Cognitive and interactive aspects of task-based performance in Dutch as a second language

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Chapter 2

The studies in this book

The aim of this chapter is to give an overview of the research presented in this book as a whole. First, it frames the goal of this book and summarizes the theoretical claims under investigation. Second, it formulates the research questions and hypotheses that guide the present research. Finally, the overall design, population, and measures of the experimental investigations in chapters 3, 4, and 5 are presented.

At this point it is important to ascertain that the different investigations mirror the growth of this work as a whole, that is, study 1 (presented in chapter 3) yielded methodological insights that were used to improve the investigation of study 2 (presented in chapters 4 and 5). Chapter 5 itself is a follow-up of chapter 4 as it evaluates the same data set but elaborates the analysis by means of global CAF-measures of task performance (which was reviewed in chapter 4) by examining a task specific measure in chapter 5. These growing insights account for the fact that the predictions, for example, from chapters 3 and 4 show some differences. They reflect the chronological stages of the work presented in this book.

Furthermore, the reader may be reminded that the empirical chapters are intended as individual scientific papers that have been or will be published outside the context of this book. Therefore, they show some overlap in their content, especially when reviewing the theoretical framework or when explaining the design of the experimental investigations.

2.1 Goal

The goal of the studies presented in this book is to investigate the claims of the Cognition Hypothesis by Robinson (1995b, 2001a, 2001b, 2003b, 2005) with respect to the effects of cognitive task complexity and interaction. Furthermore, this book explores whether there are any combined effects of these two factors on the oral task-based performance of L2-learners. In addition, it evaluates the use of task specific measures as a complement to global CAF-measures and the added value of a native speaker baseline.
2.2 The claims under investigation

As discussed in section 1.4.3 the fundamental claim of the Cognition Hypothesis (Robinson 2005) is that so-called resource-directing factors of cognitive task complexity (e.g., ± few elements) are able to focus the L2-learner’s attention towards task relevant linguistic aspects such that task performance becomes linguistically more complex than upon simple tasks. As L2-performers can rely on multiple attentional pools (Wickens 2002, 2007) accuracy does not suffer from the increased cognitive complexity. Rather, cognitively complex tasks have the potential to also promote accuracy because L2-learners attention is focused to form. Consequently, cognitively complex tasks may foster a parallel increase of linguistic complexity and accuracy at the cost of fluency.

As section 1.3.4 revealed, the Limited Attentional Capacity Model predicts a different outcome of task manipulations by means of cognitive factors of task complexity (Skehan 1996, Skehan and Foster 2001). Crucially, Skehan and Foster expect trade-off effects between dimensions of task performance, in particular between linguistic complexity and accuracy, upon cognitively complex tasks.

As explained in section 1.4.4 the Cognition Hypothesis does not make overt predictions with regard to effects of the factor ± monologic. However, following the claims concerning the interactive factor of task condition one–way / two–way flow of information (Robinson 2001a, 2003b, 2005) and the literature on interaction (e.g., Long 1990) it was assumed that an interactive task reduces linguistic complexity and fluency but pushes the accuracy of L2-performance. This follows from the fact that in a dialogue mutual understanding is crucial so that both L2-participants may focus their attention towards form. This increased attention results in a higher accuracy of speech production at the cost of fluency in dialogues. As speaking partners ask each other for clarification and give feedback, speech production in interaction presumably is linguistically less complex than monologic task performances, because turn-taking behavior prevents speakers from building elaborate syntactic constructions.

An alternative perspective on the factor ± monologic would predict a slightly different effect of dialogic tasks (see section 1.6.2 and Costa et al. 2008, Pickering and Garrod 2004, Tavakoli and Foster 2008). These accounts assume that dialogues are cognitively less demanding than monologues and therefore may expect interactive task settings to push accuracy and fluency while linguistic complexity may decrease due to routinization in alignment.

The intriguing claim by Robinson (2001b, 2003b, 2005) concerns a combination of the cognitive and interactive factors of task design. As cognitively complex tasks may need more clarification work than simple tasks do, cognitively complex interactive tasks may yield more interaction than cognitively simple interactive tasks. Accordingly, the linguistic complexity in cognitively complex interactive tasks may be decreased. In contrast, both factors – increased cognitive task complexity and the interactive task setting – will push accuracy and reduce fluency. In sum, Robinson’s theory predicts cognitively complex interactive tasks to yield L2-speech of a low linguistic complexity and fluency but a high accuracy.
Table 2.1: Predicted effects of task complexity and interaction of the present studies

<table>
<thead>
<tr>
<th>MEASURE</th>
<th>TASK COMPLEXITY</th>
<th>INTERACTION</th>
<th>TASK COMPLEXITY</th>
<th>INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>complex</td>
<td>dialogue</td>
<td>complex</td>
<td>dialogue</td>
</tr>
<tr>
<td>L2-LEARNERS</td>
<td>ling. complexity</td>
<td>↑</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>accuracy</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>fluency</td>
<td>↓</td>
<td>↑</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>L1-SPEAKERS</td>
<td>ling. complexity</td>
<td>≈</td>
<td>↓</td>
<td>≈</td>
</tr>
<tr>
<td>accuracy</td>
<td>≈</td>
<td>≈</td>
<td>≈</td>
<td></td>
</tr>
<tr>
<td>fluency</td>
<td>≈</td>
<td>↑</td>
<td>≈</td>
<td></td>
</tr>
</tbody>
</table>

Note. ↑ = increase; ↓ = decrease; ↑↑ = large increase; ↓↓ = large decrease; ≈ = no effect; L2 = second language; L1 = first language; ling. complexity = linguistic complexity; a As there are no different predictions for structural and lexical complexity, the two sub-dimensions are combined into the single measure 'linguistic complexity' in this table.

Table 2.1 gives a graphical summary of the predictions of the present book that are based on a combination of the different claims listed above.¹

As Robinson’s predictions concerning effects of cognitive task complexity are clearly stated the studies in this book follow the Cognition Hypothesis: Cognitively complex tasks manipulated on a resource-directing factor results in higher linguistic complexity and accuracy, at the cost of fluency (see Table 1.2 and Robinson 2001b, 2003b, 2005).

With respect to the interactive factor ± monologic the present studies combine the different perspectives put forward: Dialogues are expected to yield a higher accuracy but a lower linguistic complexity than monologues as both the Cognition Hypothesis and e.g., the Alignment Hypothesis support this prediction. Concerning the contrasting accounts with respect to fluency, the empirical investigations in this book follow the alternative perspective, that is, fluency is expected to be pushed by a dialogic task setting. The rationale behind this choice is first, that as mentioned in section 1.4.4 the Cognition Hypothesis makes no overt statements about the factor ± monologic. Second, the predictions of the alternative accounts advocate a processing oriented perspective on L2-performance, which seems to be appropriate considering the performative nature of the measure of fluency.

Concerning combined effects of cognitive task complexity and interaction this book assumes that manipulating cognitive task complexity (e.g., the factor ± few elements) generates a smaller effect than manipulating interaction (e.g., the factor ± monologic). The rationale follows from the intuition that the effect of interaction on task-based L2-performance is quite strong. That is, whether someone acts on his

¹Note, that this table accordingly expects a slightly different outcome than the Cognition Hypothesis, in particular with respect to effects of interaction as compared to Table 1.2 on page 25.
own or whether two speakers interact has a large impact on L2-performance. In contrast, the difference between cognitively simple and complex tasks on the resource-directing factor (± few elements) may be of a small nature only.\(^2\)

When combining the predictions with respect to cognitive factors of task complexity and interactive factors of task condition the present book therefore expects that the pushing or reducing effects of interaction (marked by double arrows \(\uparrow\) or \(\downarrow\)) may successfully mitigate against counter influences of cognitive task complexity (expressed by a single arrows \(\uparrow\) or \(\downarrow\)).\(^3\) Consequently, cognitively complex interactive tasks are expected to yield speech productions of a lower linguistic complexity, but a higher accuracy and fluency than cognitively simple interactive tasks, or any task in a monologic setting.

Last but not least, although the Cognition Hypothesis presents itself as a theory on task performance by L2-learners, the table shows predictions for native-speaker performance too. Chapters 4 and 5 include L1-speaker data as a baseline. For L1-speakers, no effects of cognitive task complexity are expected. As explained in section 1.6.4 native speakers rely on mostly automatic speech processes (Levelt 1989) and therefore may not be affected by a higher cognitive task complexity as manipulated in the present studies. Effects of interaction though are expected to similarly influence L1-speakers and L2-learners. After all, effects of turn-taking and alignment may hold for both populations, though the impact may be smaller in natives than in non-natives (Costa et al. 2008, Pickering and Garrod 2004). See chapters 4 and 5 for a more elaborate discussion of the predicted effects on native speakers’ task performance.

### 2.3 Research questions and hypotheses

The following research questions and hypotheses guide the empirical investigations of the present work:

**Research Question 1**

What is the effect of increased cognitive task complexity on L2 oral task performance?

**Hypothesis 1**

Increased cognitive task complexity results in higher accuracy and higher linguistic complexity, but lower fluency of L2 oral task performance.

**Research Question 2**

What is the effect of interaction on L2 oral task performance?

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\(^2\)Earlier work of Gilabert (2005) gives support to this assumption as in this study the resource-directing factor ± here-and-now showed smaller effects on task performance than the resource-dispersing factor ± planning time.

\(^3\)N.B. this symbolism by single and double arrows does only assume ‘larger’ effects of interaction but not that it doubles the impact of cognitive task complexity.
Hypothesis 2
Interactive tasks raise the accuracy and fluency of L2 oral task performance while linguistic complexity decreases.

Research Question 3
Are there any combined effects of increased cognitive task complexity and interaction on L2 oral task performance?

Hypothesis 3
Increased cognitive task complexity enhances interaction and therefore further decreases the linguistic complexity of cognitively complex interactive task performances. They increase the accuracy and fluency of L2 oral task performance.

L2 oral task performance is evaluated by means of global measures of linguistic complexity, accuracy, and fluency in chapters 3 and 4. In addition, chapter 5 evaluates the speech performances by means of a task specific measure (the use of conjunctions). Moreover, although the data collection focuses on L2-learners’ task performance, chapters 4 and 5 include a group of native speakers as a baseline. These two elaborations generate two more questions and hypotheses:

Research Question 4
What is the effect of increased cognitive task complexity on the frequency and occurrence of conjunctions in L2 oral task performance?

Hypothesis 4
Increased cognitive task complexity leads to an increase in the frequency and occurrence of conjunctions in L2 oral task performance.

Research Question 5
What are the effects of increased cognitive task complexity and interaction on their own as well as in combination on L1 oral task performance in contrast to L2 oral task performance?

Hypothesis 5
Increased cognitive task complexity does not affect the highly automatic oral task performance of L1-speakers. Accordingly, no combined effect of cognitive task complexity and interaction is expected. In contrast, interaction shows similar but smaller effects on L1-speakers than on L2-learners.
Table 2.2: Experimental design of the present studies

<table>
<thead>
<tr>
<th>TASK COMPLEXITY (within participant)</th>
<th>INTERACTION (between participants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>simple</td>
<td>CONDITION 1</td>
</tr>
<tr>
<td>+ few elements</td>
<td>+ monologic</td>
</tr>
<tr>
<td>+ monologic</td>
<td></td>
</tr>
<tr>
<td>complex</td>
<td>CONDITION 2</td>
</tr>
<tr>
<td>– few elements</td>
<td>– monologic</td>
</tr>
<tr>
<td>+ monologic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONDITION 3</td>
</tr>
<tr>
<td></td>
<td>+ few elements</td>
</tr>
<tr>
<td></td>
<td>– monologic</td>
</tr>
<tr>
<td></td>
<td>CONDITION 4</td>
</tr>
<tr>
<td></td>
<td>– few elements</td>
</tr>
<tr>
<td></td>
<td>– monologic</td>
</tr>
<tr>
<td></td>
<td>+ monologic</td>
</tr>
</tbody>
</table>

2.4 Design

Based on the Triadic Componential Framework (Robinson 2005) the present studies investigate effects of an increased cognitive task complexity by means of the factor ± few elements. Furthermore, they explore effects of the manipulation of the interactive factor ± monologic.

Both factors are systematically examined on their own as well as in combination. In a 2×2 design cognitive task complexity is implemented within participants and interaction between participants. This generates the four different conditions depicted in Table 2.2: (1) cognitively simple monologic (+ few elements / + monologic), (2) cognitively complex monologic (– few elements / + monologic), (3) cognitively simple dialogic (+ few elements / – monologic), and (4) cognitively complex dialogic (– few elements / – monologic).

Task design and setting are operationalized such that the empirical investigations singled out these two factors. Great effort was taken to control or counterbalance all other factors named in Robinson’s Triadic Componential Framework (see Figure 1.1). For example, visual and linguistic input material of the task instructions are kept as similar as possible. Pre-task and online planning time, gender, and language background are controlled over participants and tasks. As the investigations use large groups of participants inequalities due to individual differences on learner factors may be overcome by group means.

2.5 Participants

The data collection took place from May to October 2006 (study 1) and from September 2007 to January 2008 (study 2). The experimental group of participants of the present investigations are adult learners of Dutch as a second language who had their first contact with Dutch after puberty. Table 2.3 summarizes the background information for all the participants that contributed to the studies presented in this book.

In the first study there were 44 and in the second study 64 L2-learners respectively. They were all of Turkish or Moroccan background. This was thought to simplify the data collection of two homogeneous
Table 2.3: Background information for all participants of the present studies

<table>
<thead>
<tr>
<th></th>
<th>AGE</th>
<th>GENDER</th>
<th>LANGUAGE PROFICIENCY</th>
<th>STAY IN THE NETHERLANDS&lt;sup&gt;a&lt;/sup&gt;</th>
<th>ORIGIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>m</td>
<td>f</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>study 1</td>
<td>L2-LEARNERS</td>
<td>44</td>
<td>27.7 (6.4)</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>study 2</td>
<td>L2-LEARNERS</td>
<td>64</td>
<td>27.6 (6.2)</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>L1-SPEAKERS</td>
<td>44</td>
<td>20.6 (3.5)</td>
<td>9</td>
<td>35</td>
</tr>
</tbody>
</table>

Note. SD = Standard Deviation; m = male; f = female; <sup>a</sup> in years; Tur = Turkish; Mor = Moroccan; <sup>b</sup> participants performed on a cloze task where every eleventh word was eliminated with a total of 50 gaps; <sup>c</sup> in eight short texts participants had to choose among three possible words at a gap with a total of 100 gaps.  

learner groups as these form the two largest immigrant populations in the Netherlands (i.e., about 4% of the Dutch national population is constituted by Turks and Moroccans, with the former group slightly outnumbering the latter, CBS 2010).<sup>4</sup>  
The participants were recruited from different language institutes in the Netherlands, mostly in Amsterdam but partially also in Utrecht and the surrounding cities. According to a background information questionnaire they had resided in the Netherlands on average since three and a half years (see Appendices A.3, B.2). As they were attending or had just finished higher education most of them were in their twenties. All were attending classes for students with a higher educational background. At the moment of testing they were about to take or just had taken the State Examination for Dutch as a second language. Accordingly, they were classified by their teachers to be at an intermediate level of proficiency (i.e., level B1/B2 of the Common European Framework of Reference for Languages (CEF), Witte and Mulder 2006). In both investigations their estimated level was assessed by a written proficiency task. In study 1 this was a cloze task where every eleventh word was eliminated with a total of 50 gaps (see Appendix A.1 and A.2). Study 2 used a word choice task with a total of 100 gaps (see Appendix B.1).<sup>5</sup>  
This revealed that participants of the first study were at lower intermediate levels while participants of the second study were at a slightly higher intermediate level.  
The second data collection included a control group of 44 native speakers who performed the same tasks under the same conditions as the non-native participants.<sup>6</sup> These L1-data established a baseline for the empirical work presented in chapters 4 and 5. The native speakers were mostly students at the

<sup>4</sup> N.B. None of the investigations explicitly explores differences between these two populations. After all, cognitive approaches to task-based L2-performance would not assume Turkish learners of Dutch to act differently on cognitively complex or simple monologic and dialogic tasks than Moroccan L2-learners of Dutch.  
<sup>5</sup> I thank the Language Center of the University of Groningen that uses this task as a placement test for their language courses.  
<sup>6</sup> I thank Rachel Jobels for her help especially with respect to collecting the native speaker data.
The studies in this book

University of Amsterdam and on average a bit younger than the non-natives (as established by means of a background information sheet, see Appendix B.2). They scored at ceiling on the language proficiency task. In general, more females participated in the studies. Within the L1-group the different numbers of males and females is the largest.

2.6 Measures

The data analyses of the present work includes global and specific measures of performance. The first two investigations (chapters 3 and 4) use similar global measures of linguistic complexity, accuracy, and fluency. In order to avoid redundancy the CAF-constructs are carefully chosen based on the literature (cf. section 1.5).

The first study (chapter 3) evaluates 12 global measures of linguistic complexity, accuracy, and fluency. Based on these results the choice of measures was revised as correlational analyses revealed co-linearity of some of the measures. The second study (chapter 4) accordingly investigates 10 global CAF-measures. In order to complement these findings chapter 5 investigates the use of a task specific measure in the dataset of study 2.

Basic unit

As a basic syntactic unit of reference the studies presented in this book use the Analysis-of-Speech (AS)-unit by Foster et al. (2000) with some exceptions when measures are related to the number of words or time. For example, in the analysis by means of a task specific measure raw scores are corrected for sample length by calculating a ratio to 100 words rather than to the AS-unit. This is done because the specific measure (i.e., the use of conjunctions) may be related to any syntactic unit (see chapter 5 for a more elaborate explanation with respect to this point).

Linguistic complexity

The empirical investigations on global CAF-measures (chapters 3 and 4) take the basic distinction between structural and lexical complexity as a measure of linguistic complexity. The first investigation gauges syntactic complexity by means of two measures: the total number of clauses per AS-unit and by the Subordination Index, i.e., the ratio of subordinate clauses per total number of clauses. After reviewing the results and consulting the literature again (Norris and Ortega 2003, 2009a), co-linearity, and therefore redundancy, of these two measures was acknowledged.

The second investigation therefore used only the Subordination Index (in a slightly different form though: the number of subordinate clauses per AS-unit). This measure gives insight into the ability of participants to use complex syntax. It is thought to be most indicative for speakers at an intermediate
stage of L2-proficiency (Norris and Ortega 2009a). In addition, the number of words per clause is calculated as the mean length of clause serves as an indicator for complexity within a phrase (Ferrari 2009). Especially at higher levels of L2-proficiency and in native speech structural complexity may be most often expressed by phrase-internal complexification rather than by the use of more subordination or clauses (Norris and Ortega 2009a).

Following earlier work Guiraud’s Index is used as a global measure of lexical complexity for the empirical investigations in chapters 3 and 4 (Gilabert 2005, Guiraud 1954, Robinson 2001b). Guiraud’s Index is calculated by dividing the number of different types by the square root of the number of tokens. Taking the square root of the type-token ratio (TTR) is thought to correct for sample length and therefore Guiraud’s Index may be more appropriate than the TTR (Vermeer 2000).  

The first investigation uses a second measure of lexical complexity: the percentage of lexical content words related to the total number of words. This ratio is calculated in the tradition of earlier work (Gilabert 2005, Rahimpour 1997, Robinson 1995b). However, Vermeer (2000) does not consider the percentage of lexical words to be any more valuable than Guiraud’s Index. As redundancy due to co-linearity of measures needs to be avoided (Norris and Ortega 2009a), the second empirical investigation abandons the percentage of lexical words in favor of Guiraud’s Index as the latter is widely used in research investigating the Cognition Hypothesis.

**Accuracy**

The studies presented in this book use accuracy measures based on specific types of errors. This procedure was adopted in order to tap even slight differences of task performance and because the target participant population is at an intermediate level of language proficiency such that almost no error-free units are expected, while the native speakers of the second investigation may produce speech that consists for almost 100% of error-free units. The present work chose error categories following earlier research by van Daele (2007), Gilabert (2005), and Robinson (2001b).

The first study gives the total number of errors per AS-unit as a broad starting point. Furthermore, the number of lexical errors and the number of omissions (of articles, verbs, and subjects) are calculated. The second dataset is analyzed for lexical, morphosyntactic, and determiner errors. Both counts included a category of ‘other errors’, which turned out to be almost empty and therefore was excluded from statistical analyses.

For both investigations any word choice errors (e.g., forms in another language than Dutch, wrong prepositions) are classified as lexical errors. The second study redefined and partially split the category of ‘omissions’ of the first investigation into two categories: morphosyntactic and determiner errors. The former addresses non-target-like word order, omissions of obligatory constituents and other syntactic
problems as well as morphological failures on agreement and inflection. The latter counts any erroneous use or omissions of articles as well as mismatches on grammatical gender on determiners as ‘non-target-like use of articles’ (Gilabert 2005, Rahimpour 1997, Robinson 1995b). This change from the first to the second study is made because in the first study the category of ‘omissions’ to a large extent consisted of determiner errors. As the second study expects a similar kind of error pattern (participants are at broadly the same level and tasks are similar), determiners are singled out as an own measure such that it cannot ‘pollute’ the other categories.

Both studies furthermore calculate two measures with respect to self-repairs: the ratio of self-repairs in relation to the number of errors as well as the percentage of self-repairs related to the total number of words. Following Gilabert (2007a), who cites Kormos (1999), these measures are considered to be good reflections of the speakers’ ability to monitor the own speech. After classifying these measures in the first investigation as accuracy measures, the second study arranges them under what Tavakoli and Skehan (2005) call ‘repair fluency’. The explanation for this is given in the following paragraphs discussing fluency.

**Fluency**

In order to analyze the speech production for measures of fluency the investigations presented in this book rely mostly on work by van Daele (2007), Gilabert (2005), Mehnert (1998), and Yuan and Ellis (2003) and it uses the division into the three sub-constructs presented by Tavakoli and Skehan (2005). The first sub-dimension termed pausing or breakdown fluency concerns the amount, location, and duration of silence. It presumably reflects the planning and conceptualization phase of speech production. Both investigations calculate breakdown fluency by means of the number of filled pauses (e.g., uh, uhm) per hundred words. As in natural speech the number of silent and filled pauses correlates with each other using both would possibly lead to redundancy (Kormos and Dénes 2004). Practical reasons favored the counting of filled pauses rather than unfilled pauses.

The data are coded for two different measures of the second sub-dimension, i.e., speed. Both give an estimation of ‘how fast and dense the produced language is in terms of the time units’ (Tavakoli and Skehan 2005: 255). The ‘unpruned speech rate A’ is the ratio of all syllables produced per second or minute and sheds a light on how well a speaker can fill time with sound. The second speed measure, ‘pruned speech rate B’ is cleaned from reformulations, repairs and repetitions before relating the syllables to time. It accordingly is a measure of ‘meaningful’ speech per time unit.

The third sub-dimension of fluency is named repair fluency by Tavakoli and Skehan (2005). It refers to the amount of repetitions of exact words and phrases, reformulations, false starts, corrections and partial repeats. It gives insight into the speakers’ ability to monitor their own speech (Freed 2000, Gilabert 2005, 2007a, Gilabert et al. 2009, Kormos 1999, 2000a, b). Monitoring, and thus repair fluency,
are associated with the processes in the conceptualizer during speech planning (Levelt 1989).

Both investigations in the present work code for the number of self-repairs of errors and non-errors. The first investigation, however, associates self-repairs with accuracy rather than fluency following Gilabert (2005). Considering Tavakoli and Skehan’s (2005) construct of repair fluency, the second investigation revised this classification and gathers self-repairs under the construct of fluency.

The task specific measure

In addition to an analysis by means of global CAF-measures (see chapters 3 and 4), chapter 5 of this book presents data based on a task specific measure. This analysis is performed following a suggestion of Robinson and colleagues to complement global CAF-measures with task-specific ones (Cadierno and Robinson 2009, Robinson et al. 2009, Robinson and Gilabert 2007).

By definition, every investigation exploring task specific measures has its own specific measure. The present work examines the frequency and occurrence of conjunctions. The rationale behind it is that task-based production is elicited by means of argumentative tasks manipulated on the factor ± few elements. That is, both the cognitively simple and complex task ask for the balancing of reasons when choosing between several possible combinations among the elements. It is expected that the higher number of elements in the complex task may induces a higher number of arguments for or against an option. This increase in cognitive complexity is hypothesized to be reflected in linguistic structures and forms that are related to the balancing of reasons, e.g., conjunctions as lexical markers of argumentation. See chapter 5 for a more elaborate explanation and a detailed description of the specific conjunctions under investigation.

2.7 Concluding remarks

This chapter has introduced the empirical work by formulating the research questions and hypotheses that guide the present investigations. The subsequent chapters 3, 4, and 5 will elaborate on the actual empirical studies. On the one hand these chapters partially repeat the theoretical content because they serve as independent scientific papers. On the other hand, they further develop the theory based on their own data. In the process they therefore adapt some of the predictions concerning effects of cognitive task complexity and interaction presented so far. Finally, chapter 6 combines the theory (chapter 1) with the evidence (chapters 3 to 5) as it presents the general discussion and conclusion of the present book and relates them to the hypotheses formulated in this chapter.

8N.B. As discussed in section 1.4.6 Kuiken and Vedder (2007b) argue that an increase of cognitive task complexity on the factor ± few elements almost automatically increases the reasoning demands of a task too.

9There may be many other (e.g., lexical, syntactic, pragmatic) ways to linguistically mark a line of argumentation. For practical reasons, the work presented in this book limits itself to the investigation of conjunctions.