debates between scholars for centuries, as we will see in detail in the following chapters. Many of those debates revolve around the question concerning the general meaning of conditionals. To this day, this question elicits many different answers. In actual language use, the meaning of conditionals is not general, however, as they are used in specific 'usage events' (cf. Langacker, 1988b, p. 14; Verhagen, 2005, p. 24). Conditionals are used frequently, and seemingly without much difficulty or effort, to guide our actions, as in (4), or to predict those of others, as in (5).

(4) If I want to lose weight, then I should not eat yet another piece of cake.

(5) Peter will not go to the party if I am going.

We also use conditionals to argue about contrary-to-fact situations, as in (6), to reason logically, as in (7), and even to be polite, as in (8).

(6) If the train would have been on time, I would have been at the office already.

(7) If his wife died, he must be a widower.

(8) I very much like your dress, if I may say so.

With respect to their linguistic form, conditional thoughts, i.e., those thoughts in which one situation is dependent on another, often hypothetical situation, are expressed as complex sentences. All conditionals above are formed by combining a dependent (subordinate) clause and an independent (main) clause by means of a conjunction, usually, as in these examples, *if*.

Given their status as primary reasoning devices, it comes as no surprise that conditionals have been at the centre of attention in several academic disciplines, ranging from philosophy (for an overview, see e.g., Bennett, 2003) and linguistics (see e.g., Traugott et al., 1986; Athanasiadou & Dirven, 1997b; Liu, 2019a), to psychology (see e.g., Evans & Over, 2004; Oaksford & Chater, 2012), and computer science (see e.g., Crocco, Fariñas del Cerro & Herzig, 1995; Mirolo & Izu, 2019). Within linguistics, semantic studies have focused mainly on truth conditions, and have roughly equated the meaning of natural language conditionals ('if p, (then) q' or '$p \rightarrow q$') with material implication in logic ('$p \supset q$') in an attempt to answer the question in which situations a conditional should be considered true (see e.g., Sanford, 1989; Bennett, 2004; Magnus, 2015; Wason, 1968; Lewis, 1976; Jackson, 2006; von Fintel, 2011; Fugard et al., 2011; see also section 1.2 below). Other scholars criticise such logic-oriented analyses, for instance on psychological and pragmatic grounds (see e.g., Dancygier & Sweetser, 2005, pp. 13–14; Bonnefon, 2009; Boogaart & Reuneker, 2017). Usage-based analyses of conditionals often swiftly dismiss formal semantic approaches because of mismatches between the 'natural language conjunction *if*' and its equivalent operator in logic (see e.g., Athanasiadou & Dirven, 1997a; Declerck & Reed, 2001; Dancygier & Sweetser, 2005). As, from the perspective of natural language in actual usage contexts, linguists have been concerned with both the form and function of conditionals, several alternatives to the 'material analysis' have been proposed to account for conditionals in everyday language, such as Sweetser's (1990) account, in which she distinguishes between conditionals in different domains. Conditionals in the content domain express a connection in the real-world domain of causes and effects, as in (4) to (6) above, whereas conditionals in the epistemic domain express a connection extended from the content domain to the inferential domain of arguments and conclusions, as in (7) above. Finally, conditionals in the pragmatic domain express a connection even further extended into the domain of speech acts, as in (3) and (8). These domains have been demonstrated to be valid cognitive categorisations of reasoning processes by Verbrugge et al. (2007).

In argumentation theory, conditionals are crucially involved in the analysis of valid and invalid rules of inference (*modus ponens*, *modus tollens*; affirming the consequent, denying the antecedent respectively), and they may be used in the formulation of the major or *connecting* premise in arguments (see e.g., Toulmin, 2003; Horsella & Sindermann, 1992, p. 133; van Eemeren et al., 2014, Chapter 4; van Eemeren & Snoeck Henkemans, 2017, pp. 50–51). As such, they are used to connect a minor premise to a standpoint in order to arrive at a conclusion. In (9) below, for instance, the standpoint *Daniel is no athlete* is arrived at by combining the minor premise *he can't climb the stairs without*

losing his breath with the (conditional) major premise *if he were an athlete, he would have stamina* (see e.g., Gerlofs, 2009; van Eemeren, Grootendorst & Snoeck Henkemans, 2002).

(9) Daniel is no athlete. If he were an athlete, he would have stamina. But he can't climb the stairs without losing his breath. (Gerlofs, 2009, p. 89)

In recent pragma-dialectical argumentation theory, the initial focus on dialectic goals of presenting reasonable arguments has been extended with the rhetorical goal of persuading the interlocutor (cf. van Eemeren, 2010). In the concept of *strategic manoeuvring*, maximising this persuasiveness is combined with adhering to dialectic standards, and the choice to explicitly express a conditional in an argument, as is done in (9), is considered such a strategic manoeuvre (see e.g., Jansen, 2003, 2011; Reuneker & Boogaart, 2013).

In pragmatic and psychological research, conditionals are often analysed in terms of their implicatures (cf. Grice, 1975), i.e., in terms of what they are used for at speech-act level.[1] Fillenbaum (1986) and Evans (2005) show that conditionals are often interpreted as inducements or advice, and as such are understood by their perlocutionary effect (cf. Austin, 1962). Indeed, any cooperative language user will recognise (10) as a request to get the hearer to fix the car, whereas (11) is used as a threat to deter the hearer from coming any closer.

(10) If you fix the car I'll give you $100. (Fillenbaum, 1986, p. 179)

(11) If you come any closer I'll shoot. (Fillenbaum, 1986, p. 179)

Thompson, Evans and Handley (2005) provide further experimental evidence for this argumentative view by showing that people construct inferences beyond the information explicitly given in conditional statements. On a more global level, Mercier and Sperber (2011, 2019) hypothesise that the evolutionary roots of reasoning, and with it, the use of conditionals, are primarily argumentative, as does Tomasello (2014).[2]

As I hope to have shown, at least in part, conditionals are instrumental in human reasoning, and this explains the attention devoted to the topic within a wide range of disciplines. The analysis of conditionals in natural language is at the very heart of this dissertation, and we will come back to linguistic accounts of conditionals in more detail in chapter 2. Before doing so, however, and having addressed, in general terms, the object of this study, I will address the main aim of this dissertation in the next section.

[1] Note that analysing a conditional statement as a whole in terms of speech acts is not the same as analysing the relation between their parts in terms of the speech-act domain (see above, and Sweetser, 1990, Chapter 5), although the two perspectives are by no means incompatible.

[2] For a discussion and comparison of these views, see Verhagen (2021).

1.2 Main aim

In general terms, this dissertation attempts to answer the following questions: which meanings are expressed by sentences that have the form of a conditional statement, and how do these meanings relate to the grammatical properties of those sentences? These questions clearly need to be specified and reformulated in order to be answered. As mentioned above, the proper formulation of the central research question is postponed until chapter 2, because it needs to be embedded in the body of literature on conditionals available. This does not mean, however, that the question cannot be narrowed down to function as a guide for the remainder of this introductory chapter. In this section, therefore, I provide a preliminary specification of the question above by focusing on two linguistic aspects of conditionals: their meaning, and their form.

As we briefly discussed above, in many studies of conditionals, the meaning of a conditional statement, like any other statement, is defined in terms of truth conditions, i.e., what does the world have to be like in order for the statement to be judged true?[3] In many formal accounts, the conditional conjunction *if* in natural language is equated with the conditional (or 'material') operator $\supset$ in logic. In such accounts, conditionals are evaluated true in all cases except those in which the statement in the conditional clause, the antecedent or p, is true and the statement in the main clause, the consequent or q, is false. Take, for instance, the conditional statement from Noakes's *Lore of Running* in (12) below.

(12) The essential feature during this period of running is not to become breathless or overly tired. The average training pace will probably be 5 to 7 min/km; *if you are able to train at that pace, you will be able to run the marathon.* (Noakes, 1991, p. 202)

Now suppose that you are indeed able to run at an average pace between 5 to 7 minutes per kilometre, but you find out that you are not able to run a marathon. In that case, the author of (12) may be held accountable for a false statement, or, at least, poor advice. Of course, there can be many reasons why, even while being able to run at a certain pace, one would not be able to finish the marathon, but this is irrelevant to the strictly truth-conditional evaluation of (12). In actual language use, however, such reasons are indeed relevant, and what is generally denoted by the term 'meaning' is not limited to truth conditions alone (for a discussion on the term 'meaning', see Verhagen, 2019, p. 62, and the following chapters of this dissertation).

Two such 'non-truth-conditional' aspects of meaning are central topics in this dissertation. First, as I argue in chapter 2, by using the conditional conjunction *if*, as opposed to an assertive conjunction like *since*, a speaker cannot assert the statement it expresses. Although a coach may express (12) while at the same

[3] Or 'a world' in a possible-worlds semantics (see Kripke, 1959 and, for an overview, see Partee, 2010, pp. 15–20).

time witnessing his pupil running at an average pace of 5 minutes per kilometre around the track, it would be odd to do so without further reason. Next, for a coherent interpretation, there should be a kind of connection between the conditional clause and the main clause. Whereas the conditional in (12) conveys that being able to train at a certain pace causes or enables running the marathon, in (13), one would be hard-pressed to find such a connection and in consequence, many readers will find this a strange, or incoherent utterance at least (hence the ? sign; see the list of symbols on page xxi).

(13) ? If you are able to train at that pace, you will have a sister named Mary.

From a purely truth-conditional point of view, however, the conditional in (13) is true in any case it turns out the hearer indeed has a sister named Mary. Such puzzles have been at the heart of many debates on conditionals.

In the next chapter, I will discuss the concept of conditionality and the term 'meaning' in more narrow terms, which allows for a more specific analysis of these and other vital aspects of the analysis of conditionals. For now, however, I will use the examples above to ask the following question: to what extent does the conditional conjunction *if* used in natural language differ from the conditional operator $\supset$ used in logic? As this question mentions the linguistic notion of conjunction, it brings us to the second aspect of the study of conditionals, namely the grammatical form of conditionals.

As I mentioned right at the start of this chapter, one has to choose a linguistic form to express a thought in conversation, and using a conditional forms no exception. Expressing conditionals involves choices of grammatical form. Let us look again at the example in (9), repeated below for convenience.

(9) Daniel is no athlete. If he were an athlete, he would have stamina. But he can't climb the stairs without losing his breath. (Gerlofs, 2009, p. 89)

In this example, the speaker uses the past subjunctive of the verb *to be* (*were*). The verb form is not used however to refer to the past, but to convey a negative stance towards Daniel being an athlete, a phenomenon sometimes called 'fake tense' (cf. Iatridou, 2000).[4] When we change the tense of (9) from the past subjunctive *were* into simple present *is*, as in (14), we can see a corresponding change in meaning.

(14) # Daniel is no athlete. If he is an athlete, he has stamina. (But he can't climb the stairs without losing his breath.)

The change in meaning concerns what we will refer to as 'epistemic distance' in chapter 2. This negative stance, i.e., some sort of negative belief, is what is removed from (9) in (14), which would, consequently, become inconsistent (#) with the conclusion that Daniel is not an athlete preceding it, and the statement that he cannot climb the stairs without losing his breath following

[4]Note that in Dutch, a regular simple past tense verb form can be used to express such a negative stance (e.g., 'Als hij een atleet was [...]'). See section 5.4.

it. These and other grammatical means are what speakers in natural language can employ to express various types of conditional thoughts. While this may seem obvious, the study of conditionals has focused for a large part on the meaning of the conjunction *if* or its counterparts in other languages, and in effect, numerous debates revolve around the question what *if* means. This is not to say that there is no body of literature on the role of other grammatical features, tense being the primary candidate, but the grammar of conditionals does not end there. Contrasting (4) and (5), repeated below for convenience, for instance, shows two clause orders, i.e., a sentence-initial conditional clause, and a sentence-final conditional clause.

(4) If I want to lose weight, then I *should* not eat yet another piece of cake.

(5) Peter *will* not go to the party if I am going.

In examples (4), (5) above, and (6) and (7) repeated below, we see the modal verbs *should*, *will*, and *would*, and *must* respectively.

(6) If the train *would* have been on time, I *would* have been at the office already.

(7) If his wife died, he *must* be a widower.

While modality in conditionals too has been researched extensively, differences in clause order and other grammatical features, such as the presence or absence of *then*, have attracted less attention, and they have not been studied together at a large scale. As we will discuss below in section 1.3, it can be expected that differences in grammatical form systematically correspond, on some level, to differences in interpretation. If we indeed assume, for now, such a systematic relation between meaning and form, the second question introduced at the start of this section becomes more specific: to what extent are the grammatical form and the meaning of conditionals in natural language related? To be able to address this question sufficiently, I will discuss the theoretical background next in section 1.3.

1.3 Theoretical background

In the previous section, I described the use of conditionals in natural language in preliminary terms of meaning and form. The study of these two linguistic aspects of conditionals, and especially their relation, will guide the research presented in this dissertation. Before addressing the question of how the meaning and form of conditionals are related in natural language in detail in the next chapters, I provide a brief description of the theoretical framework used to pursue an answer.

The first question concerns the meaning of conditionals. In this dissertation, I take 'meaning' to include more than truth-conditional semantics alone. In Gamut's (1991, p. 195) words, 'there are aspects of meaning which lie beyond

the reach of logical semantics'. In chapter 2, I address this issue in great detail using the pragmatic framework of implicatures, presented in Grice's seminal work 'Logic and Conversation' (1975), in which he laid the groundwork for analysing meaning beyond the evaluation of statements as true or false. Grice developed his framework of implicatures to account for aspects of meaning that fall out of the scope of truth-conditional logic. In order to account for differences between logic and language, such as those discussed in the previous section, but without sacrificing the logical analysis of natural language, Grice (1989, p. 24) introduced the term 'implicature' to refer to what is 'implied, suggested, meant' instead of what was explicitly said. Semantics, in this view, resides in the analysis of meaning in terms of a truth-conditional evaluation of what was said, whereas pragmatics deals with implicatures, i.e., those aspects of meaning that fall beyond truth values (see e.g., Ariel, 2010, Chapter 1). A classic example, adapted from Grice (1989, p. 8) in (15), makes this clear.

(15) He took off his trousers and got into bed.

In a truth-conditional analysis, the conjunction *and* is identical to its logical counterpart $\wedge$. In logic, $\wedge$ is non-commutative, meaning that $p \wedge q$ and $q \wedge p$ are, by definition, true under exactly the same circumstances. If we reverse the order of statements in (15), however, as in Grice's original example reproduced in (16) below, the temporal order of the subject first taking off his trousers and then getting into bed is lost.

(16) He got into bed and took off his trousers. (Grice, 1989, p. 8)

In a purely logical analysis, the evaluations of (15) and (16) are identical, whereas in natural language, the two are clearly different (see also Grice, 1989, Chapter 1; Birner, 2013, p. 41; Blakemore & Carston, 1999). The temporal order in (15) is, in Grice's terms, implicated: it is non-truth-conditional meaning, but it is still meaning ('it is part of the meaning, or part of *one* meaning, of "and" to convey temporal succession' Grice, 1989, p. 8). Such implicatures can be conventionally attached to linguistic forms, or context-dependent to varying degrees.

The phenomena Grice (1989, p. 8) was famously interested in were those 'expressions which are candidates for being natural analogues to logical constants and which may, or may not, "diverge" in meaning from the related constants (considered as elements in a classical logic, standardly interpreted)'. Returning to the topic of conditionals, we can already begin to see how the discussion of 'added meanings' in the previous section points to the fact that *if* in natural language and $\supset$ in logic constitute such a pair of operators 'diverging' in meaning. Although truth-conditional and non-truth-conditional analyses are often presented as conflicting or incompatible analyses (see below and the next chapter), this small example shows how a pragmatic analysis of natural language may help to identify various meaning aspects, without ignoring either its truth-conditional, or its non-truth-conditional components, as is explicitly argued for by Boogaart and Reuneker (2017, pp. 203–204). In this study, I use

the term 'meaning' to include both truth-conditional and non-truth-conditional meaning, and the term 'implicature' to refer to those aspects of meaning that are non-truth-conditional.[5] Although many advantages have been made in the field of pragmatics since Grice's initial contributions, in a considerable number of theories his original ideas still hold, most notably in the accounts by Horn (1984) and Levinson (2000). In this dissertation, I will only resort to specific frameworks of pragmatics in case they are needed for the discussion at hand, and significantly contribute to the analysis. This is not because I deem Grice's theory superior necessarily, but because it is widely known within linguistics and thus serves a broad audience of readers.

The second question concerns the form of conditionals, and evenly importantly, its relation to meaning. To analyse these two dimensions of natural language, I will use the framework of Construction Grammar, (see e.g., Fillmore, Kay & O'Connor, 1988; Goldberg, 1995; Croft & Cruse, 2004, Chapters 9-11; Verhagen, 2005). The central idea in this framework is that the meaning, in the broad sense discussed above, and the form of linguistic utterances should not be studied in isolation, but in unison. In construction grammar, 'grammatical units', ranging from morphemes (cf. Booij, 2018) to complete phrases (cf. Goldberg, 1995), are fundamentally symbolic, i.e., they are 'pairings of grammatical form and the corresponding meaning or semantic structure', and as a consequence, they involve correspondence relations between form and meaning, or 'symbolic links' (cf. Croft & Cruse, 2004, p. 260). Constructions are, in other words, 'conventionalised pairings of form and meaning' (cf. Boogaart, 2009, p. 230). Next to this first principle (i.e., constructions are of a fundamentally symbolic nature), Croft and Cruse (2004, Chapter 10) opt for two other essential principles of construction grammar. The second principle is that all grammatical knowledge can be represented as such constructions, from general patterns such as Argument Structure Constructions, which determine the basic clause types of a language 'and constrain the interpretation of "who did what to whom"' (Goldberg, 1995, Chapter 1; Goldberg, 2019, Chapter 3), to more specific patterns found in grammar, such as the '*way* construction' e.g., 'Pat pushed her way out of the room' (Goldberg, 1996, p. 29; Israel, 1996; Verhagen, 2003), caused motion constructions, e.g., 'Pat sneezed the napkin off the table' (see again Goldberg, 1995, p. 3; and e.g., Kemmer & Verhagen, 1994), and ditransitive constructions, e.g., 'Pat faxed Bill the letter' (see Goldberg, 1995, p. 3; and e.g., Colleman, 2009). The third principle, finally, is that such constructions are not stored in isolation, but in relation to each other through inheritance hierarchies. More specific constructions are stored lower in the taxonomy and inherit properties of their more abstract parent constructions, which reside higher in the taxonomy of constructions, while adding syntactic and semantic properties at their own level in the taxonomy. Our grammars, in this sense, are 'more like a map than a shopping list' (cf. Michaelis & Lambrecht, 1996, p. 216).

[5] In chapter 2, these and related terms will be addressed explicitly and in more detail.

As I mentioned briefly already, and as I will discuss in more detail in the next chapter, the study of conditionals has focused for a large part on the meaning of the conjunction *if*. From the perspective of construction grammar, however, it makes sense to take into account the complete form of a conditional, i.e., its grammar, including not only the lexical element *if*, but also the fact that, as a conjunction, it combines two clauses, each with their own syntactic and semantic properties (see Dancygier & Sweetser, 2005, pp. 7–15; Boogaart & Reuneker, 2017, pp. 201–204; Iatridou, 2021). In this view, the meaning of a conditional is not solely attributed to *if*, but also to the formal properties of the two clauses the conjunction connects, including tense, as we saw above, clause order, modal marking, use of resumptive *then*, and, for instance, focus particles such as *only* or *even*. Furthermore, as discussed above, in this dissertation the concept of meaning is taken to include both truth-conditional and non-truth-conditional meaning. As truth-conditional approaches to meaning in formal semantics, and (inter)subjective approaches to meaning in construction grammar, and in cognitive linguistics in general, are often seen as fundamentally different (see chapter 2), it is necessary to briefly discuss the combination of both approaches to language as proposed in this dissertation. There is, as Israel (2011, p. 19) argues, no *a priori* conflict between truth-conditional semantics and construction grammar. Construction grammar is, in principle a 'non-modular' theory, as 'semantics, information structure, and pragmatics are interrelated; all play a role in linguistic function. Such functions are part of our overall conceptual system and not a separate modular component' (Goldberg, 2013, p. 16; see also e.g., Fillmore, 1985; Lakoff, 1987; Langacker, 1987), and as such construction grammar 'does not distinguish between semantics and pragmatics as two separate and autonomous modules that are in systematic interaction with each other' (Finkbeiner, 2019, p. 173). As both types of meaning, i.e., semantics and pragmatics, are part of one conceptual system (Langacker, 1987; referred to in Finkbeiner, 2019, p. 173), in construction grammar, it is customary to pursue a combined analysis without distinguishing between these types of meaning (see for discussion e.g., Leclercq, 2020), but it is, in my view, equally viable to pursue a combined analysis which is explicit in its treatment of those types of meaning, without necessarily positing two separate systems. Israel (2011, p. 16), argues, following Kay (1990), that 'the conventional content of a construction can include constraints on its use', i.e., the meaning of a construction may include contributions to both truth-conditional meaning, and to non-truth-conditional meaning. What is coded by a construction (see below) can put constraints both on 'the expressed propositional content' and on 'the kinds of contexts in which an expression can be used' (i.e., non-truth-conditional meaning; Israel, 2011, p. 18). In his analysis of scalar operators, such as *any*, *ever* and *some*, Israel shows that their contributions are not 'always evident in their truth-conditional effects', as can be seen in comparing (17) and (18) below.

(17) None of my friends use heroin. (Israel, 2011, p. 166)

(18) None of my friends *ever* use heroin. (Israel, 2011, p. 166)

Language users, however, Israel (2011, pp. 166–167) argues, have strong intuitions about meaning differences between utterances with and without these operators. This suggests that linguistic units such as constructions may have different types of meaning. Israel (2011, p. 19) mentions that 'while many formal semanticists have perhaps paid too little attention to the subjective and intersubjective aspects of meaning, it is equally true that some cognitive linguists have tended to scant its objective and referential aspects'. While it would go too far to discuss this point in more detail in this introduction, I will treat grammatical constructions as linguistic means for carrying both truth-conditional meaning and non-truth-conditional meaning, and, in order to be analytically and terminologically clear, I will analyse these meaning aspects by using Grice's distinction between 'what is said' and 'what is implicated'. We will come back to this point extensively in the next chapters (especially in sections 2.3 and 2.4), and I will further address the question of where to situate different types of meanings in grammatical constructions in the final discussion in chapter 7 (see section 7.4). For now, it is important to note that the combined approach proposed enables an analysis in which both semantics and pragmatics play a role, in order to test to what extent implicatures frequently licensed by grammatical features of conditionals become, to a certain degree, conventionalised as grammatical constructions. This, in a nutshell, is what I strive to find out in this dissertation.

From chapter 2 onwards, I will offer a more detailed account of conditionals in terms of pragmatics and construction grammar, but I hope to have shown already how such an approach can be fruitful in the analysis of conditionals in natural language, and consequently, in answering the question to what extent the form and meaning of conditionals in natural language are related.

1.4 Data and methodology

A general research question and theoretical framework do not yet enable the study of conditionals in natural language. For that, we need actual natural language data. As both pragmatics and construction grammar stress the importance of language in use and in context (see e.g., Blakemore, 2002, Chapter 1; Ariel, 2008, Chapter 1; Rühlemann & Aijmer, 2015), I will adopt a 'usage-based' approach to the study of conditionals, for which I provide a number of arguments in this section.

As discussed above, grammatical constructions are form-meaning pairings which have conventionalised by means of the general cognitive ability of categorisation. Langacker (1988a, p. 131), who coined the term '"usage-based" model of language structure', argues for a 'bottom-up' approach to language, in which linguistic utterances, just like other experiences, are individual events that are produced and perceived by language users. In perception, these individual usage events will show similarities to other linguistic events, as well

as differences, and by comparing between usage events, language users employ their cognitive abilities to categorise them into more general categories (see e.g., Lakoff, 1987; Verhagen, 2009; Harnad, 2017). Linguistic utterances showing many similarities frequently form the basis for more robust cognitive categories in which the form of the utterance and its function or meaning are stored. In other words, 'the factors that produce the phenomena to be explained are in a very fundamental sense aspects of the use that human beings make of language' (Verhagen, 2005, p. 24). In this view, there is no fundamental difference between grammatical rules and the 'word list' or lexicon (cf. Fillmore, Kay & O'Connor, 1988; Goldberg, 1995). As Goldberg (2019, p. 73) explains in detail in her recent work, learners of a language create 'lossy memory traces of formal patterns and their associated messages-in-context' first, then new traces are related to existing traces, which create 'emergent clusters' of both form and meaning aspects of an utterance. These clusters, then, are constructions, 'learned pairings of form and function', which become strengthened and more easily usable when newly experienced linguistic events, both in comprehension and production, overlap with existing clusters, and the construction becomes more variable with each variation. Finally, novel expressions are based on combinations of existing constructions.[6] Although this dissertation does not focus on language acquisition, the key here is that in this view on language, all linguistic knowledge consists of form-meaning pairings based on the entrenchment of actual language use (see also Schmid, 2020). Therefore, given the questions this dissertation strives to answer, it is actual language use, i.e., specific linguistic events, that should form the empirical basis for the analysis of conditionals.

The usage-based approach to language I opt for in this study is a theoretical choice, but it also has methodological consequences, i.e., it strongly suggests a corpus-based methodology (for introductions and overviews, see e.g., Biber, Conrad & Reppen, 1998; Baker, Hardie & McEnery, 2006; Gries, 2009, Chapter 2; McCarthy & O'Keeffe, 2012; McEnery & Hardie, 2012). This means that, after the theoretical part of this dissertation, from chapter 4 onwards, I will use recorded and stored language data to inspect both the grammar and meaning of conditionals. I will construct a corpus of Dutch conditionals for a language specific corpus study, mainly because I believe a language-specific study is needed (see section 4.3.2 for arguments), and because I agree with Verhagen (2005, p. 25), who argues 'that a deep understanding of details and subtleties [of the native language] is required to make discourse data bear on theoretical issues' (see also Verhagen, 2000). The qualitative analysis of conditionals will be informed by ample discussion of the literature available in chapters 2 to 5, and examples of conditionals are, of course, analysed in detail.

[6] See Goldberg (2019, Chapter 4) for a much more elaborate discussion of the creativity of language.

For the substantial quantitative part of the research needed to answer the questions central in this dissertation, a fairly large amount of linguistic data needs to be analysed. Standard techniques from descriptive and inferential statistics will be used in chapter 5 to report on the individual distributions of grammatical features of conditionals in Dutch. In order to identify 'patterns of use' of conditionals, i.e., grammatical features of conditionals and their contributions to meaning, I employ several machine-learning techniques, most notably clustering algorithms, in chapter 6. The relation to the 'emergent clusters' mentioned by Goldberg above is not straightforward necessarily (see chapter 6), but clustering conditionals on the significant co-occurrence of formal (grammatical) features does relate to the formation of constructions in learning a language. In this sense, a construction is viewed as a 'probabilistic association between syntactic and semantic properties' (cf. Alishahi & Stevenson, 2008, p. 829; see also Beekhuizen, 2015, Chapter 2), to which I will come back in chapter 6.

1.5 Contributions to the linguistic study of conditionals

Now that the subject, main aim, theoretical background and methodology of this study are introduced, I would like to address briefly the envisioned contributions of this dissertation to the field of linguistics in general and the study of conditionals specifically, before introducing the structure of this dissertation in section 1.6.

This study aims to contribute to the study of conditionals, and the field of linguistics in several ways. First, it offers a detailed analysis of conditionals in which a truth-conditional approach, and a non-truth-conditional approach are combined to identify clearly the different meaning aspects of conditionals in natural language (chapter 2). As such, I hope it will not only contribute to the study of conditionals, but also to the study of semantics and pragmatics in general. Second, this dissertation provides an analysis of conditionals in which the study of their meaning and form are combined using the approach of construction grammar outlined above. Whereas many studies on conditionals have focused the meaning of *if* and the contribution of a small number of grammatical features, this study systematically investigates the contribution of other grammatical properties of conditionals suggested to be of influence in the literature (chapter 5), including such features as clause order, syntactic integration and the sentence type of the consequent. Third, an extensive and thorough overview of classifications of conditionals is offered (chapter 3). This overview ranges from studies of conditionals in classical Greek, to recent attempts at explaining different uses of conditionals. As the body of literature on conditionals is vast, an overview focused on finding types of conditionals and their grammatical features creates a novel inventory of linguistic accounts of conditionals. Fourth, this study investigates conditionals in Dutch corpus data,

both from the spoken and written mode, whereas available studies largely focus on conditionals in written English (chapters 4 to 6). This dissertation offers a language-specific analysis of Dutch conditionals, and an extensive, corpus-based overview of the grammar of Dutch conditionals (chapter 5). This includes an account of data annotation, together with annotation guidelines, and a systematic approach to optimising annotation reliability, adhering to the principle of 'total accountability' (cf. McEnery & Hardie, 2012, p. 14), which, despite several suggestions in the literature (see e.g., Krippendorff, 2004; Spooren & Degand, 2010; Artstein & Poesio, 2008; Bolognesi, Pilgram & van den Heerik, 2017), is still not standard practice in the field. As the grammatical features included in this study are suggested in the literature on English conditionals mostly, this dissertation also offers a contrastive analysis of the grammar of Dutch and English conditionals. Fifth and final, this dissertation offers a novel methodological approach to investigating the relation between grammar and meaning. It uses a combination of in-depth pragmatic analysis to construct hypotheses about conditional constructions, and applies both proven and state-of-the-art machine-learning techniques for clustering data on a carefully balanced corpus of Dutch conditionals.

These contributions need, of course, to be borne out by the research itself. Therefore, we return to them in the last chapter, chapter 7.

1.6 Structure of this dissertation

To answer the questions introduced in section 1.2 above, I will start this dissertation by discussing existing analyses of conditionals in chapter 2. In that chapter, I focus on the pragmatics of conditionals, i.e., those meaning aspects that lie beyond standard logic-oriented analyses of conditionals. Based on the discussion of the relevant literature, I present a preliminary analysis of their non-truth-conditional meaning in terms of two implicatures, namely those of 'unassertiveness', and those of 'connectedness'. I will also address the issue of the degree of conventionalisation of these implicatures, which is highly relevant, because it connects the approaches of pragmatics and construction grammar in this dissertation. The implicatures mentioned will structure the discussion of accounts of conditionals from various sub-disciplines in linguistics, which I will present in chapter 3. This chapter discusses existing classifications of conditionals and serves two main purposes. First, it present an overview of classifications of conditionals in the literature. The overview is structured by the two implicatures mentioned above, and it is directed at uncovering the various implicatures that may be licensed by conditionals in natural language. Second, it provides an overview of grammatical features of conditionals that the literature suggests to be related to these implicatures. After introducing and discussing the data selection, arguments for a language-specific study, the corpus set-up, and quantitative analyses in chapter 4, I present a corpus-based inventory of the grammatical features of Dutch conditionals in chapter 5. This

chapter too serves a dual purpose. First, it provides an overview of the grammar of Dutch conditionals, and second, it describes the distributions of features that serve as input for the clustering of conditionals presented in chapter 6. In this latter chapter, I present a novel approach to identifying conditional constructions using clustering techniques and the framework of construction grammar to explore the extent to which the grammar of conditional constructions (form) influences their specific implicatures (meaning). Finally, in chapter 7, I will offer a final conclusion based on the results presented in this dissertation, and I will discuss their implications for the analysis of conditionals in natural language, both from a theoretical and a methodological standpoint.