The Use of Conjunctions in Cognitively Simple versus Complex Oral L2 Tasks

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<ABSTRACT>

The present study explores the use of conjunctions in simple versus complex argumentative tasks performed by second language (L2) learners as a specific measure for the amount of reasoning involved in task performance. The Cognition Hypothesis (Robinson, 2005) states that an increase in cognitive task complexity promotes improvements in L2 performance. This effect should become particularly visible when task-specific performance measures are used (Robinson & Gilabert, 2007).

This article evaluates these claims by investigating the oral performance of 64 L2 learners on cognitively simple as compared with cognitively complex oral argumentative reasoning tasks. The analysis focuses first on the overall frequency and occurrence of conjunctions. Next, 5 conjunctions that are considered to be highly task-relevant are examined more closely.

Results are discussed in light of the speech production of 44 native speakers who performed the same tasks under the same conditions. The discussion addresses implications of the findings for the cognitive approach to task-based L2 research in light of Robinson's (2005) Cognition Hypothesis. From the standpoint of research methodology it highlights the benefits of native speaker data as a baseline for comparison.

<END ABSTRACT>

Keywords: SLA, Cognition Hypothesis, task-based production, task specific measures, argumentative reasoning

<A>THE USE OF CONJUNCTIONS IN COGNITIVELY SIMPLE VERSUS COMPLEX L2 TASKS

This article examines the use of conjunctions as a specific measure for evaluating the speaking performance of second language (L2) learners in simple and complex argumentative tasks. Adopting a cognitive perspective on task-based research, it investigates the predictions of the Cognition Hypothesis (Robinson, 2005), which claims that increased cognitive task complexity promotes the linguistic complexity and accuracy of an L2 learner's task performance at the cost of fluency. In an earlier study (Michel, 2011) that used global measures of linguistic complexity, accuracy, and fluency I had found only minor effects of cognitive task complexity on L2 performance. Presumably as a way of refining research on the Cognition Hypothesis, Robinson has recently proposed that L2 production should be evaluated by means of task-specific measures that would complement the traditional global measures (Cadierno & Robinson, 2009; Robinson, Cadierno, & Shirai, 2009; Robinson & Gilabert, 2007). The present work picks up on that suggestion in order to explore whether a task-specific measure would indeed provide more support for the predictive value of Robinson's Cognition Hypothesis in the environment of argumentative speaking.

<B>Cognitive Task Complexity and the Cognition Hypothesis

Research into second language acquisition (SLA) is interested in specifying what kind of instruction is most beneficial for fostering L2 learning. In the last two decades the task-based approach to SLA has received growing interest, an approach that advocates language learning and teaching by means of meaning-oriented tasks that allow L2 learners to use the target language in authentic situations while, at the

same time, task performance provides them with opportunities to focus their attention on the language form – something that became known as 'Focus on Form' in contrast to earlier methods, that focused more on formS, i.e., grammatical rules (Long & Robinson, 1989). By now, a considerable body of research has investigated the claims regarding the efficacy of task-based L2 performance. According to Ellis (2000) and Skehan (2003) at least two broad perspectives of task-based research have emerged in the past years: a socio-cultural perspective, that explores 'how learners co-construct meaning while engaging in interaction', and a cognitive strand, that 'focussed on the psychological processes typically engaged in when learners do tasks.' (Skehan, 2003: 5).

The present article situates itself within the cognitive approach – a fecund area of inquiry that investigates how a learner's cognitive processes and the allocation of attentional resources may be reflected in task performance and, in turn, in the measures used by researchers for gauging it, namely complexity, accuracy, and fluency (CAF). In particular, this cognitive strand explored the manipulation of a central task design characteristic, cognitive task complexity, in terms of two major hypotheses: Skehan's (1998, 2009) Limited Attentional Capacity or Trade-off Hypothesis and Robinson's (2005) Cognition Hypothesis. While both hypotheses see manipulation of task complexity as a way to promote L2 learners' attention to form during task performance, they diverge significantly in how they imagine the underlying processing mechanisms of L2 learners and how these affect the CAF dimensions of L2 performance, particularly with cognitively more complex tasks.

Specifically, Skehan's Trade-off Hypothesis assumes that learners' attentional capacity is limited, resulting in competing resource demands (Skehan, 1998; 2009;

Skehan & Foster, 2005). When task demands exceed the available attentional resources, as in cognitively complex tasks, trade-offs emerge that prevent a parallel increase of, for example, both linguistic complexity and linguistic accuracy.

By contrast, Robinson (2005) claims that if task complexity is increased along so-called 'resource-directing' task characteristics (e.g., ± reasoning-demands and ± few-elements), it is likely that linguistic accuracy and complexity are promoted in parallel. That is, more complex functional demands (e.g., an evaluation of many rather than a few elements) require more complex linguistic realizations (e.g., a wider range of argumentative markers, relative clauses and other types of subordination). As such, an increase in cognitive task complexity triggers more elaborate language use and pushes learners to adopt a 'syntactic mode' of processing as contrasted with a 'pragmatic mode' for where simple linguistic means suffice to complete a simple task (Givón, 1985). Contrary to the assumption of limited attentional capacity, L2 learners are taken to have access to different attentional pools that function independently of each other (Wickens, 2007). For that reason, cognitively complex tasks have the potential to push L2 production without having detrimental effects on accuracy and complexity.

By now, a considerable body of empirical work has corroborated the claims associated with the Cognition Hypothesis (Gilabert, 2007; Ishikawa, 2007; Kuiken & Vedder, 2007; Michel, 2011; Michel, Kuiken, & Vedder, 2007, Révész, 2009, 2011; Robinson, 2001, 2007a, 2007b), such that learners show a higher degree of accuracy or linguistic complexity when they complete a task with increased cognitive task complexity. Importantly, they seem to show no trade-off effects on the other measures.

However, upon closer inspection, the reported findings often harbour ambiguities or show limitations. For example, while Michel, Kuiken, and Vedder, (2007) found that both accuracy and linguistic complexity increased in tasks with higher cognitive complexity, this effect manifested itself on only one out of five accuracy measures and one out of four complexity measures. Similarly, Robinson's (2001) study yielded only a trend effect. Finally, the data from Kuiken and Vedder (2007) showed mixed results for different populations. In sum, these studies paint an inconclusive picture regarding the predictive value of the Cognition Hypothesis, and, by implication, its applicability to classroom instruction.

Part of the explanation may lie in the fact that most studies evaluated L2 performance by means of global CAF measures. More importantly, as Norris and Ortega (2009) pointed out, many studies treated the CAF measures as uni-dimensional constructs; that is, they used one measure of complexity, one of accuracy, and one of fluency. However, each of the three CAF dimensions has several 'sub-constructs' that "gauge distinct qualities and dimensions" that are relevant at different stages of interlanguage development (Norris & Ortega, 2009, p. 560). For example, complexity offers different measures for lexical and structural complexity, and, in their turn, both comprise different sub-sub-constructs, e.g., lexical complexity may address the variety, sophistication, or density of vocabulary use (Bulté & Housen, 2012).

In light of these results it is not surprising that Robinson states that the traditional measures of linguistic complexity, accuracy, and fluency are too global for detecting specific task effects and should be supplemented "by specific measures of the accuracy and complexity of production" (Robinson & Gilabert, 2007, p.166).

Typically, such specific measures are ontogenetically motivated in that they reflect the growing cognitive and linguistic competence of children learning their mother tongue (L1). Granted, L1 and L2 acquisition are different in many aspects, but most especially in the fact that adult learners' L2 acquisition involves a re-mapping of conceptual and linguistic form–function pairs. Thus, by referring to Slobin's (1996) 'thinking-for-speaking' metaphor Cadierno and Robinson (2009) explain that L2 learners have to acquire not only new linguistic means but also conceptual differences between their mother tongue and the target language. Even so, in investigating effects of task complexity through the manipulation of resource-directing factors – themselves based on the idea that conceptual demands trigger the use of developmentally advanced linguistic forms – it makes sense for L2 research to use measures that are based on L1 acquisition (Robinson, 2007b; cf. Révész, 2011). For example, more complex reasoning tasks are expected to induce the use of more complex linguistic means that mark the underlying concepts (e.g., a narrative task might elicit simple declarative statements such as 'In this picture I see X and Y' while an argumentative task might elicit more complex statements with conjoined clauses linked by causal conjunctions such as 'I would choose X BECAUSE it is better than Y').

Only a few published studies have evaluated the Cognition Hypothesis using task-specific measures. Robinson (2007b) manipulated the amount of intentional reasoning in simple, medium, and complex dialogic storytelling tasks. In addition to global CAF measures, he examined the use of psychological state terms (e.g., 'think', 'expect', 'know', asking for complex predication), and the use of complex syntactic structures (e.g., conjoined and infinitival phrases and wh-clauses). At the same time, the study also investigated the amount of interaction (e.g., uptake, clarification

requests) because the Cognition Hypothesis claims that more complex tasks "will result in greater amounts of interaction, and negotiation for meaning" (Robinson & Gilabert, 2007, p. 167) with all the beneficial effects on L2 learning proposed by Long (1989). While global CAF measures did not discriminate between task manipulations, task-specific measures lent support to the Cognition Hypothesis: Participants in the more complex tasks interacted more, used more psychological state terms and more conjoined phrases (marked, for example, by 'and', 'so').

Cadierno and Robinson (2009) and Robinson, Cadierno, and Shirai (2009) report on the use of motion verbs, non-prototypical uses of past tense, and progressive morphology in cognitively complex there-and-then tasks. Results of these studies confirm that increased cognitive task complexity indeed affected L2 behavior on task-specific measures but had no effect on global CAF measures. Révész (2011) evaluated L2 learners' task performance on simple versus complex reasoning tasks. Results on global measures showed partial support for the Cognition Hypothesis inasmuch as lexical complexity and accuracy increased in complex tasks whereas syntactic complexity decreased. Data on specific measures, which were based on developmental stages in child acquisition (Diessel, 2004), corroborate Robinson's claims. The complex task yielded a higher amount of developmentally advanced conjoined clause types (i.e., more biclausal coordinated sentences and adverbial clauses than independent coordinated clauses) and generated more language-related episodes, e.g., negotiations of form and meaning.

To sum up, the use of measures based on L1 developmental sequences may be critical for researching L2 production. Even so, the research reviewed above shows that this may be a way to detect and understand subtle differences in task performance

that are not captured through global CAF measures. In an earlier study investigating L2 learners' and L1 speakers' oral task-based performances in monologic and dialogic conditions by means of global CAF measures (Michel, 2011), I was unable to find any differences between simple and complex tasks manipulated on the factor ± few elements. The present article deepens the inquiry by returning to the same data set, but now examines it using a task-specific measure. The goal is to evaluate the claims of the Cognition Hypothesis with respect to resource-directing factors of task complexity as well as with respect to the value of task-specific measures.

<B>The Use of Conjunctions as a Task-Specific Measure

The choice of a task-specific measure by definition is mediated by its relevance for the task itself. It should be a structure that characterizes successful task performance and is closely related to the manipulated task design variable (Robinson & Gilabert, 2007). The present study explores performance on argumentative tasks manipulated on the resource-directing factor ± few elements; that is, participants performed on simple tasks with a few elements versus complex tasks with many elements. The task required participants to make a choice for one option out of four possibilities in the simple and one out of nine different options in the complex version respectively. During task performance participants were asked to provide reasons for their choice and to argue against the other possibilities.

It was hypothesized that the more complex task triggers more instances of argumentation than the simple task. That is, I argue that a task with many options (rather than a few) induces more argumentation because more elements need to be evaluated against each other. Furthermore, I hypothesized that task performance would show the overt use of lexical items that mark argumentative speech, such as

opinion phrases ‘I think’, ‘as I see it’; verbs in subjunctive mood ‘I would’, ‘if I were you’; and other morphosyntactic, semantic, pragmatic or phonological possibilities (cf. Vedder, 1998). The present investigation focuses on the use of conjunctions and assumes that, while conjunctions should occur in both simple and complex argumentative tasks, the latter would yield a greater quantity and greater variety of uses.

There is extensive earlier work that associates argumentation with overt clause marking by means of conjunctions, e.g., within systemic-functional approaches to both child L1 and adult L2 acquisition (e.g., Byrnes, Maxim & Norris 2010, Christie & Derewianka, 2008; Schleppegrell, 2004). Given the scope of the present study, I will limit myself in the following review to research taking a cognitive perspective on task-based oral L2 performance and to work that focuses on Dutch as a target language. Within the task-based framework, Newton and Kennedy (1996) examined L2 interactions in their own small corpus of learner data and performed follow-up experiments with L2 learners. Both investigations revealed that argumentation “requires conjunctions to mark the relationships between propositions” (p. 320). Specifically, they found that split-information tasks yielded mainly descriptive language that relied on the use of ‘and’ or no conjunctive marking at all. By contrast, tasks with shared information led to richer discussion of an issue, generated more balanced reasoning, and induced a greater use of conjunctive marking, with for example ‘so’ and ‘if’. Similarly, the studies by Robinson (2007b) and Révész (2011) found that more complex tasks promoted the use of more advanced clause types marked by conjunctions. It is worth noting that Révész based her choice of conjunctions on research by Diessel (2004) on L1 acquisition, according to which children first mark clauses by the coordinative ‘and’ before they start using more

advanced clause types marked by causal and conditional conjunctions like ‘because’, ‘so’, and ‘if’.

In a Dutch context, Evers-Vermeul (2005) took a closer look at the L1 acquisition of conjunctions from a discourse processing perspective. She states that ‘en / [and]’ and ‘want / [because]’ are acquired earlier than ‘maar / [but]’, ‘wanneer / [when]’, or ‘als / [if]’ because the latter mark more complex coherence relations. Also Spooren and Sanders (2008) argue that the growing use of conjunctions can be seen as a window into the child’s ability to build more and more complex argumentative structures. Finally, the studies by Perrez (2004) and Plomp (1997) into oral production and written comprehension by adult L2 learners of Dutch reveal that the acquisition and frequency of conjunctions resemble child developmental patterns and use.

To sum up, even though adult L2 learners are already able to balance reasons and give arguments for and against different options, they need to acquire the linguistic means to express this in the target language (Slobin, 1996). The work reviewed so far suggests that the overt use of conjunctions can be expected due to the nature of the task, i.e., giving arguments and balancing reasons. Most prominently causal conjunctions like ‘because’, ‘therefore’, and conditional phrases introduced by ‘if…then’, were expected to be used frequently by participants. Therefore, the present article explores the use of these lexical markers in the task-based performance of L2 learners of Dutch on simple and complex argumentative tasks manipulated on the number of elements.

<B>The Use of Conjunctions by Native Speakers

Surprisingly few studies within task-based L2 research have investigated native speakers' performance even though a cognitive approach to processing inherently links L1 and L2 processing on cognitive grounds, not least because "the interpretation of learner speech in light of a native speaker baseline gives valuable insights into the different processes speakers are involved in when they perform oral tasks" (Michel, 2011, p. 170). To the best of my knowledge, where such research into Dutch native speakers' use of conjunctions did occur it used a discourse processing framework that focused on the coherence relations underlying conjunctions (e.g., Evers-Vermeul, 2005; Spooren, 1997; Spooren & Sanders; 2008, Stukker, 2005). Evers-Vermeul (2005, p. 190-191), for example, explains that the "relative conceptual complexity [of a conjunction] can be thought of in terms of processing cost: the production of a relatively complex coherence relation involves a higher 'processing cost' than the production of a relatively easy coherence relation." Accordingly, she states that the processing of complex relations leaves fewer resources for the production of the linguistic element that marks this relation. Furthermore, she concludes that in children (but also in adult second language learners, who are cognitively able to understand the different coherence relations) the use of conjunctions marking more complex relations (e.g., causals 'therefore' or negative causals 'although') are acquired and used later than conjunctions marking simple additive relations (e.g., 'and') because of the higher 'processing cost' (Spooren, 1997). These claims receive further support from the corpus of spoken Dutch (Corpus Gesproken Nederlands, CGN, see Oostdijk, 2002) as the frequency of adult usage of the conjunctions largely mirrors these categorizations.[1] Because these frequencies reflect the developmental stages in child acquisition, they lend additional support for

the reliance on child acquisitional data as a basis for investigating effects of task complexity in L2 learner data.

<B>Monologic versus Dialogic Task Performance

Earlier work investigating the effects of the Cognition Hypothesis on interaction has evaluated the amount and type of interaction in simple versus complex interactive tasks (e.g., Gilabert, Baron & Llanes, 2009; Nuevo, 2006; Robinson, 2001) and found mixed results. For example, in Gilabert, Baron and Llanes (2009) increased task complexity led to more interaction in narrative but not in argumentative tasks. Michel, Kuiken, and Vedder (2007) and Michel (2011) are the only studies that systematically investigated monologic versus dialogic performance on simple versus complex tasks using global CAF measures. Findings of both studies challenge the Cognition Hypothesis, in particular regarding its claims about accuracy inasmuch as the promoting effect of increased task complexity in monologic tasks on accuracy and lexical complexity disappeared in the dialogic condition (Michel et al, 2007). Michel (2011) could not attest any combined effects of task complexity and interaction in the L2 data. However, data from both investigations showed that L2 learners were more accurate and more fluent when they worked in pairs, while syntactic complexity was higher in the individual performances. Lexical diversity, measured by means of Guiraud's Index (i.e., number of types / $\sqrt{}$ number of tokens), was only affected in Michel (2011), in that the dialogic tasks showed a higher score.

These findings are in line with Robinson's (2001) explanations that, in complex interactive tasks, frequent turn-taking may mitigate against attempts to build complex syntactic structures. In addition, the data support a claim by Tavakoli & Foster (2008) that interactive tasks may be cognitively less demanding than individual

tasks because dialogues create planning time during the interlocutor's speech. Their statement receives support from psycholinguistic studies (e.g., Pickering & Garrod, 2004) that claim that speech production in dialogues is simplified by processes of alignment and priming.[2]

<A>THE STUDY

The present study explores the use of conjunctions in oral argumentative L2 tasks in order to examine effects of increased cognitive task complexity manipulated along the factor ± few-elements and to consider the implications of its findings for the status of the Cognition Hypothesis.

<B>*Research Questions and Hypotheses*

This study addresses the following research questions and hypotheses:

<C>*Research question 1.* What is the effect of increased cognitive task complexity on the use of conjunctions in L2 oral argumentative tasks?

<C>*Hypothesis 1.* Cognitively complex tasks are expected to increase the use of conjunctions in L2 oral task performance in argumentative tasks dealing with more elements following the Cognition Hypothesis, which predicts that increased cognitive task complexity will draw the L2 learner's attention towards task-relevant linguistic structures.

A related second research question addresses L1 speaker performance:

<C>*Research question 2.* What is the difference in the use of conjunctions between L2 and L1 oral task performances in cognitively simple versus complex oral argumentative tasks?

<C>*Hypothesis 2.* As native speakers' language production relies on mainly automatic cognitive processes (Levelt, 1989), their oral performances are not expected to suffer from resource limitations due to increased cognitive task complexity in argumentative tasks. L1 speakers accordingly may not show differences in the use of conjunctions in simple versus complex task performances.

<B>*Method*

For the present work speech performances of L2 learners' and L1 speakers were coded and analyzed for the use of conjunctions. The speech samples had been collected for an earlier investigation of task-based performances by means of a 2x2 design where cognitive task complexity (simple versus complex) was the within-participant factor and interaction (monologic versus dialogic) was a between-participants factor (Michel, 2011).

<C>*Tasks.* Based on the Triadic Componential Framework (Robinson, 2005), cognitive task complexity was manipulated on the resource-directing factor ± few-elements. Two different sets of argumentative tasks (simple and complex) were designed addressing different topics (dating and study). The tasks asked participants to decide which two out of four (simple) or six (complex) people would make the best couple for the purposes of dating or study, respectively. These people differed in characteristics such as age, favorite music, and hobby. Irrespective of the topic, the

simple condition allowed for four and the complex condition for nine combinations, respectively.

<*C*>*Participants.* Sixty-four learners of Dutch as a second language participated in the study (29 males, 35 females; mean age 27.6 years, SD 6.2; mean stay in Netherlands 3.8 years, SD 4.2). They were at an intermediate level of Dutch as assessed by a written fill-in-the-gap proficiency test that asked participants to choose among three possible words (mean score out of 100: 53.8, SD 17.2).[3]

Forty-four native speakers of Dutch were included as a control group (9 males, 35 females; mean age 20.6 years, SD 3.5). They scored at ceiling on the proficiency test (mean score out of 100: 96.3, SD 3.2). All participants were attending or had finished a university (of applied sciences).

<*C*>*Procedure.* All participants completed a simple and a complex version of the experimental tasks. The order of cognitive task complexity (simple versus complex) and task topic (dating versus study) was counterbalanced over participants. Half of the participants completed both tasks on their own (monologic); the other half worked in pairs (dialogic).[4] The tasks asked participants to call a friend and explain their choice for the best dating or study couple. In the monologic setting, the friend was unable to answer the phone so they should leave a message of about three minutes on an answering machine. In the dialogic condition, participants discussed their choices with each other for about 6 minutes. All participants received two minutes of planning time. In order to ensure that they use all the speaking time available and that they would consider all possible combinations in their argumentation, they were encouraged not only to explain why a pair of people was best but also why others would not make a good couple.

In between the two experimental tasks, participants performed the Dutch proficiency test. For the proficiency test, L2 learners had 30 minutes time, L1 speakers only 15 minutes. In order to control for time on task natives performed for another 15 minutes on a C-test in Dutch, which had a dummy function only and, therefore, data from this test were not analyzed.

<*C*>*Data Treatment and Analysis.* The speech samples of all 108 participants were transcribed and analyzed for the task-specific measure of the use of conjunctions using CLAN (MacWhinney, 2000).

<*C*>*Conjunctions under Investigation.* Ten percent of the transcripts (six simple monologic L2, six complex monologic L2, six simple dialogic L2, etc.) were screened for the use of conjunctions. The ten most prominently-used conjunctions (e.g., 'en'/'and', 'maar'/'but') were combined with the conjunctions named in a list of lexical markers of argumentation in Dutch (Vedder, 1998). This resulted in a set of thirty conjunctions that were likely to be present in the speech performances (see Table 1).[6]

<TABLE 1 ABOUT HERE>

In a first step, these thirty conjunctions were compared to the transcripts of the speech performances using CLAN (MacWhinney, 2000).[7] This revealed that eight conjunctions from the set were not used at all. Two other conjunctions, 'waarom' and 'wanneer' (English 'why' and 'when'), were removed from the counts because they are easily confused with the homophonic markers for wh-questions (the third column

in Table 1 lists the excluded conjunctions.). Data from the resulting twenty conjunctions were analyzed separately for the L2 and the L1 data using SPSS 16.1.

<C>*Occurrence and Frequency of Conjunctions.* Frequency and occurrence of conjunctions in all speech samples were operationalized in the following fashion:

Frequency is the number of conjunctions per 100 words in a task performance (≈ tokens).[5]

Occurrence is the number of participants that use a conjunction at least once in a task performance (≈ types).

The frequency ratio gives an impression of how often participants make use of conjunctions in their speech acts overall. However, the frequency measure does not provide information on whether participants use a different set of conjunctions in the two tasks. Because cognitively complex argumentative tasks might call for more elaborated performance, including a larger repertoire of different conjunctions, an additional measure that captures this likelihood was introduced. According to Révész (2011), a higher occurrence score indicates that more participants used a conjunction at least once, thereby indicating a larger repertoire of conjunction use on the part of the participants.

The properties (normality, homogeneity of variance, and sphericity) of the frequency and occurrence data of all conjunctions allowed a multivariate analysis of variance (MANOVA) with task complexity (± few-elements) as a within-participant factor and interaction (± monologic) as a between-participants factor. The alpha level was set to $p < .05$ and effect sizes (η_p^2) equal to or greater than .01, .06, and .14 were seen as small, moderate, and large respectively (Sink & Stroh, 2006).

<*C*>*Highly Task-Relevant Conjunctions.* In a second step, the analysis focused on five conjunctions that were expected to be particularly task relevant. As the tasks at hand required participants to balance reasons when arguing for or against a possible dating or study couple, the L2 learner's attention may be strongly drawn towards conjunctions marking causal and conditional relations. Examples (1) to (3) give excerpts of two native speakers of Dutch interacting on the simple dialogic study task:[8]

(1) A: eh misschien is het leuk, om eh X en Y aan mekaar te koppelen want eh Y komt uit eh Frankrijk.
(maybe it is nice to combine X and Y because uh Y is from uh France.)
B: ja
(yes)
A: en eh X, die eh studeert Frans, dus X zou daar wel een hele hoop van kunnen leren, eh denk ik zo.
(and uh X, she studies French, so X could learn a lot from it, uh I think.)

(2) B: ja maar ja en Z, die eh ja nee ik zou toch voor X gaan, eh denk ik.
(yes but yes and Z, she uh yes no, even so I would chose X, uh I guess)
A: als ik ook eens naar zo een eh naar ze kijk, dan zullen die wel goed met elkaar overweg kunnen, denk ik eh.
(if I also take a uh I take a look, then, I think uh, they will be a good match)

(3) A: die X en Y, die gaan natuurlijk Frans met elkaar praten dan en dat is niet toch niet helemaal de bedoeling van eh.

(X and Y, they will speak French with each other and that is not, not really the idea of uh)

B: nee want het is natuurlijk de bedoeling dat ze Nederlands leren

(no, because the idea is that they will learn Dutch.)

Based on these excerpts, the four causal conjunctions ‘want’ and ‘omdat’ (both meaning ‘because’ in English) and ‘daarom’ and ‘daardoor’ (both may translate into English as ‘therefore’) and the conditional conjunction ‘als . . . dan’ (English ‘if. . .then’) were evaluated in more detail because they seemed to be particularly natural and relevant (if not essential, cf., Loschky & Bley-Vroman, 1993) for the tasks at hand. In the remainder of this article, these five conjunctions will be referred to as ‘highly task-relevant conjunctions’ (see the second column in Table 1).

As the data on the highly task-relevant conjunctions were not normally distributed, they were subject to Wilcoxon Signed Ranks tests for the repeated measures of cognitive task complexity. Separate calculations were made for L2 and L1 monologues and dialogues. The alpha level was set to $p < .05$ and effect sizes (r) of .10 (small), .30 (moderate), and .50 (large) were acknowledged (Field, 2005).

<A>RESULTS

The following tables and figures present the study findings.

<TABLES 2 AND 3 ABOUT HERE>

The results for the L2 learners with respect to the frequency and occurrence of conjunctions are presented in Table 2 and 3, respectively. They list absolute counts as well as the numbers (and percentages) of participants per conjunction in simple and

complex monologues and dialogues for the ten most frequently used conjunctions. Furthermore, they give totals for ten rarely used conjunctions and for all twenty conjunctions. Table 4 and 5 provide the corresponding figures of the native speaker data.

<TABLES 4 AND 5 ABOUT HERE>

Although these raw scores are biased for sample length the following observations are possible: In general, complex tasks yield higher numbers than simple tasks. For L2 learners, especially, complex dialogues increase the number of conjunctions. Non-natives prefer a set of ten conjunctions with ‘en’/‘and’, ‘maar’/‘but’, ‘dus’/‘so’, ‘als . . . dan’/‘if . . . then’, and ‘of’/‘or’ at the top, which they use very frequently. Native speakers prefer the same ten conjunctions, but the distribution is different. For example, natives use ‘als . . . dan’/‘if . . . then’ at similar rates as ‘maar’/‘but’ and display a high usage of ‘om . . . te’/‘in order to’ but not ‘of’/‘or’. In native dialogues ‘maar’/‘but’ seems to be more prominently used.

A comparison of occurrence measures (Tables 3 and 5) shows that indeed all natives used ‘als . . . dan’/‘if … then’ and ‘om . . . te’/‘in order to’ (at least in monologues) while L2 learners show much less frequent use. Not surprisingly, the L1 speakers use a greater range of conjunctions. Contrary to expectations, ‘daardoor’ (‘therefore’) – one of the five conjunctions that was assumed to be highly task-relevant – is not among the most frequent conjunctions in either population.

<B>The Use of Conjunctions

Table 6 summarizes the means over all 20 conjunctions corrected for sample length for both populations.[9] While L2 learners show a higher frequency, L1 speakers display a higher occurrence. With the exception of the frequency in monologues, increased cognitive task complexity in L2 speakers resulted in higher scores. For L1 speakers, complex tasks yielded higher scores in monologues but lower scores in dialogues.

<TABLE 6 and 7 ABOUT HERE >

However, as summarized by Table 7, the results of the MANOVA performed on these data did not yield any significant multivariate effects in either population, although L1 speakers show a moderate trend effect for interaction ($F(2,41) = 2.966$; $p = .063$; $\eta_p^2 = .126$).

Broken down into univariate effects, the L2 frequency shows a trend for the combination of task complexity and interaction ($F(1,62) = 3.807$; $MSQ = 14.749$; $p = .056$; $\eta_p^2 = .058$) but it was neither affected significantly by cognitive task complexity on its own, nor in combination with interaction. L1 speakers, however, show a moderate but significant main effect for interaction on the frequency measure. That is, irrespective of task complexity, L1 speakers have a lower frequency of conjunctions in dialogues than in monologues ($F(42,1) = 5.517$; $MSQ = 27.707$; $p < .05$; $\eta_p^2 = .116$).

<B>Focusing on Highly Task-Relevant Conjunctions

The second analysis focused on the five conjunctions that specifically mark causal and conditional reasoning: ‘want’/‘omdat’ (‘because’), ‘daarom’/‘daardoor’ (‘therefore’), and ‘als . . . dan’ (‘if . . . then’). The descriptive statistics are given in

Tables 8 (L2 learners) and 9 (L1 speakers), while statistically significant inferential data are mentioned in the text. For L2 learners the absolute numbers do not show an obvious pattern. The results of a Wilcoxon Signed Ranks test revealed one significant effect of a moderate size on the occurrence of 'omdat'/'because', that is higher in simple than in complex monologues ($T = 2$, $z = -2.111$, $p < .05$, $r = -0.264$).

< TABLE 8 and 9 ABOUT HERE>

For L1 speakers the frequency measures of all highly relevant conjunctions are lower in complex than in simple tasks. The statistical analyses, however, show one moderate but significant result for the frequency of 'daarom'/'therefore' in dialogues only. Again, it decreases from simple to complex tasks ($T = 1$, $z = -2.028$, $p < .05$, $r = -0.293$). All other comparisons of L2 and L1 data regarding the frequency or occurrence of the highly relevant conjunctions did not reveal significant results.

<A>DISCUSSION

Robinson and colleagues argue that specific measures could be used as a complement to global CAF measures in order to reveal differences due to increased cognitive task complexity (Cadierno & Robinson, 2009; Robinson et al., 2009; Robinson & Gilabert, 2007). The present study has followed this suggestion and investigated the use of conjunctions in monologic and dialogic L2 performances on simple and complex argumentative tasks manipulated along the resource-directing factor ± few-elements. Because the data are interpreted in light of an L1 speaker baseline the difference between native and non-native speakers' use of conjunctions is also evaluated. Furthermore, differential effects on monologic versus dialogic task

performances are discussed by highlighting interactions between conditions and populations.

<B>The Use of Conjunctions in Cognitively Simple versus Complex Tasks

Concerning the main research question, the results of the MANOVA on the frequency and occurrence of a large set of different conjunctions showed no significant main effect of cognitive task complexity, nor was the combination of cognitive task complexity by interaction significant. The analysis on five highly task-relevant conjunctions revealed that 'omdat'/'because' was affected significantly by increased cognitive task complexity. This effect was found on the occurrence measure only and was in opposition to the hypothesized direction: Complex tasks yielded a lower score than simple tasks. Neither the occurrence of the other conjunctions nor the frequency of any particular conjunction was significantly influenced by cognitive task complexity. In other words, research hypothesis 1 on the use of (highly task-relevant) conjunctions in L2 oral argumentative tasks was not supported.

Concerning the second question, whether native and non-native speakers performed similarly in the present study, some interesting contrasts arise. In relation to the first research question, both populations are similarly influenced by cognitive task complexity. With the exception of lower scores for one highly task-relevant conjunction ('omdat'/'because' in L2 learners and 'daarom'/'therefore' in L1 speakers), increased cognitive task complexity did not affect the use of conjunctions in either population. Consequently, although the raw data point towards an increase in the number of conjunctions from cognitively simple to complex tasks, a statistical analysis that is adjusted for sample length does not yield confirming results. The overarching conclusion, accordingly, is that a cognitively more demanding task as

manipulated in the present study on the resource-directing factor ± few-elements does not focus the L2 learner's attention towards conjunctions such that the frequency or occurrence of these conjunctions is substantially affected.

The results thus challenge the claims of the Cognition Hypothesis about the effects of cognitive task complexity on the use of task-specific measures (Cadierno & Robinson, 2009; Robinson et al., 2009; Robinson & Gilabert, 2007). Because the only significant effect of higher cognitive task complexity was a decrease in performance (on the occurrence of the highly task-relevant conjunction 'omdat'/'because' in L2 monologues), one could attribute the findings to Skehan's Trade-off Hypothesis (Skehan, 2009). Yet, the data do not confirm Skehan's approach either. Only one out of five highly task-relevant conjunctions was significantly affected in a manner that would be predicted by Skehan and none of the comparisons in the overall analysis were significant. Such results demand further exploration of other possible explanations for the data.

<B>The Factor ± Few-Elements

The present analysis extends my previous examination of the same corpus of data, which had used global CAF measures (Michel, 2011). That analysis had found that lexical diversity was higher in cognitively complex tasks while accuracy and fluency were unaffected, thereby challenging the predictive value of Robinson's Cognition Hypothesis: other than resulting in different language use, the increase in complexity, as operationalized in terms of the number of elements in the task input, resulted in the same linguistic behavior of L2 learners, from a qualitative standpoint, though an increase in use (quantitative change) did occur.

Similar findings obtain for the present study using a task-specific measure: the absolute scores show that the complex tasks generated a higher number of conjunctions than the simple tasks (Tables 2 and 3); but when speech samples are corrected for sample length this finding is non-significant (see Tables 7 and 9). The fact that occurrence (which is not dependent on speech length) is not affected by the complexity of the task gives greater credence to this explanation.

This raises the question of why Kuiken and Vedder (2007) and Révész (2011), who also investigated the factor ± few-elements, support the Cognition Hypothesis. These studies manipulated the number of elements such that it explicitly involved an increase of the factor ± reasoning-demands. Kuiken and Vedder (2007) suggest that an increase in the number of elements almost automatically implies a higher amount of reasoning: As more items need to be argumentatively differentiated, more reasoning emerges in complex than in simple tasks, resulting in an increase in cognitive complexity. For example, in Kuiken and Vedder (2007), participants had to take into account more characteristics of the same number of elements when reasoning about a decision. Révész (2011) manipulated the number of elements as well as the factor ± reasoning-demands and found supportive results.

It may be that in these earlier studies, the combined manipulations of the factors ± few-elements and ± reasoning-demands have the potential to affect cognitive processes during task-based L2 performance and qualitatively influence L2 performance. In contrast, the present study operationalized the factor ± few-elements without an explicit link to the reasoning demands of the task. In the simple task, participants were asked to find the best pair out of four people each characterized by six properties. In the complex task two people with six properties each were added.

Even though, this time, there were nine possibilities to combine people into pairs, this likely did not entail an 'automatic' increase in cognitive task complexity – a judgment that is reflected in the data. The fact that L1 speakers and L2 learners showed similar language use corroborates this explanation. For native speakers, no effects were expected because their language production is highly automatic and it was not expected that their speech production would suffer due to higher cognitive task demands.

A limitation of the present study is that no external means were used to evaluate the assumed increases in cognitive task complexity. That is, there is no proof that the higher number of elements in the complex tasks resulted in higher cognitive demands. Future work might therefore seek independent external evidence that manipulation of a task indeed results in higher cognitive task complexity. As it stand, the study shows L2 production to be influenced quantitatively, that is, tasks with more elements led to more speech, which affected Guiraud's Index in Michel (2011) and is visible on an increased frequency of conjunctions in the present study. The task manipulation, however, did not result in a qualitative difference, be it a wider range of different conjunctions when using a task-specific measure or concerning syntactic complexity, accuracy, or fluency when using global measures.

The present data suggest that, in the earlier studies by Révész (2011) and Kuiken & Vedder (2007), it was the factor ± reasoning-demands that resulted in the qualitative changes in task performance rather than the factor ± few elements. The question of whether the factor ± few-elements has the potential to affect L2 learners' attentional allocation during task-based performance, as predicted by the Cognition

Hypothesis (Robinson, 2007b), or whether increasing the number of elements has a quantitative effect only, is a topic for future investigation.

<B>*Conjunctions As a Task-Specific Measure*

Another limitation of the present study must be pointed out: it relied on one task-specific measure only. This entails that the hypotheses were tested by means of the use of conjunctions and not other aspect of task performance. The tasks at hand were argumentative tasks that were manipulated along the factor ± few-elements; that is, the simple and the complex tasks asked the speakers to provide support for their choices. Both tasks, therefore, elicited argumentative speech. As explained previously, there are many different ways to lexically mark argumentation. Examples (1) to (3) showed that, apart from conjunctions, native speakers use conjunctive verb forms ('could', 'would'), adverbs ('perhaps', 'maybe'), and opinion phrases marked by 'I think'. It may be that also these kinds of structures are closely related to task performance on the argumentative tasks and it would be interesting to evaluate a manipulation of the number of elements by means of other types of task-specific measures.

Taken from the examples in (4) and (5) of two pairs of L2 learners performing the tasks, other linguistic structures could be informative, for example, the use of relative clauses (underlined), demonstrative pronouns (italics), or adjectives (bold) and their comparative and superlative forms.

(4) A: als wij ehm twee studenten moeten kiezen, eh de dan eh moeten wij *diegene* kiezen, <u>die eh goe eh goed Nederlands spreken</u>, of en eh <u>die eh het staatexamen halen</u>.

(if we uhm have to choose two students, uh the, then uh we must choose *those*, who speak uh goo uh good Dutch, or and uh, who uh pass the final exam.)

B: volgens mij is het ook ja is het belangrijk.

(as I see it, this is important, yes)

(5) C: ja lijkt mij ook de **best** eigenlijk.

(yes, I think that is **best**)

D: maar ja het ene meisje **mooier** dan die ander.

(but yes, that girl [is] **more beautiful** than the other.)

C: maar ja *die* ene vind ik best **jong** eigenlijk en…

(but yes, *that* other one, I find her rather **young** and…)

Future work investigating effects of the factor ± few-elements in the context of argumentative tasks may focus on these linguistic means as they would avoid the risk of confounding it with the factor ± reasoning.

At this point it is important, to remember that this study limited itself to work from a cognitive perspective on task-based research (Skehan, 2003) and focused on the use of conjunctions in oral Dutch performances. It is another limitation of the present work that this narrow scope did not take into account other frameworks that explain the use of lexical markers in argumentation by language learners (cf., the socio-functional work on L2 writing by Byrnes, Maxim & Norris, 2010; Christie & Derewianka, 2008; Schleppegrell, 2004). In a follow-up study, it would be interesting to reanalyze the dataset in terms of these approaches.

In any case, within the cognitive strand to task-based research, the use of conjunctions as a specific measure did not show the expected effects of increased

cognitive task complexity, even though it provided other insights. These will be discussed in the following section.

<B>Native Versus Non-Native Task Performance

While cognitive task complexity did not affect the performance in either the native or the non-native populations, the two groups show variance, especially when comparing the monologic and dialogic task condition. Generally, L1 speakers show higher occurrences and L2 learners higher frequencies of conjunctions. This result mirrors Vedder (1998), who found that in argumentative writing L2 learners tend to overuse overt lexical markers when compared to L1 speakers. This may reflect the tendency of beginning and intermediate L2 learners to mark information lexically (e.g., by means of an overt conjunction) while L2 learners with increased proficiency rely more on phrase-internal structural means to express their intentions (Norris & Ortega, 2009; Pallotti, 2009). A more varied use of conjunctions by L1 speakers, as shown by the occurrence measure, could be a result of this strategy of proficient language users. Future work may consider taking a closer look at, for example, complex noun and verb phrases, in order to explore phrase-internal complexification.

It is worth noting that the distribution of conjunctions is different in the two populations (cf. Tables 2 to 5). While L1 speakers, use ‘als. . .dan’/‘if. . .then’ and ‘om . . . te’/‘in order to’ frequently, L2 learners do not mirror this behavior. The difference in lexical preference may be explained by the fact that these multicomponential conjunctions ask for complex syntactic structures (subordination, infinitive clauses). Possibly, L2 learners are not able to build these constructions – particularly in dialogic tasks, where the existence of an interlocutor requires a constant flow of turn-taking and delivery of speech (Fiksdal, 2000). If L2 learners do

not have the linguistic means or cognitive resources to build these kinds of structures, they presumably deliberately omit conjunctions that would require them to use complex syntax.

<FIGURE 1 ABOUT HERE >

Most interesting, however, is the differential effect of interaction in natives and non-natives (see Figure 1). It seems that an interactive task condition systematically influences L1 speakers' task-based performances but not that of L2 learners. In other words, L1 speakers use significantly fewer conjunctions in dialogues than in monologues while L2 learners show no general pattern. Michel et al. (2007) as well as Michel (2011) have demonstrated that an interactive task condition largely influences task performers' complexity, accuracy, and fluency. The analysis by means of global CAF measures showed that interactive tasks make L2 learners more accurate, more fluent, and lexically more diverse but syntactically less complex. With respect to the use of conjunctions, L2 behavior seems to be unaffected. Therefore, it may be more important to find an explanation for the lack of an effect in non-natives than for its existence in the native baseline data.

The native population shows a decrease from monologic to dialogic tasks with respect to the frequency and the occurrence of conjunctions. As the frequency measure is related to the number of words and not to the amount of syntactic units or clauses, it cannot be a consequence of turn-taking.[10] It is possible that native speakers decrease the number of conjunctions they use in a dialogue because of psycholinguistic processes of alignment (Pickering & Garrod, 2004). In Michel (2011) I found a decrease of lexical diversity in native speakers' dialogic speech. Presumably, following the idea of routinization, native interlocutors agree on a certain

set of conjunctions to use throughout the conversation, which decreases their use as a whole.

Why then do L2 learners not mirror the L1 behavior? Possibly, recycling words of their speaking partner resulted in a wider range of use of conjunctions in L2 learners. In other words, they profited form the target language knowledge of their interlocutor and were able to extend their own use of conjunctions based on the input of their speaking partner. This is another area for future work to explore.

<A>SUMMARY AND CONCLUSION

This article presents an exploration of the use of conjunctions as a specific measure of L2 production in cognitively simple versus complex on argumentative tasks manipulated along the factor ± few-elements. It elaborates on an earlier analysis of the same data by means of global CAF measures (Michel, 2011). Contrary to expectations, only minor effects of an increased number of elements could be attested. Consequently, this article demands further reconsideration of the Cognition Hypothesis. From the methodological standpoint, the present study shows once more that the interpretation of L2 learners' speech gains from the availability of L1 speakers' data confirming Pallotti's (2009) statement, that "native speakers' baseline data are crucial, not because learners' aim is necessarily to behave like native speakers, but because looking at what native speakers do may overcome the researchers' bias towards seeing learners as defective language users, who always need to 'do more'." (p. 598).

Finally, this work questions whether the factor ± few-elements, as manipulated in the present study, can affect L2 learners' attentional allocation during task-based

performance. As no external means confirmed the higher cognitive complexity of the task addressing many elements, and as L1 and L2 speakers show similar patterns, it may be impossible to draw firm conclusions. Furthermore, only one task-specific measure was used and the analysis adopted a narrow scope of research, that is, the cognitive perspective on oral task-based production. It is possible that other measures and approaches would reveal the effects predicted by Robinson's (2007b) Cognition Hypothesis.

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NOTES

1. For example, the frequency in the CGN of Dutch 'en' ('and') is larger than 200,000, of 'want' ('because') about 30,000, and of 'hoewel' ('although') only 550.

2. Pickering & Garrod (2004) note the tendency of interlocutors to reuse linguistic items and structures that occurred in previous utterances. For example, they copy the speech of their speaking partner at all levels of linguistics (e.g., morpho-syntax,

semantics). Alignment is linked to the psychological process of priming, i.e., the easier activation and recognition of an earlier mentioned linguistic unit.

3. I thank the Language Center of the University of Groningen, which uses this task as a placement test for their language courses.

4. In dialogues, interlocutors shared their mother tongue and gender.

5. As subordinate conjunctions introduce subordinate clauses, the number of conjunctions was related to the number of words rather than to the number of syntactical units.

6. For example, temporal conjunctions were excluded because the tasks did not ask for time reference.

7. 'Als. . .dan' and 'om. . .te' were counted if either of the two parts was present.

8. Conjunctions in italics.

9. Average sample sizes of a single speakers performance in Analysis of Speech (AS)-units (Foster, Tonkyn, & Wigglesworth, 2000) were for L2 learners: *monologue simple* = 31, *complex* = 37; *dialogue simple* = 47, *complex* = 60; and for L1 speakers: *monologue simple* = 30, *complex* = 33; *dialogue simple* = 41, *complex* = 46.

10. This would increase the number of syntactic units, e.g., (T-, C-, AS-unit), which in turn would automatically decrease the frequency as an artifact of the calculations.

REFERENCES

Bulté, B., & Housen, A. (2012). Defining and operationalising L2 complexity. In A. Housen, F. Kuiken, & I. Vedder (Eds.), *Dimensions of L2 Performance and Proficiency: Complexity, Accuracy and Fluency in SLA* (pp. 21-46). Amsterdam/Philadelphia: John Benjamins .

Byrnes, H., Maxim, H.H., & Norris, J.M. (2010) Realizing advanced L2 writing development in a collegiate curriculum: Curricular design, pedagogy, assessment. *Modern Language Journal*, supplement to vol. 94, monograph.

Cadierno, T., & Robinson, P. (2009). Language typology, task complexity and the acquisition of L2 lexicalization patterns for reference to motion. *Annual Review of Cognitive Linguistics, 7,* 245–276.

Christie, F. & Derewianka, B. (2008). *School discourse. Learning to write across the years of schooling*. London: Continuum.

Diessel, H. (2004). *The acquisition of complex sentences*. New York/Cambridge: Cambridge University Press.

Ellis, R. (2000). Task-based research and language pedagogy. *Language Teaching Research*, 4(3), 193–220.

Evers-Vermeul, J. (2005). *The development of Dutch connectives: Change and acquisition as windows on form-function relations*. Utrecht, the Netherlands: LOT-Dissertation Series.

Field, A. (2005). *Discovering statistics using SPSS*. Thousand Oaks, CA/London: Sage.

Fiksdal, S. (2000). Fluency as a function of time and rapport. In H. Riggenbach (Ed.), *Perspectives on Fluency* (pp. 128–140). Ann Arbor, MI: University of Michigan Press.

Foster, P., Tonkyn, A., & Wigglesworth, G. (2000). Measuring spoken language: A unit for all reasons. *Applied Linguistics, 21,* 354–375.

Gilabert, R. (2007). Effects of manipulating task complexity on self-repairs during L2 oral production. *International Review of Applied Linguistics* 45, 215–240.

Gilabert, R., Baron, J. & Llanes, A. (2009). Manipulating cognitive complexity across task types and its impact on learners' interaction during oral performance. *International Review of Applied Linguistics,* 47, 367–395.

Givón, T. (1985). Function, structure, and language acquisition. In D. I. Slobin (Ed.), *The Crosslinguistic Study of Language Acquisition* (pp. 1008–1025). Hillsdale, NJ: Erlbaum.

Ishikawa, T. (2007). The effect of manipulating task complexity along the ± here-and-now-dimension on L2 written narrative discourse. In M. d. P. Garcia Mayo (Ed.), *Investigating Tasks in Formal Language Learning* (pp. 136–156). Clevedon, UK: Multilingual Matters.

Kuiken, F., & Vedder, I. (2007). Task complexity and measures of linguistic performance in L2 writing. *International Review of Applied Linguistics, 45,* 261–284.

Levelt, W. J. (1989). *Speaking: From intention to articulation*. Boston: MIT Press.

Long, M. H. (1985). A role for instruction in second language acquisition: Task-based language teaching. In K. Hyltenstam & M. Pienemann (Eds.), *Modeling and Assessing Second Language Acquisition* (pp. 77–99). Clevedon: Multilingual Matters.

Long, M. H. (1989). Task, group, and task-group interaction. *University of Hawai'i Working Papers in English as a Second Language,* 8(2), 1–26.

Long, M. H., & Robinson, P. (1998). Focus on form: Theory, research, and practice. In C. J. Doughty & J. Williams (Eds.), *Focus on Form in Second Language Acquisition* (pp. 15–41). Cambridge: Cambridge University Press.

Loschky, L. & Bley-Vroman, R. (1993). Grammar and task-based methodology. In S.M.Gass & G.Crookes (Eds.) *Tasks and Language Learning: Integrating Theory and Practice*. (pp.123-167). Clevedon, UK: Multilingual Matters.

MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk*. Mahwah, NJ: Lawrence Erlbaum.

Michel, M. C. (2011) Effects of task complexity and interaction on L2 performance. In P. Robinson (Ed.) *Second Language Task Complexity: Researching the Cognition Hypothesis of Language Learning and Performance* (pp. 141–173). Philadelphia/Amsterdam: John Benjamins.

Michel, M. C., Kuiken, F., & Vedder, I. (2007). The influence of complexity in monologic versus dialogic tasks in Dutch L2. *International Review of Applied Linguistics, 45,* 241–259.

Newton, J., & Kennedy, G. (1996). Effects of communication tasks on the grammatical relations marked by second language learners. *System, 24,* 309–322.

Norris, J., & Ortega, L. (2009). Measurement for understanding: An organic approach to investigating complexity, accuracy, and fluency in SLA. *Applied Linguistics, 30,* 555–578.

Nuevo, A.-M. (2006). *Task complexity and interaction*. Unpublished Ph.D. Thesis, Georgetown University, Washington D.C., USA

Oostdijk, N. (2002) The design of the Spoken Dutch Corpus. In P. Peters, P. Collins, & A. Smith (Eds.), *New Frontiers of Corpus Research* (pp. 105–114). New York/Amsterdam: Rodopi.

Pallotti, G. (2009). CAF: Defining, refining and differentiating constructs. *Applied Linguistics, 30,* 590–601.

Perrez, J. (2004). Het gebruik van connectieven door franstalige leerders van het Nederlands: Een eerste verkenning.[The use of connectives by French learners of Dutch: A first inquiry.] *Toegepaste Taalwetenschap in Artikelen [Dutch Journal of Applied Linguistics]*, *71,* 81–92.

Pickering, M. J. & S. Garrod (2004). Toward a mechanistic psychology of dialogue. *Behavioral and Brain Sciences, 27,* 169–226.

Plomp, F. (1997). Een empirisch onderzoek naar het effect van lexicale structuur-markeringen op teskstbegrip in de eerste en in de tweede taal.[An empirical research into the effect of lexical structure-marking on the understanding of

texts in the first and the second language.] *Toegepaste Taalwetenschap in Artikelen [Dutch Journal of Applied Linguistics], 56,* 47–61.

Révész, A. (2009). Task complexity, focus on form, and second language development. *Studies in Second Language Acquisition, 31,* 437–470.

Révész, A. (2011). Task complexity, focus on L2 constructions, and individual differences: A classroom-based study. *Modern Language Journal, 95,* 162–181.

Robinson, P. (2001). Task complexity, task difficulty and task production: Exploring interactions in a componential framework. *Applied Linguistics, 22,* 27–57.

Robinson, P. (2005). Cognitive complexity and task sequencing: Studies in a componential framework for second language task design. *International Review of Applied Linguistics, 43,* 1–32.

Robinson, P. (2007a). Criteria for grading and sequencing pedagogic tasks. In M. d. P. Garcia Mayo (Ed.), *Investigating tasks in formal language learning* (pp. 7–27). Clevedon, UK: Multilingual Matters.

Robinson, P. (2007b). Task complexity, theory of mind, and intentional reasoning: Effects on L2 speech production, interaction, uptake and perceptions of task difficulty. *International Review of Applied Linguistics, 45,* 193–213.

Robinson, P., Cadierno, T., & Shirai, Y. (2009). Mind, time, and motion: Measuring the effects of the conceptual demands of tasks on second language speech production. *Applied Linguistics, 30,* 533–554.

Robinson, P., & Gilabert, R. (2007). Task complexity, the Cognition Hypothesis and second language learning and performance. *International Review of Applied Linguistics, 45*, 161–176.

Schleppegrell, M.J.. (2004). *The language of schooling: A functional linguistics perspective.* Mahwah, New Jersey: Lawrence Erlbaum.

Sink, C. H., & Stroh, H. R. (2006). Practical significance: Use of effect sizes in school counseling research. *Professional School Counseling, 9,* 401–411.

Skehan, P. (1998) *A cognitive approach to language learning*. Oxford: Oxford University Press.

Skehan, P. (2003). Task-based instruction. *Language Teaching*, *36(1),* 1–14.

Skehan, P. (2009). Modelling second language performance: Integrating complexity, accuracy, fluency, and lexis. *Applied Linguistics, 30,* 510–532.

Skehan, P., & Foster, P. (2005). Strategic and on-line planning: The influence of surprise information and task time on second language performance. In R. Ellis (Ed.), *Planning and Task Performance in a Second Language* (pp. 193–218). Philadelphia/Amsterdam: John Benjamins.

Slobin, D. 1996. From "thought and language" to "thinking for speaking". In J. Gumperz & S. Levinson (Eds.). *Rethinking Linguistic Relativity* (pp. 70–96). Cambridge: Cambridge University Press.

Spooren, W. (1997). The processing of underspecified coherence relations. *Discourse Processes, 24,* 149–168.

Spooren, W., & Sanders, T. (2008). The acquisition order of coherence relations: On cognitive complexity in discourse. *Journal of Pragmatics, 40,* 2003–2026.

Stukker, N. (2005) *Causality marking across levels of language structure: A cognitive semantic analysis of causal verbs and causal connectives in Dutch*. Utrecht, The Netherlands: LOT-Dissertation Series.

Tavakoli, P., & Foster, P. (2008). Task design and L2 performance. *Language Learning, 58,* 429– 473.

Vedder, I. (1998). *Dunque l'Italia ha perso il suo fascino? Io penso di no: Argumenterend schrijven in een tweede taal. Een analyse van argumentatieve teksten van Nederlandse studenten Italiaans.* [So, Italy has lost its attractiveness? I don't think so. Argumentative writing in a second language. An analysis of argumentative texts of Dutch learners of Italian]. LOT-Dissertation Series. Den Haag, The Netherlands: Holland Academic Graphics.

Wickens, C. D. (2007). Attention to the second language. *International Review of Applied Linguistics, 45,* 177–191.

TABLE 1

All Dutch Conjunctions Used For Comparing Speech Performances On The Simple And Complex Tasks

Present at least once	Highly task relevant	Not present or removed
*aangezien/*as,	*(als)…dan/*(if). . .then,	*desalniettemin*/nonetheless
*alhoewel/*although,	*daardoor*/therefore,	*echter*/however,
*bovendien/*moreover	*daarom*/therefore,	*indien*/if,
*doordat/*therefore, *dus/*so,	*omdat*/because,	*nochtans*/still,
*en/*and, *hoewel/*though,	*want*/because	*ofschoon*/although,
*maar/*but, *of/*or,		*tenzij*/if not,
*om. . .te/*in order to,		*totdat*/until,
*toen/*then,		*waarom*/why, *wanneer*/when,
*toch/*even so, *terwijl/*while,		*weliswaar*/although
*zodat/*so that, *zowel/*as well		

Note. *Dutch*/English translation.

TABLE 2

Absolute Numbers For The Frequency Of Conjunctions For L2 Learners

L2 learners	Monologue (N = 32)			Dialogue (N = 32)		
Frequency	simp	comp	tot	simp	comp	tot
als. . .dan/if. . .then	34	33	67	52	76	128
daarom/therefore	20	10	30	12	16	28
dus/so	89	115	204	80	119	199
en/and	475	489	964	443	576	1019
maar/but	94	127	221	140	195	335
of/or	39	55	94	47	74	121
omdat/because	38	29	67	20	24	44
om. . .te/in order to	36	30	66	16	26	42
toch/even so	2	5	7	12	26	38
want/because	37	45	82	38	35	73
10 low freq. conj.	4	7	11	3	11	9
tot. all 20 conj.	868	945	1813	863	1173	2036

Note. L2 = second language; N = number of participants; simp = simple; comp = complex; tot = total; 10 low freq. conj. = sum of other 10 low frequent conjunctions; tot. all 20 conj. = absolute total of all 20 conjunctions

TABLE 3

Absolute Numbers For The Occurrence Of Conjunctions For L2 Learners

L2 learners	Monologue (N = 32)			Dialogue (N = 32)		
Occurrence	simp	comp	tot	simp	comp	tot
	% (n)	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*
als. . .dan/if. . .then	59 (19)	53 (17)	81 (26)	63 (20)	72 (23)	84 (27)
daarom/therefore	28 (9)	22 (7)	38 (12)	28 (9)	22 (7)	41 (13)
dus/so	63 (20)	78 (25)	84 (27)	75 (24)	75 (24)	78 (25)
en/and	100 (32)	100 (32)	100 (32)	10 (32)	100 (32)	100 (32)
maar/but	69 (22)	94 (30)	97 (31)	91 (29)	97 (31)	100 (32)
of/or	59 (19)	56 (18)	81 (26)	59 (19)	78 (25)	84 (27)
omdat/because	59 (19)	38 (12)	66 (21)	31 (10)	38 (12)	50 (16)
om. . .te/in order to	53 (17)	50 (16)	75 (24)	31 (10)	47 (15)	59 (19)
toch/even so	6 (2)	13 (4)	19 (6)	31 (10)	31 (10)	41 (13)
want/because	44 (14)	50 (16)	56 (18)	56 (18)	47 (15)	63 (20)
10 low freq. conj.	6 (2)	13 (4)	16 (5)	9 (3)	16 (5)	25 (8)
tot. all 20 conj.	13	12	14	13	13	16

Note. L2 = second language; N = number of participants; simp = simple; comp = complex; tot = total; n = number of performances where a conjunction was used; % = percentage of performances; 10 low freq. conj. = sum of other 10 low frequent conjunctions; tot. all 20 conj. = total number of different conjunctions used in all the performances

TABLE 4

Absolute Numbers For The Frequency Of Conjunctions For L1 Speakers

L1 speakers	Monologue (N = 20)			Dialogue (N = 24)		
Frequency	simp	comp	tot	simp	comp	tot
als. . .dan/if. . .then	81	74	155	104	98	202
daarom/therefore	7	5	12	10	2	12
dus/so	98	112	210	70	62	132
en/and	314	351	665	252	309	561
maar/but	70	91	161	125	128	253
of/or	20	45	65	38	56	94
omdat/because	24	33	57	20	14	34
om. . .te/in order to	35	32	67	39	31	70
toch/even so	26	26	52	39	33	72
want/because	21	23	44	34	32	66
10 low freq. conj.	9	13	22	13	9	22
tot. all 20 conj.	705	805	1510	744	774	1518

Note. L1 = first language; N = number of participants; simp = simple; comp = complex; tot = total; 10 low freq. conj. = sum of other 10 low frequent conjunctions; tot. all 20 conj. = absolute total of all 20 conjunctions

TABLE 5

Absolute Numbers For The Occurrence Of Conjunctions For L1 Speakers

L1 speakers	Monologue (N = 20)			Dialogue (N = 24)		
Occurrence	simp	comp	tot	simp	comp	tot
	% (n)	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*
als. . .dan/if. . .then	90 (18)	95 (19)	100 (20)	96 (23)	88 (21)	100 (24)
daarom/therefore	30 (6)	25 (5)	45 (9)	25 (6)	8 (2)	29 (7)
dus/so	100 (20)	100 (20)	100 (20)	96 (23)	83 (20)	100 (24)
en/and	100 (20)	100 (20)	100 (20)	100 (24)	100 (24)	100 (24)
maar/but	95 (19)	100 (20)	100 (20)	92 (22)	92 (22)	96 (23)
of/or	55 (11)	80 (16)	85 (17)	67 (16)	79 (19)	92 (22)
omdat/because	70 (14)	65 (13)	80 (16)	46 (11)	29 (7)	63 (15)
om. . .te/in order to	65 (13)	65 (13)	100 (20)	54 (13)	54 (13)	75 (18)
toch/even so	60 (12)	70 (14)	85 (17)	63 (15)	54 (13)	83 (20)
want/because	70 (14)	50 (10)	80 (16)	71 (17)	67 (16)	88 (21)
10 low freq. conj.	35 (14)	45 (9)	70 (14)	46 (11)	33 (8)	75 (18)
tot. all 20 conj.	15	15	15	16	15	17

Note. L1 = first language; N = number of participants; simp = simple; comp = complex; tot = total; n = number of performances where a conjunction was used; % = percentage of performances; 10 low freq. conj. = sum of other 10 low frequent conjunctions; tot. all 20 conj. = total number of different conjunctions used in all the performances

TABLE 6

Descriptive Statistics: Frequency And Occurrence Of All Conjunctions

Descriptives	L2 learners			L1 speakers		
	mono (N =32)	dia (N =32)	tot (N = 64)	mono (N =20)	dia (N =24)	tot (N = 44)
Frequency	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*
simple	12.33/ 3.38	11.23/ 2.69	11.78/ 3.08	11.62/ 2.43	10.72/ 1.78	11.13/ 2.12
complex	11.57/ 3.00	11.82/ 2.45	11.70/ 2.72	11.74/ 1.92	10.38/ 2.04	11.00/ 2.08
total	11.85/ 2.77	11.51/ 2.31	11.68/ 2.54	11.68/ 1.79	10.63/ 1.45	11.11/ 1.68
Occurrence	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*	*Mn/ SD*
simple	5.47/ 1.50	5.75/ 1.39	5.61/ 1.44	7.70/ 1.56	7.54/ 1.67	7.61/ 1.60
complex	5.66/ 1.66	6.22/ 1.60	5.94/ 1.64	7.95/ 1.23	6.88/ 1.87	7.36/ 1.69
total	7.13/ 1.34	7.25/ 1.63	7.19/ 1.48	9.45/ 1.36	9.00/ 1.91	9.20/ 1.68

Note. L2-learner = second language learner; L1-speaker = native speaker; N = number of participants; frequency = mean number of conjunctions per 100 words; occurrence = mean number of conjunctions used at least once in a performance; Mn = Mean; SD = standard deviation

TABLE 7

Statistics On Frequency And Occurrence Of All Conjunctions

Effects	L2 learners					L1 speakers				
Multivariate	*Pill. Tr.*	*F*	*df*, *Err*	*p*	η_p^2	*Pill. Tr.*	*F*	*df*, *Err*	*p*	η_p^2
task compl.	.046	1.482	2,61	.235	.046	.017	0.346	2,41	.709	.017
interaction	.036	1.135	2,61	.328	.036	.126	2.966	2,41	.063	.126
task compl. x interaction	.064	2.073	2,61	.135	.064	.036	1.135	2,41	.328	.036
Univariate	meas.	*F*	*df*, *Err*	*MSQ*	*p*	η_p^2	meas.	*F*	*df*, *Err*	*MSQ*	*p*	η_p^2
task compl.	freq.	0.057	1,62	0.221	.812	.001	freq.	0.083	1,42	0.277	.774	.002
	occ.	2.909	1,62	3.445	.093	.045	occ.	0.691	1,42	0.947	.410	.016
interaction	freq.	0.446	1,62	5.763	.507	.007	freq.	5.517	1,42	27.707	.024*	.116
	occ.	1.596	1,62	5.695	.211	.025	occ.	2.149	1,42	8.297	.150	.049
task compl. X interaction	freq.	3.807	1,62	14.749	.056	.058	freq.	0.334	1,42	1.111	.566	.008
	occ.	0.534	1,62	0.633	.468	.009	occ.	3.345	1,42	4.583	.074	.074

Note. L2 = second language; L1 = native speaker; N = number of participants; meas. = measure; freq. = number of conjunctions per 100 words; occ. = number of conjunctions used at least once; task compl. = task complexity; Pill. Tr. = Pillai's Trace; df, Err. = degrees of freedom, Error df.; MSQ = Mean Square Error; η_p^2 = effect size; * = significant at $p < 0.05$.

TABLE 8

Descriptive Statistics: Highly Relevant Conjunctions For L2 Learners

L2 learners		want (because)		omdat (because)		daarom (therefore)		daardoor (therefore)		als. . .dan (if. . .then)	
Frequency		*Mn / SD*		*Mn / SD*		*Mn / SD*		*Mn / SD*		*Mn / SD*	
mono	simp	0.54 /0.78		0.55 /0.64		0.30 /0.62		0.00 /0.00		0.42 /0.41	
	comp	0.55 /0.85		0.34 /0.53		0.15 /0.39		0.01 /0.07		0.42 /0.54	
dia	simp	0.52 /0.57		0.26 /0.47		0.17 /0.29		0.02 /0.09		1.75 /1.04	
	comp	0.36 /0.51		0.26 /0.52		0.13 /0.28		0.00 /0.00		1.97 /0.99	
Occurrence		*N*	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*
mono	simp	14	(44)	<u>19</u>	<u>(59)</u>	9	(28)	0	(0)	19	(59)
	comp	16	(50)	<u>12</u>	<u>(38)</u>	7	(22)	1	(3)	17	(53)
dia	simp	18	(56)	10	(31)	9	(28)	1	(3)	29	(91)
	comp	15	(47)	12	(38)	7	(22)	0	(0)	31	(97)

Note. L2 = second language; frequency = number of conjunctions per 100 words; occurrence = absolute number N (and percentage %) of participants using a conjunction at least once; mono = monologue; dia = dialogue; simp = simple; comp = complex; Mn = mean; SD = standard deviation; the only significant difference is underlined

TABLE 9

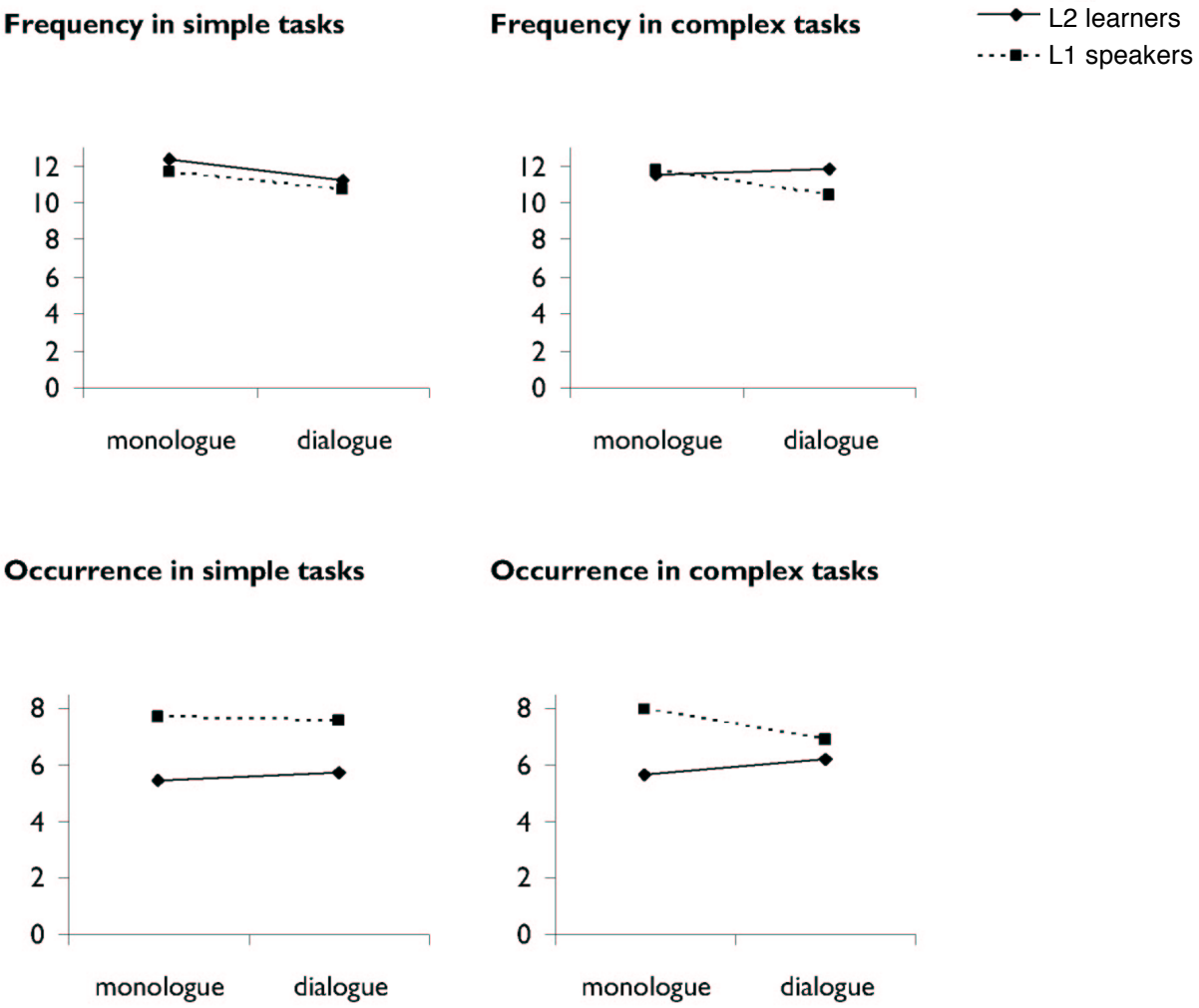
Descriptive Statistics: Highly Relevant Conjunctions For L1 Speakers

L1 speakers		want (because)		omdat (because)		daarom (therefore)		daardoor (therefore)		als. . .dan (if. . .then)	
Frequency		*Mn / SD*		*Mn / SD*		*Mn / SD*		*Mn / SD*		*Mn / SD*	
mono	simp	0.35 / 0.33		0.59 / 0.55		0.00 / 0.00		0.12 / 0.22		1.26 / 0.88	
	comp	0.32 / 0.40		0.48 / 0.52		0.00 / 0.00		0.09 / 0.16		1.05 / 0.56	
dia	simp	0.52 / 0.47		0.55 / 0.68		<u>0.13 / 0.26</u>		0.04 / 0.13		1.50 / 0.86	
	comp	0.46 / 0.51		0.44 / 0.60		<u>0.01 / 0.05</u>		0.03 / 0.09		1.21 / 0.84	
Occurrence		*N*	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*
mono	simp	14	(70)	14	(70)	0	(0)	6	(30)	18	(90)
	comp	10	(50)	13	(65)	0	(0)	5	(25)	19	(95)
dia	simp	17	(71)	13	(54)	6	(25)	2	(8)	23	(96)
	comp	16	(67)	13	(54)	2	(8)	3	(13)	21	(88)

Note. L1 = first language; frequency = number of conjunctions per 100 words; occurrence = absolute number N (and percentage %) of participants using a conjunction at least once; mono = monologue; dia = dialogue; simp = simple; comp = complex; Mn = Mean; SD = standard deviation; the only significant difference is underlined

FIGURE 1

Differential Effects Of Interaction In L2 Learners And L1 Speakers On The Overall Use Of Conjunctions.



Note. In L1 speakers there is a significant main effect of interaction on the frequency of conjunctions such that, irrespective of task complexity, monologues yield higher scores than dialogues: $F(42,1) = 5.517$; $MSQ = 27.707$; $p < .05$; $\eta_p^2 = .116$.