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An investigation into near-nativeness at the syntax-lexicon interface: evidence from Dutch learners of English

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To my parents

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ii. Declaration

This thesis has been composed by myself, and the research presented herein is my own. No portion of the work has been submitted for any other degree or professional qualification.

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iii. Abstract

This thesis investigates whether there are differences in language comprehension and language production between highly advanced/near-native adult learners of a second language (late L2ers) and native speakers (L1ers), and if so, how they should be characterised. In previous literature (Sorace & Filiaci 2006, Sorace 2011 *inter alia*), non-convergence of the near-native grammar with the native grammar has been identified as most likely to occur at the interface between syntax and another cognitive domain. This thesis focuses on grammatical and ungrammatical representations at the syntax-lexicon interface between very advanced/near-native Dutch learners of English and native speakers of English. We tested differences in syntactic knowledge representations and real-time processing through eight experiments. By syntactic knowledge representations we mean the explicit knowledge of grammar (specifically word order dependence on lexical-semantics) that a language user exhibits in their language comprehension and production, and by real-time processing we mean the language user's ability to access implicit and explicit knowledge of grammar under time and/or memory constraints in their language comprehension and production.

To test for systematic differences at the syntax-lexicon interface we examined linguistic structures in English that differ minimally in word order from Dutch depending on the presence or absence of certain lexical items and their characteristics; these were possessive structures with animate and inanimate possessors and possessums in either a prenominal or postnominal construction, preposed adverbials of location (locative inversions) followed by either unergative or unaccusative verbs, and preposed adverbials of manner containing a negative polarity item (negative inversions) or positive polarity item followed by either V2 or V3 word order. We used Magnitude Estimation Tasks and Speeded Grammaticality Judgement Tasks to test comprehension, and Syntactic Priming (with/without extra memory load) and Speeded Sentence Completion Tasks to test production. We found evidence for differences in comprehension and production between very advanced, near-native Dutch L2ers and native speakers of English, and that these differences appear to be associated with processing rather than with competence. Dutch L2ers differed from English L1ers with respect to preferences in word order of possessive structures and after preposed adverbials of manner. However, these groups did not differ in production and comprehension with respect to transitivity in locative inversions.

We conclude that even among highly advanced to near-native late learners of a second language there may be non-convergence of the L2 grammar. Such non-convergence

need not coincide with the L1 grammar but may rather be a result of over-applying linguistic L2 knowledge. Thus, very advanced to near-native L2ers still have access to limited (meta)linguistic resources that under time and memory constraints may result in ungrammatical language comprehension and/or production at the syntax-lexicon interface.

In sum, in explaining interface phenomena, the results of this study provide evidence for a processing account over a representational account, *i.e.* Dutch L2ers showed they possess grammatical knowledge of the specific L2 linguistic structures in comprehension and production, but over-applied this knowledge in exceptional cases under time and/or memory pressure. We suggest that current bilingual production models focus more on working memory by including a separate memory component to such models and conducting empirical research to test its influence on L2 production and comprehension.

iv. Acknowledgements

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Chapter 1 Introduction

People who speak a second language but have not been raised to speak a second language from early age on, so-called *late second language learners* (roughly from seven years of age and onwards), often find that learning and speaking a second language comes less naturally to them than it does for *early second language learners* (roughly between birth and seven years of age). Although late second language learners are capable of reaching high proficiencies in languages other than their native tongue, even reaching near-native like levels, the chances of their competence and/or performance in their second language (*L2*) being divergent from native speakers (*L1 speakers*) is considerably higher for them than for early second language learners. This non-native-like divergence could be manifested as *e.g.* an accent in their spoken language production, or using an unlikely combination of words in a collocation, or just simply using the wrong preposition in a sentence. In more linguistic terms, there is a possibilityof non-convergence in the phonological, lexical, semantic and/or syntactic domains, or –as we shall see later on– a non-convergence in a cross-section of these domains (so-called *interfaces*).

The study that investigates how people acquire a second language, *i.e.* which phases they go through and what the end product looks like, is called Second Language Acquisition (SLA) research. One of the questions SLA research deals with is why it is so difficult to become native-like in a second language for late second language learners, and another more specific one is whether it is possible at all to become native-like in all domains of a second language for a late second language learner. In more practical terms, can these non-native speakers reach an end stage in their second language acquisition (also *L2 end stage* or *ultimate L2 attainment*) where they are no longer singled out as being non-native by native speakers of that language, *i.e.* reach *native-like proficiency*? Or will there always be a certain area or domain in their second language acquisition that cannot reach native-like or near-native potential? And which of these would be most likely to be divergent from the native speakers'? This thesis investigates *near-nativeness* among late second language learners and to what extent it differs from nativeness. In doing so, I will examine second language comprehension and production of highly advanced to near-native late second language learners and compare these to native speaker comprehension and production.

When looking for highly advanced to near-native late second language learners, there are several factors that –if combined together– could result in acquiring a suitable and sufficient population of participants. First of all, the first and second language pairs spoken by this population should not differ too drastically typologically; *i.e.* the closer the linguistic

systems of the L1 and L2 are, the greater the potential facilitating effects of the L1 on the L2 are and so the greater the chances of finding proficient L2 speakers. Secondly, when L1 speakers have more than sufficient resources to acquire a particular L2, the chances of them becoming a highly proficient L2 speaker increases as well. Taking these factors into account resulted in us targeting near-nativeness in highly proficient Dutch learners of English.

The Dutch language is typologically the closest Germanic language to English, and with many Dutch people starting to learn English in the Netherlands between the ages of seven and twelve years old, this provides a good formula for finding highly proficient to near-native late second language learners. Besides formal instruction in English in the later forms of primary schools and throughout secondary and post-secondary schools, the Dutch are also widely exposed to English in the media, entertainment industry, and through business. For example, English TV broadcasts and films are not dubbed but subtitled, there are many English bookshops in the Netherlands and Dutch bookshops carry broad selections of English literature and news papers, most households have access to BBC radio/TV and internet, and since the Dutch have one of the world's biggest stakes in import and export businesses, most of these business transactions are conducted in English, and finally all postgraduate courses at universities in the Netherlands are taught and examined in English.

It has been shown that late L2 learners may reach very high proficiency standards (White & Genessee 1996), even becoming native-like in several L2 domains, though newer research is now looking into the fact that L2 learners cannot become native-like in *all* domains, or in certain domains overlapping one another (so-called *interfaces*). Recent L2 research on near-nativeness is exploring differences in comprehension and production between native and near-native speakers regarding certain interface phenomena (Sorace & Filiaci 2006, Hopp 2009, 2010, Sorace 2011 *inter alia*) though certain interfaces are more researched than others, particularly the syntax-discourse interface. This research targets the lesser examined syntax-lexicon interface. It specifically examines near-nativeness among very advanced/near-native Dutch learners of English who have reached the L2 end stage of their acquisition of English syntax. The focus here is on how specific semantic properties of English words influence word order in an English sentence, *i.e.* it investigates *lexical-semantic word order dependence* in the ultimate L2 attainment of these late second language learners at the syntax-lexicon interface.

It is relatively easy to investigate differences in comprehension and production of Dutch and English linguistic structures that target word order differences determined by lexical cues as these structures are abundant in both Dutch and English and vary only slightly. Structures at this interface can be easily tested as the specific characteristics of one

word in a sentence (*i.e.* in the lexical domain) may influence the word order of the sentence (the syntactic domain). For example, this study investigated how the animacy of possessor nouns affects the word order in genitive constructions (prenominal vs postnominal), and how transitivity of the main lexical verb (unaccusative vs unergative) affects the possibility of inverted word order (*i.e.* preposed locative adverbials followed by verb and subject), or how lexical items with a certain polarity affect word order after preposed adverbials of manner (V2 with negative polarity vs V3 with positive polarity).

In order to investigate this empirically I present several linguistic experiments that targeted particular linguistic structures in which participants had ample time and memory resources to monitor their L2 comprehension and production (*offline task*) and in which they did not (*online task*). The time resources under which these structures were tested were controlled for by having the participants perform a task in which there was no time stress (offline task) or a task in which they were put under considerable time pressure by forcing a time window on them in which they had to respond to the stimuli (online task). Similarly, memory resources available to the participants were controlled for by having participants perform an additional task at the same time (online task) or have them focus on one single task only (offline task). In sum, the offline tasks were implemented to test and check for knowledge of how the English language is constructed (*metalinguistic knowledge*) and knowledge of particular English linguistic structures (*syntactic knowledge*) among second language learners and native speakers of English, *i.e.* testing underlying *competence*. The online tasks were implemented to test to what extent L2 learners' *access* to metalinguistic and syntactic knowledge of grammar were affected by the imposed time and memory constraints compared to native speaker access to these resources, *i.e.* testing *performance*. Besides investigating potential non-convergence between language learners and native speakers, this study also examines whether there is non-convergence between comprehension and production between and within these different language groups, and whether a difference in these registers can be contributed to offline and online test conditions.

1.1. Organisation of the thesis

The second chapter begins by considering the current state of near-native research and continues with a concise literature overview on research on language processing and how this links with near-native research before it delves into more detail on which particular linguistic structures are investigated in this study and why. The linguistic structures, *i.e.* differences in word order in possessive structures and word order after preposed adverbials

of location and manner between Dutch and English are explained before reviewing this in the context of near-native research on interfaces. Following this review, certain gaps in interface research are highlighted which this study aims to address. The chapter presents research questions, hypotheses and subsequent predictions before ending with a summary on what is already known and what this study's contribution is to research on near-nativeness and interfaces.

The third chapter presents the means this study adopted to answer the research questions raised in the previous chapter. It justifies and motivates the empirical approach to test the hypotheses, explains which methodologies were used, and why specifically these methods and not others. In addition, it explains how the targeted linguistic structures are empirically tested in this research, and how it sets about to control for all factors involved in testing these. In doing so it provides examples of stimuli and trials. It also justifies which measures were taken to ensure a task was either testing offline or online comprehension and production of these linguistic structures. Finally, it presents and justifies the different measures taken to ensure the Dutch L2 learner's proficiency in the adopted experiments equalled the highly advanced/near-native level associated with the final stages of L2 acquisition.

The fourth chapter presents and discusses in detail the specifics of a timed Magnitude Estimation Task and a Syntactic Priming Task on word order in Dutch and English possessive structures, where the focus is on the position of the possessor in relation to the possessum noun within the genitive construction (prenominal vs postnominal). It reports the methodology, participants, materials, procedure, analyses, results, discussion and a summary of the findings of these tasks. The aim of the experiments was to examine to what extent Dutch learners of English were aware of lexical-semantic animacy constraints on word order in possessive structures in offline L2 comprehension and in online L2 production. The data were analysed by means of two different statistical techniques (ANOVA and LME) and elaborately discussed before summarising and comparing the findings of the language comprehension and production tasks at the end of the chapter.

The fifth chapter presents and discusses the details of a timed Magnitude Estimation Task and a Syntactic Priming Task on word order in English sentences with preposed adverbials of location and manner, where the focus is on the position of the subject in relation to the main verb (preverbal vs postverbal), *i.e.* V2 or V3 word order. The aim of these experiments was to examine to what extent Dutch learners of English were aware of lexical-semantic constraints on verb order in their offline L2 comprehension and in their online L2 production (to be more precise constraints of verb type on locative inversion, and

constraints of polarity items on word order in sentences starting with preposed adverbials of manner). Detailed information on the participants, materials, procedure, analyses, results and discussion is provided before the chapter ends with a summary and comparison between the findings of the language comprehension and production tasks.

The sixth chapter reports the specifics of four online tasks (three production tasks and one comprehension task) that targeted word order in sentences starting with an adverbial of manner. The objectives of these experiments were to examine to what extent Dutch learners of English have *access* (under stressed conditions) to metalinguistic knowledge of lexical-semantic word order dependence in sentences starting with preposed adverbials of manner, as the experiments in the previous chapters showed near-native L2 learners were still able to carefully monitor their L2 comprehension and production in *online* tasks. The first production task was a Syntactic Priming Task setting the base results against which the results of the other tasks were compared. The subsequent production experiments enforced memory and time limitations on the participants by respectively adding a Digit Recall Task to a Syntactic Priming Task, and a countdown timer to a Sentence Completion Task. These measures would ensure that participants could no longer monitor their comprehension and production carefully. The last experiment was a comprehension experiment under time pressure in which participants were only given a brief time window to judge the grammaticality of sentences. As this experiment was conducted among the same participants as the speeded Sentence Completion Task, this enabled us to draw a direct comparison between language comprehension and production. The chapter finishes with a summary and comparisons between all of the experiments conducted.

The seventh chapter starts with an overview of the overall results of the experiments and discusses the similarities and differences in the empirical patterns found in these results. We then discuss to what extent these results can be generalised, followed by a more detailed discussion per linguistic structure tested. We draw conclusions based on the elicited data in the experiments and answer the general and specific research questions that were posed in the second chapter. The implications of these answers are discussed in light of second language acquisition theories on near-nativeness, which are then followed by refinements of these theories. We propose how these refinements can be captured in processing models, and discuss what potential issues remain to be resolved. Finally, the chapter finishes with general directions and recommendations for further research.

Chapter 2 Previous research on near-nativeness

2.1. Chapter overview

The previous chapter raised the issue of late second language learners' difficulty in reaching near-native proficiency across all domains and interfaces of their second language. This chapter examines the background of this issue and its consequences for future research on near-nativeness by splitting the chapter into three sections: 1) SLA theory, 2) relevant linguistic structures, 3) research questions and predictions. In the first section, we will discuss previous SLA research on near-nativeness, and in doing so provide the definitions and terminology that comes with it. In addition, we will discuss theoretical frameworks of different bilingual production models by means of a literature review. The literature review shows that differences established in comprehension and production between native speakers and near-native speakers are most likely to occur at certain interfaces, and that there are research gaps in this area remaining to be filled. In the second section we will go into the minute details of relevant characteristics of linguistic structures we adopted for testing interface phenomena among advanced L2 learners, near-native speakers and native speakers for our research. Finally, in the third section, this chapter presents the thesis' specific research questions and proposes how to address these by conducting experimental research on certain linguistic structures.

Section 1: SLA theory

2.2. Introduction

Empirically it has widely been established that the end state of adult second language (L2) learners of a particular target language differs in certain aspects from the end state of first language (L1) learners of that same particular language (Coppieters 1987, Long 1990, Sorace 1993, Felser et al. 2003, Hawkins & Hattori 2006 *inter alia*). Only very few L2 learners reach *near-native proficiency* –according to Selinker (1972) and Birdsong (1999) as little as 5-15% of all L2 learners– where near-native proficiency is defined as "second language proficiency levels that are not identical to native-like levels but that fall short above the limit of perceivable non-nativeness" (Hyltenstam & Abrahamsson 2000: 163); the vast majority of highly advanced L2 learners often reach the 90-95% proficiency level, with native-like accent as the last and most difficult feature to master (Selinker 1972, Coppieters 1987, Birdsong 1999 *inter alia*). As this definition of near-native proficiency is not very concrete and our study aims to test near-nativeness among L2 learners, we adopt a more practical definition in which *near-nativeness* is defined as 'a high level of proficiency in both

L2 syntax and L2 phonology by the L2 learner, such that a native speaker of that language is not able to single out the L2 learner as being a non-native speaker of that language' (one can see this is more easily testable than Hyltenstam & Abrahamsson's definition of near-native proficiency).

Research on near-nativeness primarily focuses on the final stage(s) of language development by the second language learner, *i.e.* the stage in which they seem to no longer progress towards the native-like standard in any linguistic domain in their acquisition of the second language; this is also called the *L2 end stage*. Second language learners who have reached this stage and still produce non-native-like structures in one of the linguistic domains (*e.g.* syntax, phonology *etc.*) in their second language are said to be subject to *fossilization*, a term introduced by Selinker (1972), where these non-target like structures are labelled as "fossilizable linguistic phenomena" and defined as "linguistic items, rules, and subsystems which speakers of a particular NL [native language; L1] will tend to keep in their IL [interlanguage] relative to a particular TL [target language; L2], no matter what the age of the learner or amount of explanation and instruction he receives in the TL [target language; L2]" (p. 215). Though, the direction in current research on near-nativeness (Lardiere 2006 a.o.) focuses not so much on L2 learners' failures but more on the general picture of that which has been attained by the L2 learner, also referred to as *L2 ultimate attainment*. This term is more neutral in a sense that it does not carry negative connotations and encompasses a much broader and more accurate definition of the second language learner's success at acquiring a second language. Moreover, L2 ultimate attainment defines the L2 learner's end stage, which can be compared against other L2 learners' end stages. Besides cross-comparisons between L2 learners' end stages, it is through this L2 ultimate attainment that linguists can 'backtrack' to begin to understand the nature of the L2 acquisition system: *i.e.* how an L2 is acquired given that the L2 learner already possesses an L1.

Early studies on near-nativeness examining performance and competence at the L2 end state of late second language learners have showed that near-native grammars are often slightly *divergent* (Coppieters 1987, Sorace 1993, Sorace 2000) and/or *incomplete* (Sorace 1993) compared to native speaker grammars, where divergence is defined as "interlanguage representations of L2 properties that are consistently different from native representations" and incompleteness as "a lack of given L2 properties" resulting in inconsistent differences (Sorace 1993: 22). Coppieters' (1987) study on native and near-native speakers of French showed a divergence in interpretations between these groups in sentences with grammatical contrasts concerning:

a) the two past tenses *imparfait* and *passé compose, e.g.*

   {Il a soupçonné / Il soupçonnait} quelque chose, j'en suis sûr.

   'He suspected something, I am sure of it.'

b) 3rd person pronouns *il/elle* and *ce, e.g.*

   *Tu vois ce type-là, {*il/c'} est l'idiot qui a renversé mon verre.*

   'You see that guy over there, that's the idiot who spilled the contents of my glass.'

c) placements of adjectives before or after nouns, *e.g.*

   Voilà {une triste histoire / une histoire triste}.

   'That's a sad story.'

(Coppieters 1987: 555-559)

In the first grammatical contrast (a) near-native speakers of French often judged the sentences with different tenses to mean the same thing, whereas native speakers of French did not. So in the example sentence with the *passé composé* they interpreted the sentence as 'he suddenly realized something', but in the example sentence with the *imparfait* they interpreted the sentence as 'he was already suspicious before we went to see him.' In the second grammatical contrast (b) near-native speakers of French often judged both pronoun options to be grammatical, whereas native speakers of French only judged the *ce* option to be grammatical in those contexts. In the final grammatical contrast (c) near-native speakers of French often did not assign different interpretations to sentences with different word orders, whereas the native speakers of French did. So in the first option of the example sentence, the native speakers of French interpreted "*une triste histoire*" as 'a bad emberassing problem', and in the second option "*une histoire triste*" as 'a story that makes you cry'. However, the data also indicated that near-native competence diverged less from native competence with respect to formal grammatical features than 'functional' or 'cognitive' aspects of grammar (cf. interface phenomena).

Sorace's (1993) study on representations of unaccusativity in Italian among near-native English and French speakers of Italian showed that in the former group the near-native grammar was incomplete, whereas in the latter it was divergent. According to Sorace this translates as English near-native speakers of Italian producing random, inconsistent and indeterminate judgements on Italian unaccusativity (since they lack the L2 property), and French near-native speakers of Italian producing determinate judgements consistently divergent from native speaker judgements (since they have an alternative representation of the L2 property). These predictions were empirically tested by means of a Magnitude Estimation Task (see Chapter 3 for a detailed discussion on this methodology), where the

participants mentioned above were asked to judge how well they thought Italian sentences with certain unaccusative verbs pair with auxiliaries *avere* ('to have') and *essere* ('to be'). In Italian there are four auxiliary-unaccusative configurations possible:

a) Obligatory *essere*-selection with five classes of unaccusative verbs along the Unaccusative Hierarchy (Perlmutter 1978, 1989 *inter alia*):

   i. Change of location, *e.g.*
      – *Maria è venuta alla festa da sola.*
        'Maria came to the party alone.'
   ii. Continuation of a state, *e.g.*
      – *Paola è rimasta da me fino a tardi.*
        'Paola stayed at my place until late.'
   iii. Existence of a state, *e.g.*
      – *I dinosauri sono esistiti milioni di anni fa.*
        'Dinosaurs existed a million years ago.'
   iv. Unaccusative with transitive alternant, *e.g.*
      – *I prezzi sono aumentati del 20%.*
        'Prices increased by 20%.'
   v. Unaccusative with unergative alternant, *e.g.*
      – *Paola è corsa in farmacia.*
        'Paola ran to the chemist's.'

b) Optional auxiliary change between *avere* and *essere* in basic restructuring constructions:

   – *Maria non ha potuto venire alla mia festa.*
     'Maria couldn't come to my party.'
   – *Mia figlia non è potuta venire a scuola.*
     'My daughter couldn't come to school.'

c) Optional auxiliary change between *avere* and *essere* in restructuring constructions with raising verbs, where the clitic remains attached to the embedded verb:

   – *Alla mia festa, Maria non ha potuto andarci.*
     'To my party, Maria couldn't go.'
   – *A scuola, mia figlia non è potuta venirci.*
     'To school, my daughter couldn't come.'

d) Obligatory auxiliary change from *avere* to *essere* in restructuring constructions with raising verbs, where the clitic 'climbs' to the main verb:

   – **Alla mia festa, Maria non ci ha potuto andare.*
     'To my party, Maria couldn't go.'
   – *A scuola, mia figlia non ci è potuta venire.*
     'To school, my daughter couldn't come.'

(Sorace 1993: 33-34)

Sorace's findings were as follows: 1) near-native and native speaker intuitions differed significantly with respect to unaccusativity in Italian, 2) both French and English near-native speakers of Italian were sensitive to the semantic categories along the Unaccusative Hierarchy, 3) French near-native speakers of Italian showed determinate (but not always native-like) intuitions, whereas English near-native speakers of Italian showed inconsistent and indeterminate intuitions with respect to the syntactic phenomena of restructuring. These findings confirmed Coppieters' (1987) findings: near-native speakers can perform native-like despite the fact that their knowledge representations are significantly different from native speakers (particularly with respect to restructuring constructions). So similarities in performance between near-native and native speakers do not necessarily imply similarities in competence.

However, White & Genessee (1996) claim that native-like competence is achievable among late second language learners. In their seminal study on near-nativeness, they claim to have tested true near-native speakers of an L2, whereas they claim previous studies on near-nativeness have too often included highly advanced but not near-native speakers (pp. 233-235). They proposed to measure near-native L2 proficiency among the French L2 learners of English in their experiment by recording language samples of the L2 learners whilst they were interviewed on pictures drawn from the Thematic Apperception Test (Murray 1971, see Chapter 3 for more detail). The recordings of these semi-structured interviews were played back to two native speakers of English who then had to rate the speaker on pronunciation, morphology, syntax, choice of vocabulary, fluency and overall impression of nativeness on a 9 cm straight line (cf. Magnitude Estimation). Near-native speech samples were interspersed with native speech samples and the native speaker judges were not informed on the source of the speech samples as to ensure an objective evaluation. The next chapter discusses the specifics of this methodology in more detail as our study adopted this method too. The specific linguistic structures White & Genessee focused on in these speech samples targeted *Subjacency* and the *Empty Category Principle* (ECP) – both principles have proved to be substantial components in *Universal Grammar* (UG), *i.e.* innate knowledge guiding a language learner in their language acquisition (Chomsky 1986, Haegeman 1991, Chomsky 1995 *inter alia*). Below follows a brief description of these principles and how and why performance on linguistic structures concerning these principles can act as an assessment of near-nativeness.

Subjaceny in English is defined as the prohibition of a move α (including *wh*-movement) over more than one bounding node at a time, where the bounding nodes are IPs, overt CPs and NPs. So when at least two bounding nodes intervene between a moved *wh*-

phrase and its trace, this implies a subjacency violation; *e.g.* when complex NPs (1 and 2), objects (3), and subjects (4) intervene between a *wh*-phrase and its trace.

1) *What$_i$ [$_{IP}$ did Mary believe [$_{NP}$ the claim [$_{CP}$ t_i that [$_{IP}$ John saw t_i]]]] ?
2) *Who$_i$ [$_{IP}$ did Mary meet [$_{NP}$ the man [$_{CP}$ who [$_{IP}$ saw t_i]]]] ?
3) *Who$_i$ [$_{IP}$ did Mary meet the man [$_{CP}$ after [$_{IP}$ she saw t_i]]] ?
4) *What$_i$ [$_{IP}$ was [$_{NP}$ a dish of t_i] cooked by Mary] ?

The Empty Category Principle ties in closely with Subjacency: it states that traces must be governed properly. This means that α properly governs constituent β if and only if α governs β and α is a lexical category and α and β are co-indexed (for a further technical definition and explanation I refer to Haegeman 1991: 442). If traces are not properly governed this may lead to violations of the Empty Category principle, *e.g.* sentence (5) below, where the complementiser 'that' (overt CP acting as a barrier) prevents the *wh*-phrase to govern its trace (this is also called the *that-trace effect*).

5) *Who$_i$ do you think [$_{CP}$ t_i that [$_{IP}$ t_i arrived yesterday]] ?

The Subjacency and Empty Category Principles are not taught explicitly to language learners, but emerge in their UG implicitly upon acquiring a language.[1] White & Genessee addressed French learners of English: both French and English are subjected to Subjacency and ECP in similar though not exactly the same ways. They argued that testing for these principles in the learners' L2 taps into the learner's access to UG, and therefore tests for a *critical period* among second language learners. That is, the period language learners have unrestrained access to UG before maturational constraints restrict this access.

The methods White & Genessee adopted to test L2 competence among near-natives were: a binary Grammaticality Judgement Task and a Question Formation Task. In the first task participants were asked to judge *wh*-questions with or without Subjacency/ECP violations as grammatical or ungrammatical. Not only were their sentence judgements recorded, but also the time it took them to arrive at these judgements. In the second task, participants were presented with declarative sentences with underlined phrases and asked to form questions questioning these underlined items. The questions elicited were either grammatical or ungrammatical (in which case the participant must have violated Subjacency/ECP). The results of this study revealed that near-native French learners of

[1] Note however that this does not necessarily apply to Japanese, Korean or Chinese native speakers learning an L2 with these priniples as their respective L1s do not have syntactic *wh*-movements.

English performed similarly to native speakers of English on all tasks, suggesting that "ultimate attainment in an L2 can indeed be native-like in the UG domain […] hence, [there is] no critical period in this domain" (p. 258).

However, recent research on near-native competence by Hawkins & Hattori (2006) confirms that near-native grammars can be incomplete despite native-like performance. Hawkins & Hattori's (2006) study on highly proficient Japanese learners of English revealed that these highly proficient L2 learners are still significantly less sensitive to *subjacency* effects in multiple-*wh*-questions than native speakers of English. That is, Japanese learners of English answered sentences as "*Where did the professor say when the students studied?" by choosing to answer either one (*where*) or the other (*when*) reading, whereas English native speakers only answered the *when* reading. So the Japanese learners of English did not judge the sentence to be as ungrammatical to the same degree as the native speakers of English did. For English native speakers, the ungrammaticality in this sentence is that the *wh*-interrogative pronoun 'where' cannot move out of the embedded clause ("when the students studied *where"*) to the matrix clause due to a boundary node (the other interrogative *wh*-pronoun *when*). The reason for this difference in readings is that Japanese is a *wh*-in-situ language, where an interrogative *wh*-pronoun like *what, why, when* may appear in the middle of a sentence. This, however, is not the case for English, and as a result of this difference highly proficient Japanese learners of English could judge English sentences with a subjacency violation like the one above as grammatical. Hawkins & Hattori's explanation follows Tsimpli's (2003) *Interpretability Hypothesis*: "uninterpretable syntactic features [*e.g.* subjacency] that have not been selected during first language (L1) acquisition will not be available for L2 grammar construction" (p. 269). So like Sorace (1993), Hawkins & Hattori conclude that even though performance of highly proficient L2 learners may seem native-like, this does not automatically mean that the underlying grammatical representations (*i.e.* competence) of these L2 learners are the same as those of native speakers.

Differences between native and near-native competence and performance cannot only be attributed to a difference in underlying grammatical representations between the two populations, but also to differences in processing capacities and accessibility to resources. Clahsen & Felser (2006) discuss evidence for differences between L1 and L2 processing of complex syntax. The specific linguistic structures they investigated dealt with restrictions on *non-local syntactic dependencies*, like (6) *wh*-questions spanning several clauses, and (7) co-reference in complex clauses with reflexive anaphors.

6) a) *Which*$_i$ book did Mary think John believed the student had borrowed t_i?
   b) **Which*$_i$ book did Mary think John believed the student who borrowed t_i?
7) a) Jane believed Alice$_i$ to have over-exerted herself$_i$.
   b) Jane$_i$ seemed to Alice to have over-exerted herself$_i$.

Studies by Love et al. (2003), Marinis et al. (2005), and Felser & Roberts (2007) revealed that in online processing highly proficient L2 learners of English interpret and process the (b) sentences above in a non-native-like fashion, *i.e.* hierarchical phrase structure representations were computed locally (versus non-locally by native speakers of English). So (6b) was accepted on more occasions by highly proficient L2 learners than native speakers, and in (7b) more highly proficient L2 learners allowed the adjacent noun phrase 'Alice' to refer to the reflexive pronoun 'herself' than native speakers of English did. Clahsen & Felser (2006) concluded that the processing strategy adopted by the L2 learners relied more on lexical-semantic information and less on hierarchical constituent structure. Consequently, they have dubbed this theory about L2 processing *shallow parsing*. The overall conclusion is that highly proficient speakers are capable of reaching native-like processing skills with respect to locally related constituents, but when non-local dependencies are involved these L2 learners show non-native-like processing strategies in the real-time computation of complex hierarchical representations. However it has to be pointed out that it was unclear how highly proficient these L2 learners were, *i.e.* whether they had reached their L2 ultimate attainment level or were still in a (very late) developmental stage of their L2 acquisition.

McDonald (2006) provided evidence for the hypothesis that L2 processing resembles L1 processing under extra workload. In her research she used auditory Grammaticality Judgement Tasks, where it was confirmed that L2 preformance at ceiling level under stress-free conditions, mirrored L1 performance of the same task under increased task demands (induced by a white noise mask). This indicates that highly proficient L2 learners may not lack L2 knowledge or possess grammatical deficits, but that they process the language similarly to native speakers under stress. So L2 processing could be the result of less efficient information integration capacities and limitations on resources or resource allocation. Hopp (2010) investigated this by examining how advanced-to-near-native L2 learners of German (with Russian, Dutch and English as their native languages respectively) process German inflection and found similar results to McDonald (2006). In a speeded Grammaticality Judgement Task on German case inflections subjected to these near-native speakers of German and native speakers of German, Hopp found that the performance of the near-native speakers resembled that of the native speakers when the presentation pace of

sentences to be judged was significantly increased for the latter group (more details on this experiment can be found in the section on interfaces below). So, like McDonald (2006), the results of these experiments showed that L2 performance resembled L1 performance under considerable stress load, and its explanation points towards a computational limitation rather than a grammatical deficit. According to Hopp (2010: 921) "[p]rocessing case inflection may be comparatively less efficient in the L2 than in the L1, unless the same types of inflections are processed in both L1 and L2." So, this does not entail that there are always fundamental differences between grammatical representations of the L2 learners and native speakers, but that there could be a greater computational strain in processing the language by the former group. Hopp argued as well that late second language learners can indeed attain a native-like grammar at their L2 end stage, but that any non-native-like performance of these L2 learners is to be attributed to less efficient processing as a consequence of L1 influence. This implies a dissociation between linguistic knowledge and access to that knowledge.

2.3. Language processing

There are some fundamental assumptions we can make with respect to L1 and L2 processing based on previous research. Paradis (1985) was one of the pioneers to describe a basic model of language processing. In this model (see Figure 1 below), he describes the path of language comprehension from a sound perceived by the listener until full comprehension through a.o. mnemic encoding and linguistic decoding.

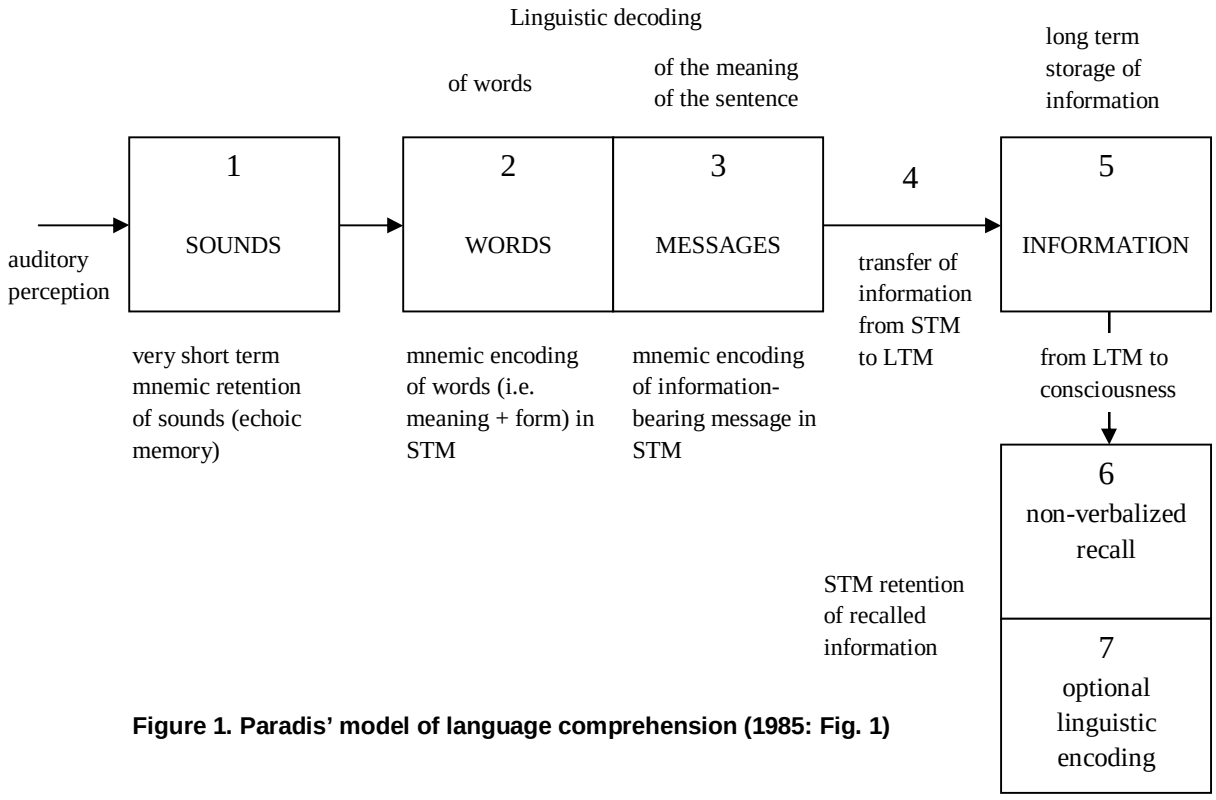


Figure 1. Paradis' model of language comprehension (1985: Fig. 1)

This model describes seven phases (numbered in Figure 1). Phase 1 is when a linguistic utterance reaches the listener's ear and is temporarily stored as a sequence of sounds in very short term memory (*i.e. echoic memory*) for the purposes of internally repeating what just has been heard in case of misinterpretation, background noise *etc.* In phase 2 the sounds are linguistically decoded as words through the application of morphological and syntactic rules of the listener's grammar and are subsequently stored in short term memory (STM) as words (*i.e.* meaning + form). Only a limited number of words can be stored in STM dependent on the listener's memory capacities. This is one of the limiting factors in bilingual processing as word comprehension and storage in one language may trigger the same word in the other language, taking up more time to process word storage. In the third phase the sequence of words are stringed together to convey a message and the meaning of this message is stored in STM. So the listener is no longer relying on the form of individual words but on the general message. This information is then transferred from short term memory to long term memory (LTM) in the fourth phase. In the fifth phase this newly attained information interacts with previously gained knowledge (*e.g.* discourse, world knowledge) and is stored in long term cognitive memory. The retrieval of this information takes place in phase 6, and can optionally be verbalized in phase 7. The verbal production of the recalled information is likely to be different in form from the initial input in phase 1, but the meaning will be similar (unless it was misinterpreted).

Now, this brings us to the processing mechanism of language production. Levelt's (1989) speaking model is the most extensive and empirically sound model of language production based on earlier proposals by Garrett (1975), Dell (1986) and Kempen & Hoenkamp (1987), and has proved to be pivotal for all production models after that. In addition, it has served as a model for certain bilingual production models as well (de Bot 1992; Poulisse & Bongaerts 1994), which will be discussed after Levelt's model. Figure 2 below is a concise diagram of Levelt's *steady-state* model (1989: Fig. 1.1), in other words it does not aim to account for language learning.

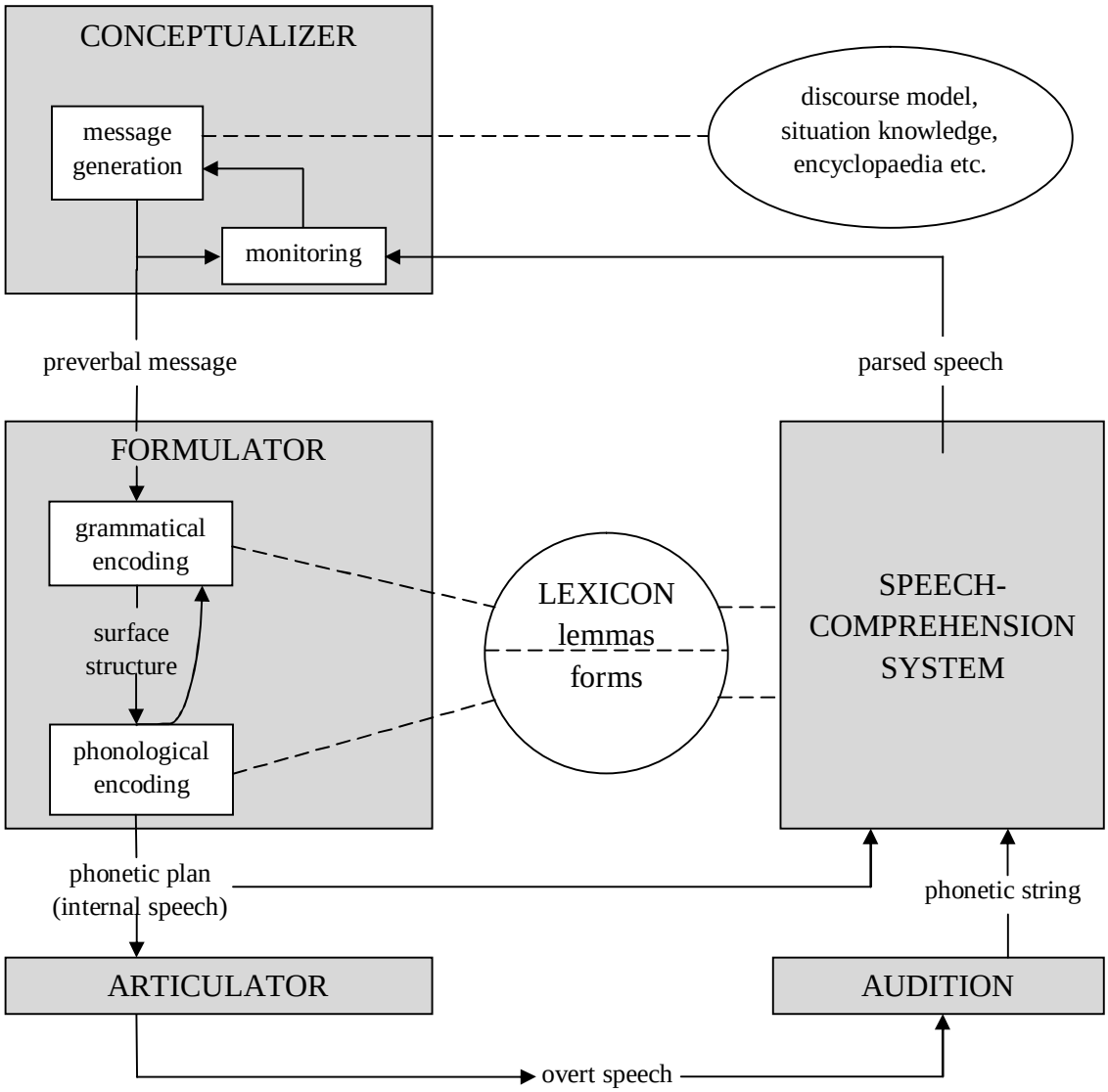


Figure 2. Levelt's speech production model (1989: Fig. 1.1)

In this model the grey boxes convey production components, the white boxes processing subcomponents, and the ellipses storage components. In the *conceptualizer* 'preverbal messages' are generated, *i.e.* the speaker selects and orders information in such a way that he/she knows what this message is going to convey without actually materialising it in linguistic subcomponents. So the focus is on meaning, not form (cf. phase 3 in Paradis' model). In planning these preverbal messages two stages are distinguished: *microplanning* and *macroplanning*. According to Levelt (1989: 5) microplanning is "the speaker's elaboration of a communicative intention by selecting the information whose expression may

realize the communicative goals," whereas macroplanning involves the retrieval of information to express this.

Then there is a *formulator* which converts the preverbal messages generated in the conceptualizer into a speech plan (*phonetic plan*) by applying (morpho)syntactic rules (*grammatical encoding*) and phonetic rules (*phonological encoding*) to the preverbal message in order to form the right words that make up the message. In doing so lexical units are retrieved from the lexicon, these units consist of lemmas and forms (or lexemes): the lemma (containing the lexical entry's meaning and syntax) is fed and processed in the grammatical encoding component and the lexeme (containing the lexical entry's morphological and phonological properties) in the phonological encoding component of the formulator. The semantic information in the preverbal message is matched up with the lemma(s) in order to select and activate the lexical item(s), the output of this process is called *surface structure*. Then the morpho-phonological properties of the lemmas active in the surface structure are activated as well. So semantic activation precedes form activation. The output is encoded as a phonetic plan.

The phonetic plan can internally be scanned by the speaker in the speech-comprehension system if they wish to do so; this so-called *internal speech* is then parsed and monitored again in the conceptualizer before it is fed back into the formulator. When the speaker is satisfied with the (newly) encoded message, the grammatically and phonologically encoded phonetic plan is then converted into *overt speech* by the articulator. So at this stage the model shows two possibilities of feedback through the speech-comprehension system: internal speech as well as overt speech can be fed back into the production system for subsequent monitoring, where in the latter case this is done through the mediation of an extra audition component.

As mentioned before, Levelt's model has been taken as the starting point for many language production models, including those accounting for bilingual processing. One of these models is Kees de Bot's (1992) bilingual production model. This model is largely similar to Levelt's model, but with a few adaptations to meet the criteria of a bilingual speaker model. These criteria are that: a) the bilinguals' language systems can be used separately and/or mixed (also known as *code-switching*), b) cross-linguistic effects have to be accounted for, c) the use of another language should not lead to decelerated production, d) the system should be able to account for imbalances, *i.e.* one language system being more dominant over the other(s), e) the model should be able to handle more than two language systems –hypothetically a potentially unlimited number of languages- and the interactions between these (see also de Bot 1992: 6). In order to meet these criteria de Bot proposed the

following adaptations to Levelt's original model: a) the conceptualizer component is partly language-specific (in the microplanning phase) and partly language-independent (in the macroplanning phase), b) there are different formulators for each language, though there is one lexicon in which the lexical items of the different languages are stored together, and c) there is only one articulator for bilinguals in which a large set of non-language specific motor plans are employed.

De Bot's bilingual production model states that in the macroplanning stage of the conceptualizer the language for generating a 'preverbal' message is selected based on the language-independent encyclopaedic knowledge, and that in the microplanning stage of the conceptualizer the language specific features associated with the selected language are triggered. For example, expressing spatial reference in English involves only selecting between *proximal* ('here') and *distal* ('there') references, whereas in Spanish one has to choose between *proximal* ('aquí'), *medial* ('ahí') and *distal* ('allí') references. So the conceptual distinctions in spatial reference between English and Spanish are selected upon language selection in the macroplanning stage, and subsequently activated in 'preverbal' message generation in the microplanning stage.

Furthermore, the bilingual production model stipulates separate formulators per language. However, the extent of 'separateness' between the formulators depends on the speaker's L2 proficiency and the linguistic distance between the L1 and L2. That is, if the speaker has just started to learn a foreign language, the words and phrases are initially stored in the L1 system. When the speaker progresses in his/her L2 acquisition, some elements – those that are not shared with the L1, *e.g.* phonemes, tones *etc.* – are transferred to separate storage components and registers, and completely balanced bilinguals process the languages separately to an even greater extent. Note that bilinguals with language pairs that are linguistically closer together than others, share more elements in a common storage/processing unit, *e.g.* a Dutch/German bilingual shares more cognates and more common syntactic features between their L1 and L2 than a Dutch/Farsi bilingual.

This brings us to the mental lexicon and whether lexical items of the L1 and L2 are all stored in one storage component or whether they are separated into two storage components. De Bot's model agrees with the former proposal and adopts Paradis' (1987) *Subset Hypothesis* to account for this: "the use of a single storage system where links between elements are strengthened through continued use" (p.11). So elements belonging to one language system form a subset, and this subset is activated in the formulator when a particular language is chosen for production in the conceptualizer. Poulisse & Bongaerts (1994) add a spreading activation explanation to this model, in which not only conceptual

information (*i.e.* the 'preverbal message') activating particular lemmas in the formulator is sent from the conceptualizer, but also an additional language feature is appended to this information so that it activates a particular lemma of that particular language. Figure 3 below shows an example of lemma selection through spreading activation.

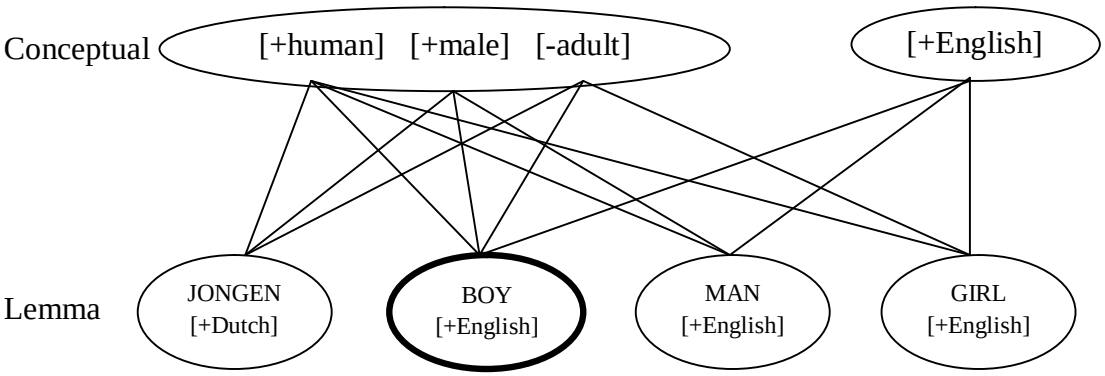


Figure 3. L2 lemma selection through spreading activation (Poulisse & Bongaert 1994: Fig. 1)

So in Poulisse & Bongaerts' (1994) model lemmas are stored in one communal mental lexicon, but are separately tagged for language. This would explain the notion of *code-switching* (unconscious switch from L1 mode to L2 mode and vice versa) as conceptual information gathered from the preverbal message as being matched to a lemma tagged with the bilinguals' other language in the formulator by mistake. De Bot's (1992) model does not allow this to happen as the language component is already *selected* before it enters the formulator by means of appending it to the preverbal message. Green (1986, 1998) suggested in his Inhibitory Control (IC) model that bilinguals cannot simply switch their languages on and off and that their languages are subject to three levels of activation:

i) *selected* language – controls the speech output;
ii) *activated* language – works parallel to selected language, involved in processing, but with no access to speech output;
iii) *dormant* language – stored in long term memory, does not play a role in ongoing processing.

The concepts of activated and dormant languages working in the background, whilst not selected by the bilinguals' *language mode*, can be tied in with research on *inhibitory control* (Green 1998) and *executive function* (Bialystok 1999, Bialystok et al. 2004, Kerr & Zelazo 2004 *inter alia*). Executive function is defined as "the psychological processes

involved in the conscious control of thought and action" (Posner & Rothbart, 2000), and inhibitory control deals with how certain cognitive tasks can consciously be inhibited to perform others. Research on this with respect to bilingualism (Bialystok 1999, Carlson & Meltzoff 2008, Martin-Rhee & Bialystok 2008 *inter alia*) confirms that bilinguals perform better in tasks calling on executive function and inhibitory control than monolinguals. In executive function tasks like the Stroop Test (Stroop 1935) or the Simon Task (Simon & Wolf 1963), bilinguals are less distracted by misleading perceptual cues and better at inhibiting certain cognitive processes in order to solve problems involving conflicting rules, performing the tasks quicker and more accurately than their monolingual peers.

A famous example of an executive function task is the Stroop Test in which participants have to name the colour a word is written in, which in its own turn spells out the name of a different colour. For instance, the word 'brown' may be written in a green colour. So the object is to name the colour ('green') rather than reading out loud the word ('brown'). During this process participants have to inhibit the 'reading process' of reading the word (*i.e.* show inhibitory control) and consciously make an effort to name the colour (*i.e.* use executive function to prioritise 'colour naming' over 'reading').

A similar task involving executive function and inhibitory control is the Simon Task. One computerised version of this task involves measuring the reaction time and response for participants who have been told to press the left SHIFT key when they see a blue square flash up on a computer screen and the right SHIFT key when they see a red square flash up on the computer screen. The squares appear in either the left or right bottom corner of the screen, either agreeing with the same side as the instructed keys (congruent trials) or on the opposite side of the instructed keys (incongruent trials). The latter calls upon inhibitory control in the participant, as they need to suppress their initial reaction of pressing down the SHIFT key that matches the position of the square on the screen. So when a blue square flashes up on the right side of the computer screen, participants may initially be inclined to press down the RIGHT shift key (corresponding with the position of the element on the screen), but in fact need to press down the LEFT shift key as the square is coloured blue (according to the instructions they have been given before the trial). When participants successfully perform the task on the incongruent trials they have consciously fought off their initial response by overruling this with the dictated response, thereby showing they mastered dealing with conflicting cognitive processes by allowing executive function to trigger the appropriate course of action.

Research confirms that bilingual children are better at executing inhibitory control in executive tasks than monolingual children (Bialystok 2001, Carlson & Meltzoff 2008,

Martin-Rhee & Bialystok 2008 *inter alia*), *i.e.* they perform the tasks quicker and more accurately, conforming to the rules prescribed to them. In the literature (Bialystok 1999, Bialystok et al. 2004 *inter alia*) this is known as executive control. The explanation for why bilingual children are better at ignoring misleading perceptual cues than monolingual children stems from the belief that bilingual children have to suppress one of their two languages when conversing or listening, *i.e.* inhibiting one language from interfering with the other in real-time. As this is constantly trained when children are speaking or listening in one of their languages, they become better at executive control and therefore perform better in executive function tasks like the Stroop test or the Simon Task. According to Bialystok (2001) the assumption is that the constant management of two competing languages enhances executive functions.

One explanation of how exactly the bilinguals' languages compete with one another can be found in Truscott & Sharwood Smith's (2004, 2011) *Modular On-line Growth and Use of Language* (MOGUL) platform, which encompasses quasi-autonomous modules similarly proposed to those by Jackendoff (1987, 2002). In this framework they propose that each item (in *e.g.* syntactic, lexical, phonological, conceptual memory) is part of a chain and linked through interfaces. The items in these chains possess certain resting levels (or activation thresholds), which can all differ among themselves and relative to one another: items will have high resting levels (meaning low activation thresholds) when they are frequently selected, or low resting levels (high activation thresholds) when they are not.

Chains are formed during on-line processing when items are activated to a sufficient degree to rise from their current resting level and enter working memory where selection can take place. Thus, in processing, the chain is (re)created in the various working memories. Note that when items are not activated they are not strictly speaking in 'chains' although the way they have come to be stored will mean the interface will match up items using their current indices, or by creating new indices to make sense of unfamiliar input.

Resting levels of items may change over time, *e.g.* bilinguals who move to a country where they speak a different language than their dominant one may choose to use the latter language less often in communication. As a result, items in their previously dominant language will be selected less often in production and comprehension, thereby lowering the resting levels of the items in this language. This could be an explanation for language attrition in some language users who do not have the resources to keep on practising their dominant/native tongue.

In MOGUL at least one item in the chain is indexed for language (L1, L2 *etc.*).[2] So when one item in the chain is activated (*e.g.* 'sleep'), this activates the rest of the chain as well, resulting in individual items competing for selection (*e.g.* 'sleeps', 'slept', 'sleeping'), as well as other chains competing with the initially activated chain (*e.g.* L2, L3 *etc.* chain). So when a concept like SLEEP is activated, this will activate the 'sleep' chain (conceptual node linked to syntactic node linked to phonological node *etc.* through interfaces; see Figure 4) but will also activate the 'slapen' chain (L2) and 'schlafen' chain (L3) in an English/Dutch/German trilingual. Now, the resting levels of these separate chains will determine which chain is to be selected for production or comprehension. That is, when competing over which item/chain is to be selected for output, the one with the highest activation level wins and thus may contribute to code-switching.

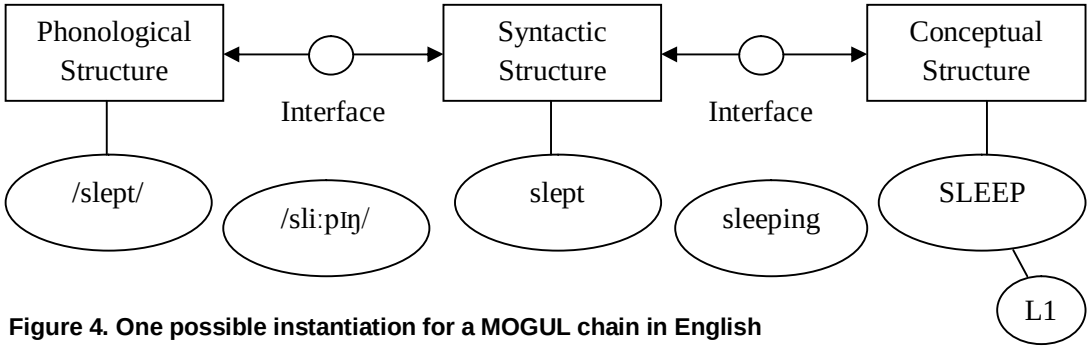


Figure 4. One possible instantiation for a MOGUL chain in English
Adapted from Truscott & Sharwood Smith (2011)

So code-switching in bilinguals and highly advanced L2 learners can be explained through different mechanisms depending on the framework or model one adopts. In Poulisse & Bongaerts' model code-switching is a lexical substitution error, whereas in de Bot's model it is an unintentional switch between the *activated* language and the *selected* language. In Green's Inhibitory Control model it is the failure of inhibiting the components of one language from interfering with the other. In Truscott & Sharwood Smith's MOGUL platform it is the result of resting levels being higher of certain (lexical) items than their equivalents in the other language.

[2] In more recent models of MOGUL language indexing is not strictly necessary in the Phonological Structure (PS) or Syntactic Structure (SS) module. That is, the PS or SS modules do not necessarily know which items are L1, L2 *etc*, though the Conceptual Structure (CS) module does.

2.4. Interfaces

Other instances of L1 interference in L2 processing occur at so-called *interfaces*. Interfaces can be defined as the interdependency and interrelationship of syntax and another cognitive domain (*e.g.* lexicon, discourse *etc.*), or in the words of Sorace (2011: 9) "syntactic structures that are sensitive to conditions of varying nature: the meaning of the term therefore denotes the fact that these conditions have to be satisfied in order for the structure to be grammatical and/or felicitous." Recent research on near-nativeness has focussed particularly on interfaces between syntax and other cognitive domains like pragmatics (Serratrice, Sorace & Paoli 2004, Pacheco & Flynn 2006 *inter alia*), discourse (Hopp 2009 *inter alia*) and morphology (Hopp 2010) at the L2 end state, where it is conjectured that near-native speakers of an L2 are capable of attaining native-like grammatical representations in narrow L2 syntax, but may still display (un)systematic L1 effects in the form of *residual indeterminacy* at the interfaces mentioned (this is known as the *Interface Hypothesis*; Sorace & Filiaci 2006). This indeterminacy, or *optionality* (Sorace 2000, 2006), can best be explained by means of an example: in Italian both preverbal (a) and postverbal (b) subjects are possible, though the latter is preferred when answering an all-focus question like (8) below.

8) Che cosa è successo? 'What happened?'
   a) **Gianni** è partito. 'Gianni is left.'
   b) È partito **Gianni**. 'Is left Gianni.' (NS preference)

(Sorace 2006: 113)

However, English near-native speakers of Italian might display optionality between the (a) and (b) constructions when answering a question like (8) in Italian. This means there is a chance distribution between answers with either a preverbal subject or postverbal subject in near-native L2 learners' production. An explanation for this is that English canonical SVO word order from the L1 could lead them to accept sentence (b) on more occasions than it would for native speakers of Italian. Note that it is not ungrammatical to have a preverbal subject in such contexts, but that it is dispreferred. So a general definition for optionality is that for a certain linguistic structure L2 learners possess a minimal pair or range of options between alternative linguistic structures, whereas L1 speakers only have a single linguistic structure preference available to them.

The phenomenon of L1 effects at the interface between syntax and another cognitive domain is predicted by the Interface Hypothesis and its ramifications are best summarised in

the words of Sorace & Filiaci (2006: 340): "narrow syntactic properties are completely acquirable in a second language, even though they may exhibit significant developmental delays, whereas interface properties involving syntax and another cognitive domain may not be fully acquirable."

Sorace & Filiaci's (2006) study on anaphora resolution in Italian targeted differences in underlying grammatical representations at the syntax-pragmatics interface between English near-native speakers of Italian and native speakers of Italian. In this study near-native and native speakers of Italian were confronted with *intrasentential anaphora* (*i.e.* references in the middle of a sentence) in Italian by means of a Picture Verification Task. The experimental stimuli consisted of complex sentences containing a main clause and a subordinate clause, in which the latter had either a null subject pronoun or an overt pronoun. Sentences with forward anaphora –where the main clause precedes the subordinate clause– (9) and backward anophora –where the main clause follows the subordinate clause– (10) were presented one at a time to the participants with three pictures underneath.

9) La mamma$_i$ dà un bacio alla figlia$_k$ mentre lei$_{k/l}$/*pro*$_i$ si mette il cappotto.
   the mother gives a kiss to the daughter, while she wears the coat
   'The mother kisses her daughter, while she/*pro* is wearing her coat.'
10) Mentre lei$_{k/l}$/*pro*$_i$ si mette il cappotto, la mamma$_i$ dà un bacio alla figlia$_k$.
   while she wears the coat, the mother gives a kiss to the daughter
   'While she/*pro* is wearing her coat, the mother kisses her daughter.'

(Sorace & Filiaci 2006: 352)

The participant then had to choose which of the three pictures matched the sentence above, so that the experimenter could establish which interpretation the participants had given to the anophora and antecedants. The results show that native speakers of Italian assign a null subject (*pro*) to the antecedent (*la mamma*) in sentences with backward anaphora (10), and that English near-native speakers of Italian allowed overt pronouns (*lei*) to refer to the antecedent (*la mamma*) as well. In general, Italian native speakers strongly dispreferred coreference between overt pronouns and the antecedent in subject position (both in backward and forward anaphora), while L2 learners allowed it significantly more often. This suggests that they have not acquired this context-dependent restriction. In sum, this study reveals that late L2 learners who have reached near-native proficiency levels in their L2 still show optionality in their L2 grammar compared to native speaker grammar. That is, native

speakers of Italian are rigorous in pronominal interpretation in their L1, but near-native speakers demonstrate a more arbitrary interpretation at the syntax-pragmatics interface.

According to the literature (Sorace & Filiaci 2006, Rankin 2009, Sorace 2011 *inter alia*), the optionality L2 learners show at inter-domain interfaces could be a result of: a) underspecification of knowledge representations (henceforth *representational account*), in which one of the bilinguals' grammars affects the other, b) a processing deficiency (henceforth *processing account*), in which processing strategies involving the integration of different types of information affect interface structures in real time, or c) insufficient access to cognitive resources (henceforth *resources account*), in which the bilingual has insufficient computational capacities to access cognitive resources in real time. However, as we saw in the introductory paragraph of this chapter there is no consensus which explanation can unambiguously account for non-convergence of interface structures at the L2 end stage, though recent research has focused increasingly more on processing accounts. Hopp (2010) in particular points into the direction of a resources account.

In one of the experiments reported by Hopp (2010), he tested near-native L2 German speakers with Dutch, English and Russian as their L1s on the processing of German case and subject-verb agreement in a speeded Grammaticality Judgement Task. Below (11) are example sentences of grammatical (a-b) and ungrammatical (c-f) conditions that were presented to the L2 learners, in which NOM indicates nominative case marking of subject S, ACC indicates accusative case marking of object O, and PL indicates incorrect plural verb disagreement with the singular subject.

11) a) *Er glaubt, dass **der** Förster im vorigen Jahr **den** Angler umgebracht hat.* (SO)
He believes that the$_{NOM}$ forester in previous year the$_{ACC}$ fisherman killed has.
b) *Er glaubt, dass **den** Förster im vorigen Jahr **der** Angler umgebracht hat.* (OS)
He believes that the$_{ACC}$ forester in previous year the$_{NOM}$ fisherman killed has.
c) **Er glaubt, dass **der** Förster im vorigen Jahr **der** Angler umgebracht hat.* (SS)
He believes that the$_{NOM}$ forester in previous year the$_{NOM}$ fisherman killed has.
d) **Er glaubt, dass **den** Förster im vorigen Jahr **den** Angler umgebracht hat.* (OO)
He believes that the$_{ACC}$ forester in previous year the$_{ACC}$ fisherman killed has.
e) **Er glaubt, dass **der** Förster im vorigen Jahr **den** Angler umgebracht **haben**.* (PL)
He believes that the$_{NOM}$ forester in previous year the$_{ACC}$ fisherman killed have.
f) **Er glaubt, dass **den** Förster im vorigen Jahr **der** Angler umgebracht **haben**.* (PL)
He believes that the$_{ACC}$ forester in previous year the$_{NOM}$ fisherman killed have.

(Hopp 2010: 919)

The results revealed that L1 English and L1 Dutch near-native speakers of L2 German did not detect ungrammatical case markings at above-chance levels when put under considerable time constraints, whereas the L1 Russian near-native speakers of German did. This can be attributed to the typological similarities between Russian and German, both case rich languages, and the differences between German and Dutch/English, both case poor languages. All L2 learners were able to distinguish ungrammatical subject-verb agreement violations; a feature that is present in all native languages of the L2 learners tested. However, Hopp insists on an explanation concerning computational limitations of the near-natives when processing the L2 under time constraints, and not on an account in which incomplete L2 grammars or grammatical deficits are the main cause for non-convergence in performance compared to native speakers of German. The rationale behind this is that in another offline Grammaticality Judgement Task, the same near-natives performed native-like with respect to case markings at the syntax-morphology interface. Further evidence for a computational deficiency was adduced when native speakers of German were subjected to the same speeded Grammaticality Judgement Task and the results revealed that correct native speaker judgements of case violations proved to be at chance level as well when the task demands were systematically increased (*i.e.* presentation of sentences to be judged speeded up).

In the last decade more questions than answers have arisen with respect to different accounts explaining interface phenomena (Sorace 2011 *inter alia*). In the case of processing and resources accounts, questions such as: i) whether a continuous stream of updating context-dependent syntax is solely responsible for insufficient processing resources at the external interfaces (*i.e.* syntax-discourse) than at the internal interfaces (*i.e.* syntax-semantics), ii) whether there is a difference in processing load and processing strategies between different kinds of interfaces (*e.g.* syntax-discourse vs syntax-lexicon interface), iii) whether optionality in interface structure realisations can be attributed to the unsuccessful integration of information in real-time and/or to resource misallocation, and iv) whether optionality in interface structure realisations is restricted to L2 processing or can also be primed in L1 processing. Even broader more abstract questions are still very much left open to debate: v) what exactly defines an interface (see Sorace 2011 and commentaries), and vi) can grammatical knowledge become grammaticalised in the sense that it becomes less dependent on external conditions, *i.e.* grammatical knowledge becoming engrained to the extent that language production becomes less context dependent and therefore language users less affected by time pressure effects and limited cognitive resource access?

As illustrated in the literature review above, most recent studies on interface structures at the L2 end stage have extensively examined the syntax-pragmatics (Sorace & Filiaci 2006 *inter alia*) and syntax-morphology (Hopp 2010 *inter alia*) interfaces, but not to the same extent structures occurring at the syntax-lexicon interface (with the possible exception of an early study by Sorace in 1993). In simple terms, the syntax-lexicon interface deals with how the choice of a particular word or word category and its properties influence the syntax of the sentence. This study aims to fill that gap by investigating the cause of (un)systematic L1 effects at the syntax-lexicon interface of highly advanced to near-native L2 learners.

As already briefly mentioned in Chapter 1, highly advanced and near-native Dutch speakers of English can be found in abundance in the Netherlands. Dutch and English are typologically close and the Dutch have many resources at their disposal to acquire English as an L2 to a highly proficient level. These factors all contribute to a large pool of near-native speakers. So the reason for examining Dutch learners of English in a study on near-nativeness is practically motivated, as it is relatively easy to find sufficient highly advanced to near-native learners of English compared to other language learners. The Dutch are known for their high proficiency in English as a second language, and thus make perfect candidates for investigating near-nativeness. One would expect near-native Dutch learners of English to have good command of English when they have enough time and resources to monitor their output (see definition of *offline task* in the previous chapter). Before going into too much detail about the particular interface structures we wish to target, we first present the general research questions this thesis deals with.

2.5. General research questions

This study aims to answer the following broad research questions:

1) What is the exact difference between near-nativeness and nativeness?
2) Are there any (lexico-)syntactic structures in the L2 end state of highly advanced to near-native learners that are divergent from the L1 grammar, *i.e.* is there evidence for an underspecification of knowledge representations among adult near-native L2 learners?
3) Are there significant differences in the ability to integrate information of the lexicon and syntax in real-time between highly advanced to near-native L2 and L1 speakers, *i.e.* is there evidence for a divergent processing strategy or a processing deficiency among adult near-native L2 learners?

4) Are there significant differences in real-time access to cognitive resources dealing with specific (lexico-)syntactic structures between highly advanced to near-native L2 and L1 speakers, *i.e.* is there evidence for reduced or no accessibility to cognitive resources among adult near-native L2 learners?

These questions are tackled by breaking them down into more specific research questions with respect to specific linguistic structures testing for interface phenomena at the syntax-lexicon interface of advanced to near-native Dutch learners of English. We will discuss these structures and their relevant characteristics, and why these structures make suitable candidates for testing near-nativeness at the syntax-lexicon interface, in the section below.

Section 2: Relevant characteristics of possessives and V2 in Dutch and English

There are certain salient and less salient differences between Dutch and English. This study focuses on these differences by investigating different structures related to word order at the syntax-lexicon interface in offline and online L2 comprehension and production. Since *offline* L2 comprehension of very advanced to near-native Dutch learners of English is expected to be native-like due to their high proficiency and knowledge of L2 syntax, it is necessary to test these learners on their *online* L2 production too when L2 learners do not possess sufficient time and resources to monitor their L2 output (see definition *online task* in the previous chapter). In other words, highly advanced to near-native Dutch L2 learners of English may show linguistic knowledge of certain lexical-syntactic constraints in offline L2 comprehension tasks, but the question is whether they have real-time access to this knowledge whilst performing online L2 production tasks, and thereby display native-like performance or not. So the offline and online tasks should make clear whether there is a difference between competence and performance in L2 English between highly advanced and near-native Dutch learners of English, and how they compare to native speakers of English. The general question here is: how near-native are near-native speakers?

As we saw in the discussion of Sorace & Filiaci's (2006) study, L1 interference may seep through in L2 syntax at certain interfaces. When this happens in offline tasks, this would then indicate underrepresentation of grammatical knowledge and in online tasks it would either indicate grammatical underrepresentation, a processing deficit (*i.e.* a deficit or deviance in integrating grammatical knowledge of syntax and the lexicon in real-time), or reduced to no access to cognitive resources (such as working memory) in real-time. Differences in online production between L1 and L2 speakers could arise when L2 learners do not have instant access to (meta)linguistic L2 knowledge. As the discussion of

McDonald's (2006) and Hopp's (2010) studies above shows, L1 speakers' correct grammaticality judgements drop down to chance level when put under significant pressure (*e.g.* through noise and time constraints). This means that somehow the extra workload prevents L1 speakers from accessing linguistic knowledge in a timely manner. This is even more applicable to L2 speakers: in de Bot's bilingual production model the speech-comprehension system can no longer monitor the phonetic plan (the link between the formulator and the speech-comprehension system is no longer accessible under increased workload), and in Paradis' comprehension model the transfer of the linguistically decoded message from short term memory to long term storage of information (phase 4) is no longer possible as short term memory is overloaded by the increased workload.

In sum, in so-called offline tasks there are ample resources (*i.e.* time, memory) for the L2 learner to access and apply (meta)linguistic knowledge, but when put under pressure it is hypothesised that L2 learners' accessibility to this knowledge deteriorates or is not even available at all. Online tasks are testing real-time access to linguistic knowledge by applying pressure through *e.g.* imposing time or memory constraints. The next chapter on methodology details how exactly these constraints are implemented in specific online tasks. For now it is important to note that induced stress of online tasks could act as a catalyst in L1 interference as the language processor/parser breaks down under time and memory stress. As a result this leads to unavailable L2 resources and so advanced/near-native Dutch learners of English revert to the L1 grammar in these circumstances. This is mirrored in Green's (1986) notion of activation level of a language in the bilingual's language system and also in de Bot's (1992) bilingual production model; where the language mode is set to the bilingual's L2 due to the specific task at hand, but a switch from the *active* language (L2) to the *selected* language (L1) takes place under stressed conditions. As a result, the language that plays a role in ongoing processes but without access to speech output is suddenly activated and selected as the *selected* language, so speech output may contain elements of the L1.

The particular linguistic structures targeting L2 learners' competence and performance at the syntax-lexicon interface are discussed in detail in the next sections. These are possessive constructions and V2 phenomena, including their exceptional occurrences in Dutch and English, and are illustrated by many examples.

2.6. Possessive structures

There exist many different grammatical constructions to convey the same relationship between entities. One of these constructions is the possessive structure, or genitive, which in English can be constructed prenominally or postnominally. A prenominally constructed genitive, or so-called prenominal genitive, means that the possessor NP and genitival marker *'s* precedes the possessum NP (12), whereas in a postnominally constructed genitive, or postnominal genitive, the possessor NP follows the possessum NP and genitival marker *of* (13). These constructions are also referred to as *s*-genitives and *of*-genitives respectively. The English examples below are glossed with Dutch equivalents for reasons that will soon become clear.

12) English: John's house

    Dutch: *'Jans huis' / 'Jan z'n huis'*[3]

13) English: The fumes of a car

    Dutch: *'De uitlaatgassen van een auto'*

The genitive is a relatively simple linguistic structure in both Dutch and English, but with slightly different lexical-semantic constraints on how and in which form to use it. The crosslinguistic differences in these constraints are the reason why this particular linguistic structure is an ideal candidate for testing optionality in word order at the syntax-lexicon interface. Using different genitive realisations in different contexts in both languages might not inadvertently lead to ungrammaticalities, but may lead to strongly dispreferred linguistic structures. For example, the English NP "the bike of David" is not absolutely ungrammatical, but is certainly less preferred than "David's bike". In Dutch, both "*Davids fiets*" ('David's bike') and "*de fiets van David*" ('the bike of David') are grammatical with no clear preference for one structure over the other. These examples show that the realisation of genitive type is highly context-dependent. In English, genitives are mostly semantically conditioned by possessor animacy, *i.e.* when the possessor is animate a prenominal genitive (*e.g. "David's bike"*) is called for. However, in Dutch, animate possessors may *also* appear in postnominal *of*-genitives (*e.g. "de fiets van David", 'the bike of David'*). In English the *s*-genitive is normally adopted when there is an animate possessor involved, leaving the *of*-

[3] The Dutch possessive pronoun *zijn* ('his') can be abbreviated to *z'n* (more often in spoken language). The same goes for *mijn* and *m'n* (both meaning 'my'). *Z'n* is used as an alternative genitive construction with male possessors, *e.g. Jan z'n fiets* ('Jan his bike'), and *haar* with female possessors, *e.g. Carla haar fiets* ('Carla her bike'). This alternative genitive construction is prenominal just like the *s*-genitive. Therefore, it can be conflated with the *s*-genitive and categorised under one category, *i.e.* prenominal genitive. This makes it more balanced and suitable for cross-linguistic analyses as the number of conditions in both Dutch and English are the same.

genitive for constructions involving inanimate possessors (though, for a more detailed description, see below).

According to Rosenbach (2008) the interaction between animacy and topicality/definiteness of the possessor and the prototypical weight of the relationship between possessor and possessum largely determines which genitive to adopt in English. Here a prototypical possessive relation [+proto] entails a close relationship between possessor and possessum (*e.g.* kinship, body parts, permanent/legal ownership), whereas a less prototypical possessive relation [-proto] entails a more loose relationship (*e.g.* temporary/associative ownership). Apart from the binary prototypical weight (14), the factors animacy (15) and definiteness (16) show graded values (Rosenbach 2008:153,164). In general, possessors high on all scales (*i.e.* on the left) show a preference for appearing inside a prenominal genitive, while possessors low on all scales (*i.e.* on the right) prefer to be within a postnominal genitive.

14) prototypical possessive relation>non-prototypical possessive relation

15) human N>animal N>collective N>temporal N>locative N>inanimate N

16) pronoun>proper noun>definite>indefinite>non-specific

s-genitive ◄——————————————————► *of*-genitive

The human and animal nouns on Rosenbach's animacy scale (15) can be even further subcategorised according to Quirk et al.'s (1972) *Gender Scale* (17).

17) human male and female (*uncle, aunt*) > human dual (*doctor*) > human common (*baby*) > human collective (*family*) > higher animals (*bull, cow*) > higher organisms (*ship*) > lower animals (*ant*)

s-genitive ◄——————————————————► *of*-genitive

s-genitive ↕ *of*-genitive

According to O'Connor et al. (2011) constituent weight and discourse status also play a large role in genitive selection. That is, heavy possessors (> 2 words) and light possessums (< 2 words) are more likely to be incorporated in a postnominal genitive, *e.g.* "the son of the well-known politician whose death was announced the other day" (Jespersen 1964: 143), and light possessors (< 2 words) and heavy possessums (> 2 words) in a prenominal genitive, *e.g.* "Scotland's number one science fiction writer Ian Banks". As for

discourse status, Hinrichs & Szmrecsanyi (2007) showed there is a clear preference for genitive constructions presenting old information before new information (also known as the "old-before-new principle"). For example, proper nouns and pronouns –usually associated with discourse-old entities– are more likely to occur in an initial position *i.e.* as a possessor in a prenominal genitive, *e.g.* "John's bike", "his house" *etc*.

Cross-linguistically, the difference lies in the different cut-off points that determine where the interacting factors realise an *s*-genitive or an *of*-genitive. In English, the cut-off point is quite liberal, since it is possible –though marginally– to construct *s*-genitives with indefinite articles followed by inanimate possessors and inanimate possessums, *e.g.* "?a car's fumes" (Rosenbach 2008:166), or to have *of*-genitives starting with definite articles followed by animate possessums and animate possessors, *e.g.* "?the sister of the doctor" (Gramacy 2006:13). In Dutch, the cut-off point is also liberal but slightly skewed towards the opposite direction. Prenominal *s*-genitives with indefinite articles and inanimate possessors/possessums such as: **een auto's uitlaatgassen* ('?a car's fumes') or **een huis z'n dak* ('?a house's roof') are ungrammatical. In contrast, in Dutch it is possible to create a postnominal genitive from an animate (human) possessor and inanimate possessum, *e.g. het huis van de man* ('?the house of the man'), or even with a proper noun as animate human possessor, *e.g. het huis van Jan* ('*?the house of John'). Furthermore, *of*-genitives with an animate possessum and animate (proper noun) possessor are common in Dutch, *e.g. de zus van de dokter* (*cf.* '?the sister of the doctor'), or *de zus van Jan* ('?the sister of John').

A corpus-based study on interchangeable genitive constructions in Dutch by van Bergen (2009) confirms that there is an overall preference for postnominal genitives in spoken Dutch, implying *of*-genitives to be the default genitive construction in spoken Dutch. A quantitative analysis of a sample of 4388 possessive constructions from the largest Dutch spoken corpus *Corpus Gesproken Nederlands* (CGN) shows that 3082 of these possessive constructions were *of*-genitives (approximately 75%). The data included in this corpus was taken from many different sources, including spontaneous vs prepared speech, informal vs formal speech, monologues vs dialogues and speech from different geographical locations. Factors taken into consideration were possessor animacy, possessor definiteness/topicality, final sibilant of possessor, prototypicality of relation, constituent length, language external factors, economy-related factors and time. A binary logistic regression analysis pointed out that inanimate possessors, monologues, prepared speech and non-prototypical relations are strong predictors for postnominal genitives ($p<.001$), whereas informal language and possessum length are strong predictors for prenominal genitives ($p<.001$ & $p<.05$ respectively).

So, both Dutch and English show optionality between *s*-genitive and *of*-genitive usage, but depending on the lexical and pragmatic context (*e.g.* animacy, definiteness, weight), one of the two structures might be preferred over the other. The differences between English and Dutch genitive variation are illustrated in Tables 1 and 2 below (see constructions in bold in both tables). These tables show a considerable difference in optionality of genitive constructions between the two languages. The most salient difference concerns genitives with so-called temporal and locative nouns. For example, both English and Dutch show optionality in locative genitives: 'London's suburbs' / 'the suburbs of London' and *Londens voorsteden / de voorsteden van Londen*, where in English the former construction is preferred and in Dutch the latter.

A more salient difference is the absence of optionality in temporal genitives in Dutch, *i.e.* only *of*-genitives are permitted with temporal possessors. For example, English *s*-genitives like 'yesterday's weather', 'Wednesday's meeting', 'today's newspaper' can only be translated in Dutch as *het weer van gisteren* ('the weather of yesterday'), *de vergadering van woensdag* ('the meeting of Wednesday'), *de krant van vandaag* ('the newspaper of today') respectively and ***not*** as **gisterens weer*, **woensdags vergadering*, **vandaags krant*. Another cross-linguistic difference concerns genitives with an indefinite article, a human possessor and an inanimate possessum, *i.e.* an English *s*-genitive like 'a girl's face' can only be translated with a Dutch *of*-genitive such as *een gezicht van een meisje* ('a face of a girl'), or by adopting a compound like *een meisjesgezicht* ('a girl face'). The same is true for most indefinite/non-specific genitives in Dutch (see bottom row of Table 2). So Dutch possessive structures consist of similar constructions (*s/of*-genitives) like in English, but are adopted under slightly different circumstances. This difference, and the fact there's more optionality between Dutch possessive structures, creates a precedent for non-convergent L2 English structures that can be tested. That is, Dutch L2 learners of English could adopt different possessive structures (*e.g.* an *of*-genitive instead of an *s*-genitive) than native speakers of English under the same test conditions.

Table 1. English genitive variation

	Human N	**Animal N**	**Collective N**	**Temporal N**	**Locative N**	**Inanimate N**
Pronoun	[+proto]: *my face* [-proto]: *my wealth*	[+proto]: *its paws* [-proto]: *its food*	[+proto]: *our hands* [-proto]: *our education*	-	[+proto]: - [-proto]: *their's*	[+proto]: *its shelf* [-proto]: *its productivity / productivity of it*
Proper noun	[+proto]: *John's face* [-proto]: *John's wealth*	[+proto]: *Timmy's paws* [-proto]: *Timmy's food*	[+proto]: *Tesco's shops /? the shops of Tesco* [-proto]: *Tesco's deals / ?the deals of Tesco*	[+proto]: *January's darkness / the darkness of January* [-proto]: ***Wednesday's meeting** / the meeting of Wednesday*	[+proto]: ***London's suburbs** / the suburbs of London* [-proto]: *Edinburgh's train station / the train station of Edinburgh*	[+proto]: *the Eiffel Tower's peak / the peak of the Eiffel Tower* [-proto]: *WWII's horrors / the horrors of WWII*
Definite	[+proto]: *the boy's eyes* [-proto]: *the mother's future*	[+proto]: *the cat's tail / the tail of the cat* [-proto]: *the dog's master / the master of the dog*	[+proto]: *the company's product / the product of the company* [-proto]: *the government's policy / the policy of the government*	[+proto]: *?the hour's quarter / the quarter of an hour* [-proto]: ***the minute's rest** /? the rest of a minute*	-	[+proto]: *the building's entrance / the entrance of the building* [-proto]: *?the car's price / the price of the car*
Indefinite	[+proto]: *a girl's face / ?a face of a girl* [-proto]: *a woman's shadow /? a shadow of a woman*	[+proto]: *a bird's feather / a feather of a bird* [-proto]: *an elephant's environment / an environment of an elephant*	[+proto]: *a company's product / a product of a company* [-proto]: *a government's policy / ?a policy of a government*	[+proto]: *?an hour's quarter / a quarter of an hour* [-proto]: *a minute's rest /? a rest of a minute*	-	[+proto]: *a building's entrance / an entrance of a building* [-proto]: *?a car's price / a price of a car*
Non-specific*	[+proto]: *girls' eyes / eyes of girls* [-proto]: *girls' dreams / dreams of girls*	[+proto]: *rats' tails / tails of rats* [-proto]: *bats' diseases / diseases of bats*	[+proto]: *?company's director / director of a company* [-proto]: *?council's resolution / resolution of the council*	[+proto]: *moment's time* [-proto]: *yesterday's weather*	-	[+proto]: *?book's title / title of a book* [-proto]: *?computer's screen / screen of a computer*

* Note that many non-specific genitives can be replaced by compounds, *e.g. computer screen.*

Table 2. Dutch genitive variation (translation equivalent of Table 1)

	Human N	**Animal N**	**Collective N**	**Temporal N**	**Locative N**	**Inanimate N**
Pronoun	[+proto]: *mijn gezicht / m'n gezicht* [-proto]: *mijn rijkdom / m'n rijkdom*	[+proto]: *zijn poten / z'n poten* [-proto]: *zijn eten / z'n eten*	[+proto]: *onze handen* [-proto]: *ons onderwijs*	-	-	-
Proper noun	[+proto]: *Jans gezicht / **het gezicht van Jan*** [-proto]: *Jans rijkdom / **de rijkdom van Jan***	[+proto]: *Timmy's poten / **de poten van Timmy*** [-proto]: *Timmy's eten / **het eten van Timmy***	[+proto]: ?*Tesco's winkels / **de winkels van Tesco*** [-proto]: ?*Tesco's aanbiedingen / **de aanbiedingen van Tesco***	[+proto]: ??*januari's donkerheid / de donkerheid van januari* [-proto]: ??*woensdag's vergadering / **de vergadering van woensdag***	[+proto]: ?*Londen's voorsteden / **de voorsteden van Londen*** [-proto]: ?*Edinburgh's station / het station van Edinburgh*	[+proto]: *?*De Eiffeltoren's spits / **de spits van de Eiffeltoren*** [-proto]: ?*WOII's gruwelen / **de gruwelen van WOII***
Definite	[+proto]: ?*de jongen z'n ogen / **de ogen van de jongen*** [-proto]: ?*de moeders toekomst / **de toekomst van de moeder***	[+proto]: ?*de kat z'n staart / **de staart van de kat*** [-proto]: ?de *hond z'n baas / **de baas van de hond***	[+proto]: ??*het bedrijf z'n produkt / het produkt van het bedrijf* [-proto]: ??*de overheid z'n beleid / het beleid van de overheid*	[+proto]: **het uur z'n kwartier / het kwartier van een uur* [-proto]: **de minuut z'n rust / **de rust van een minuut***	-	[+proto]: ??*het gebouw z'n entree / **de entree van het gebouw*** [-proto]: ??*de auto z'n prijs / de prijs van de auto*
Indefinite	[+proto]: **?een meisje haar gezicht / **een gezicht van een meisje*** [-proto]: **?een vrouw haar shaduw / een schaduw van een vrouw*	[+proto]: *?een vogel z'n veer / een veer van een vogel* [-proto]: ?*een olifant z'n omgeving / een omgeving van een olifant*	[+proto]: ??*een bedrijf z'n produkt / een produkt van een bedrijf* [-proto]: *??een overheid z'n beleid / een beleid van een overheid*	[+proto]: **een uur z'n kwartier / een kwartier van een uur* [-proto]: **een minuut z'n rust / ?een rust van een minuut*	-	[+proto]: ??*een gebouw z'n entree / een entree van een gebouw* [-proto]: ??*een auto z'n prijs / een prijs van een auto*
Non-specific**	[+proto]: *ogen van meisjes* [-proto]: *dromen van meisjes*	[+proto]: *staarten van ratten* [-proto]: *ziekten van vleermuizen*	[+proto]: *directeur van een bedrijf* [-proto]: *besluit van een gemeente*	[+proto]: - [-proto]: ***het weer van gisteren***	-	[+proto]: *titel van een boek* [-proto]: *scherm van een computer*

** Note that for almost all instances of the non-specific genitives mentioned here, Dutch prefers to adopt compounds rather than a genitive, *i.e. meisjesogen* ('girl eyes'), *meisjesdromen* ('girl dreams'), *rattenstaarten* ('rat tails'), *vleermuisziekten* ('bat diseases'), *bedrijfsdirecteur* ('company director'), *gemeentebesluit* ('council decision'), *(boek)titel* ('book title'), *computerscherm* ('computer screen').

In sum, *of*-genitives are more common in Dutch than *s*-genitives, and as a result of this elevated lexical frequency Dutch learners of English could accept an *of*-genitive in L2 English comprehension under some form of induced stress (*e.g.* through time or memory pressure) when an *s*-genitive is preferred by native speakers of English. The same goes for L2 production where an *of*-genitive could be transferred from Dutch to English in L2 production under stress. It appears the main distinguishing factor in preference differences between English and Dutch is the animacy factor: in Dutch animate possessors appear in *of*-

genitives as well as in *s*-genitives, whereas in English animate possessors are exclusively confined to *s*-genitive constructions.

2.7. V2 structures

Despite the vast typological variation of languages, linguists know that languages of the same family branch share similar properties. For example, Germanic languages show V2 word order or residual V2 in their grammar. Dutch and German notably –but Swedish and even English to a lesser extent– have a rigid V2 word order in declarative sentences or sentences starting with a non-subject constituent. While in Dutch and German the verb is always in the second position in these constructions, this may not necessarily be so in English (hence the term residual V2 when it does occur).

Robertson & Sorace (1999) investigated the transfer of V2 structures in L2 English by German/Dutch advanced learners (also V2-L1 learners of English), and discovered that V2 transfer does sometimes take place in narrow syntactic contexts among these learners. More recent studies (Rankin 2009, 2012) confirmed unlicensed residual V2 effects at the syntax-discourse/pragmatics interface. These studies were all *corpus-based* studies investigating V2 effects in narrow syntax (Robertson & Sorace 1999) or at the syntax-discourse interface (Rankin 2009, 2012) of V2-L1 learners of English. Robertson & Sorace largely looked at many variations of grammatical and ungrammatical sentences starting with a non-subject constituent followed by an auxiliary verb and the subject (18), whereas Rankin also investigated lexical verb movement past adverbs (19), negation (20), and in questions (21).

18) *In some circumstances may you smoke. (XP-V_{AUX}-Subj)
19) *He smokes often a cigarette. (V_{LEX}-Adv-Obj)
20) *He smokes not a pipe. (V_{LEX}-Neg-Obj)
21) *Smokes he often a pipe? (V_{LEX}-Subj)

Both studies confirmed that the predictions the *Interface Hypothesis* makes were borne out, though at the time of Robertson & Sorace's (1999) study the Interface Hypothesis had not been formally formulated yet. In addition, these studies only targeted written materials drawn from corpora consisting of English essays by intermediate German learners of English. As the L2 learners in these studies had access to all of their available language processing resources (sufficient time and memory resources to monitor their L2 production carefully), the data elicited can be described as being elicited under offline conditions. In

order to corroborate whether insufficient processing resources may be the cause of L2 optionality at the syntax-discourse interface, one needs to employ online tasks in empirical L2 research too, *i.e.* test near-native speakers in conditions where they are unable to monitor their L2 production carefully. Our study will exactly do that. Since V2 structures are less marked in Dutch than in English, these structures might persist in the online L2 comprehension and production of near-native Dutch learners of English, especially at the interface boundary with syntax where more processing costs are likely to be incurred. A brief literature overview regarding this phenomenon among intermediate-advanced German and Dutch learners of English follows.

Robertson & Sorace (1999) investigated a corpus of essays written in English by advanced German students of English who were in their last year of secondary school (pre-university level). Typical fabrications like (22-24) below revealed these students adopted an interlanguage (IL) grammar in which V2 structures resembling German V2 word order appeared in L2 English, though these particular structures are not permitted according to English syntax.

22) Always ***have been*** conservative warnings that the harms would outweigh the positive consequences.
23) […], for many kids ***is living*** with their parents a nightmare.
24) […], everywhere ***do*** human beings perform plays: short plays, dramas and comedy.

(Robertson & Sorace 1999: 317)

In order to further test linguistic acceptability of residual V2 by German learners of English, Robertson & Sorace adopted a Magnitude Estimation Task (Bard et al. 1996 *inter alia*). This methodology, unlike Acceptability Judgement Tasks adopting a Likert scale, provides a continuous scale on which the participant can grade their acceptability. The participants have to estimate the acceptability of a sentence compared to a base level (in this case a modulus sentence). The advantage of adopting such a methodology is that gradient phenomena such as residual V2 can be evaluated more accurately (more on this methodology in the next chapter). The structures Robertson & Sorace tested included numerous ungrammatical V2 structures in English (25-33).

25) Topicalised adverbial + finite $V_{[AUX]}$ + SUBJ + finite V
Context: *The fire regulations have recently been revised.*
In some circumstances **are guests allowed to smoke in the bedrooms.*

26) Topicalised object NP + finite $V_{[AUX]}$ + SUBJ + finite V

Context: *I've climbed a lot of mountains in my life.*

Several mountains **have I climbed as high as this one.*

27) Topicalised adverbial + unaccusative V + SUBJ (without *there*-insertion)

Context: *The traditional roles of men and women have changed.*

Recently **has taken place a revolution in the family.*

28) Topicalised object NP + $V_{[AUX]}$ + SUBJ (context favourable to topicalisation)

Context: *Which of the Thompson sisters shall I invite to the party?*

Mary Thompson **would I like to meet.*

29) Topicalised object NP + $V_{[AUX\text{-}do]}$ + SUBJ (context unfavourable to topicalisation)

Context: *Do you watch television in the evenings?*

Ice hockey **do I enjoy watching very much.*

30) Sentence-initial discourse adverbial + finite $V_{[AUX]}$ + SUBJ

Context: *I hate the smell of cigarettes.*

Because of this **have I always refused to allow smoking in my house.*

31) Sentence-initial discourse adverbial + finite $V_{[AUX\text{-}do]}$ + SUBJ

Context: *I hate the smell of cigarettes.*

Because of this **do I always refused to allow smoking in my house.*

32) Topicalised adverbial + finite copula + SUBJ

Context: *Women's emancipation is still not yet complete.*

For some women **is feminism still a dirty word.*

33) Extraposed sentential subject + finite $V_{[AUX\text{-}be]}$ + participle + *that* + SUBJ

Context: *A large study of language learning has just been published in America.*

In the study **is reported that girls are better at languages than boys.*

(Robertson & Sorace 1999: 322-323)

According to the *Interface Hypothesis* V2-L1 learners of English could produce structures like the ones above at the syntax-discourse interface, and therefore might be expected to accept these sentences in offline comprehension tasks such as Magnitude Estimation. However, very advanced/near-native Dutch learners of English are not likely to produce ungrammatical V2 in offline tasks such as writing essays, nor accept these structures in offline comprehension tasks, as they will adopt their metalinguistic knowledge of L2 English word order. However, offline acceptability judgements for certain grammatical V2 structures in English might be more divergent for advanced Dutch learners of English, as these learners may not have been exposed to –or instructed on the use of– these infrequent

structures. Robertson & Sorace tested the acceptability of two particular grammatical V2 structures in English, *viz.* negative preposing, also known as negative inversion, (34-35) and locative inversion (36), among intermediate-advanced German learners of English.

34) Preposed *negative* adverbial + finite $V_{[AUX]}$ + SUBJ + finite V
Context: *The fire regulations have recently been revised.*
*In no circumstances **are** guests allowed to smoke in the bedrooms.*
35) Preposed *negative* object NP + finite $V_{[AUX]}$ + SUBJ + finite V
Context: *I've climbed a lot of mountains in my life.*
*Only one mountain **have** I climbed as high as this one.*
36) Locative inversion: adverbial + $V_{[LEX]}$ + SUBJ
Context: *We were watching for a family of foxes we had seen the day before.*
*Out of the wood **came** a small female fox.*

Note that the bold verbs in sentences (34-35) cannot appear in V3 position due to the negation in the preposed constituent; this is called negative preposing (or negative inversion) and occurs when negative polarity items are present in preposed adverbials of manner (see section 2.7.2. on preposed adverbials for more detail). However, the bold verb in (36) may appear in V3 position when *there* is inserted between the adverbial and the lexical verb as in (37) below.

37) *Out of the wood there **came** a small female fox.*

These correct English V2 configurations make interesting test-cases for hypercorrection on the part of intermediate-advanced V2-L1 learners of English who are aware of the V2 constraint in English, but may hypercorrect grammatical V2 to V3 due to their metalinguistic awareness of English word order. Indications that this might indeed be the case are confirmed by Sorace & Robertson's results, where post-hoc Tukey tests revealed that "all non-native speaker groups except the most advanced prefer the ungrammatical V3 structure to the grammatical V2 structure." (p. 324). So advanced German learners of English did accept grammatical V2 in negative preposing and locative inversion. As Dutch is a V2 language like German and shares most of the characteristics related to word order with German, we would like to examine whether the results in the studies discussed can be replicated with advanced and near-native Dutch learners of English. In particular, we are interested to see whether advanced Dutch learners of English also prefer ungrammatical V3

over grammatical V2 in their L2 production and comprehension. That is, whether word order preferences in L2 English are carried over cross-linguistically among L1-V2 language speakers. In addition, this study will examine how judgements and productions may vary between offline and online tasks as this has not been investigated in the afore mentioned studies.

Rankin (2009) investigated residual V2 structures at the syntax-discourse interface in advanced Dutch and German learners of English (final year university students of English language and literature) from the International Corpus of Learner English (ICLE; Granger et al. 2002) in order to provide evidence that residual V2 is not a consequence of narrow V2 syntax transfer, but a deficit at the discourse-pragmatics interface. Rankin postulates that "resetting the verb movement parameter for English will be relatively straightforward, *i.e.* that lexical verbs never raise. On the other hand, mastering structures at the interfaces with discourse-pragmatics will prove persistently problematic" (p. 50). In identifying V2 structures in V2-L1 learners of English, Rankin tagged the following surface structures in subcorpora of the ICLE: V_{LEX}-Adv-Obj, V_{LEX}-Neg-Obj, XP-V-Subj. Analysing the frequencies of these surface orders revealed that learners do show residual V2 effects. For example, sentences (38)-(39) below show expletive *do*-insertion to maintain V2 order where no modal or auxiliary was available for movement:

38) **And still do they** have a very powerful army.
39) **Already then did America** see itself as a kind of global cop …

(ICLE-GE/DU 2002)

Besides expletive *do*-insertion, residual V2 also occured with *have*, *be* and other lexical verbs as sentences (40)-(42) demonstrate respectively.

40) **Only has this place** become smaller.
41) **Essential is just who decides** what we can watch and why.
42) **This excellent example of this principle, can we find** whenever two countries or nations went to war.

(ICLE-GE 2002)

Inversion of 'lexical' *have* (43), *be* (44) and a true lexical verb (45) occurred also in interrogatives, where standard British English would normally require *do*-support.

43) **Has television** as much influence on people as religion had in former days?
44) **Shouldn't be there** a speed limit on German motorways in order to avoid such photos in future?
45) **Exclude this two things** themselves mutually?

(ICLE-GE 2002)

Except for (45), all of the examples above indicate that residual V2 is largely confined to auxiliaries and copula *be* at the syntax-discourse interface, though verb-adverb-object (VAO) sequences seem to indicate that some German learners of English still permit lexical verb movement in narrow syntactic contexts. An explanation for the latter could be that it is *not* the position of the verb, but the position of the adverb that V2-L1 learners of English misplace. In V2 languages like German and Dutch, adverbs can easily be inserted between the verb and its object (46, 47 for German and Dutch respectively), whereas its English counterpart restricts adverb placement to sentence initial position where it does not break up the VP unity (48).

46) Ich spiele oft Gitarre mit meinem Freund.
47) Ik speel vaak gitaar met m'n vriend.
'I play often guitar with my friend.'
48) (Often) I (often) play guitar with my friend.

Thus, possible L1 transfer could account why an adverb is inserted between the lexical verb and its object, rather than positioning it before the verb. Second language learner productions in the ICLE confirm that V2-L1 learners of English may produce these specific V2 configurations in finite main clauses (49), main clauses with infinitives (50), finite embedded clauses (51) and embedded clauses with infinitives (52).

49) *Another man **saved** <u>always</u> a part of his earnings in order to be able to fulfil his most cherished dream.
50) *But one has **to take** <u>sensitively</u> care that nobody is hurt thereby!
51) *At 6.30 I arrived in Mark's prison cell accompanied by a warder who **closed** <u>immediately</u> the door behind us.
52) *In her egoism she is unable **to see** <u>objectively</u> where she is wrong.

(ICLE-GE 2002)

Not that rather than having a preposed non-subject XP followed by a lexical verb, the sentences above start with a subject XP, and with the lexical verb still in second place, this makes it a different type of V2 configuration.

In sum, there is some evidence to suggest that residual V2 pervades at the syntax-discourse interface of V2-L1 learners of English in their L2 comprehension and production. The evidence for this came from corpora of written materials by intermediate-advanced German learners of English. As mentioned briefly before, our study attempts to verify and replicate the findings of Robertson & Sorace (1999) and Rankin (2009, 2012) by scrutinising L2 comprehension and production of not only highly advanced Dutch learners of English but also near-native Dutch speakers of English in order to determine the effect of L2 proficiency on interface phenomena. On top of that our study ventures into cross-comparisons between offline and online data in order to determine the effect of resource accessibility on L2 comprehension and production. So this study targets (meta)linguistic L2 knowledge of English V2 constraints *and its exceptions* in offline tasks and accessibility to this knowledge in online tasks among advanced and near-native Dutch learners of English. The next two subsections deal with these exceptions, focussing specifically on preposed adverbials of location (locative inversion) and manner (negative inversion), and how they could be used as an instrument for testing near-nativeness at the syntax-lexicon interface.

2.7.1. Locative inversions

This section deals with a specific realisation of residual V2 in English, *viz.* locative inversion, in which it details the specific constraints on verbs and information structure in order to license V2 word order in English. In these 'stylistic' constructions an adverbial *locative* prepositional phrase is fronted, followed by the finite verb and a post-verbal subject as seen in (36), repeated as (53) below.

53) Out of the wood **came** a small female fox.
(Robertson & Sorace 1999: 321)

According to Coopmans (1989), the following conditions account for residual V2 in *locative inversion* in English:

a) The verb is non-thematic and cannot take a direct object (*i.e.* is intransitive);
b) The postverbal subject cannot be a pronominal (since the subject is new to the discourse);
c) The preposed non-subject constituent cannot contain a negative;
d) The fronted prepositional phrase should be an adverbial of place (*locative*), not of time, manner, instrument, reason *etc.*;
e) V2 can only occur in root clauses.

In addition to these conditions, Emonds (1976) points out that the locative inversion generally employs a non-thematic verb in the simple past/present and that auxiliaries, modals, progressive *be* and perfective *have* are less common in locative inversions. Since the verb in second position is non-thematic it cannot assign theta roles, and therefore, according to Coopmans, this means that the verb could co-occur with null expletive subjects (instantiated as '*expletive pro*' ***e***). In other words, there is no rightward movement from the subject position rather VP-internal movement (adjunction). In terms of grammatical representation, this would look like (54).

54) P_j [**e** INFL [[V NP $e_j]_{VP}$]$_{VP}$]$_S$

Evidence for such structures comes from Dutch, which Coopmans dubs a 'semi-pro-drop' language: "In Dutch it is possible to leave the subject empty if there is no external argument that needs to be projected onto that position … no external thematic (or θ-)role needs to be assigned to the subject position" (pp. 733-4). So, structures like impersonal passives, double object passives, unaccusative constructions and predicates followed by notional sentential subjects appear with so-called null expletive subjects. For example,

55) *Er werd* [**e** *gevoetbald*]$_S$.
There was played.football
56) *Op straat werd* [**e** *gevoetbald*]$_S$.
On street was played.football

As (56) shows a non-subject locative adverbial is followed by a non-thematic verb in second position in Dutch. This closely resembles the residual V2 construction under scrutiny in English except for the post-verbal subject. Note that the non-thematic verbs in these constructions lexically govern the type of fronted adverbials. That is, the verb only allows fronted locative adverbials that express direction or position (as required by the verb). A similar line of reasoning can be applied to example sentence (53). The unaccusative verb *came* in (53) does not assign a semantic agentive theta role to its syntactic subject, rather *a small female fox* is semantically similar to the direct object of a transitive verb (and thus not actively initiating action).

In addition Coopmans (1989:735-6) argues that when a locative PP is fronted it leaves a trace that should be properly governed locally, *i.e.* the trace is bound by the fronted PP in COMP in order to satisfy the Empty Category Principle (ECP):

57) Indexed COMP indentifies 'pro': $[_{i}$ PP $]_{COMP}$ pro_{i}

The formulation in (57) should be read as a topicalised PP in COMP triggering semi-pro-drop in the subject position it governs (a result of 'COMP index percolation'). So it appears in English certain unaccusative verbs allow locative prepositional phrases to be fronted in order for the unaccusative to be in second position followed by a (non-agentive) subject. However, Levin & Rappaport Hovav (1995) show that it is not only unaccusatives that may appear in locative inversion constructions, but that certain unergative verbs may appear in these constructions as well.

Generally speaking intransitive verbs of existence (*e.g.* 'exist', 'flourish', 'thrive') and appearance (*e.g.* 'appear', 'arise', 'issue') and verbs of external change of state that are 'informationally light' (*e.g.* 'come', 'hang') are possible in locative inversion constructions (see Sorace 2000b, 2004b for a discussion on split intransitivity and which verbs count as core verbs for typical unaccusativity). This section will discuss which verbs can and cannot appear in locative inversion. In contrast to general belief, not all unaccusatives may appear in locative inversion constructions. For example, unaccusatives that indicate an internally caused change of state, *e.g.* 'break', 'melt', 'dry', do not appear in locative inversions. On the other hand, verbs that indicate an externally caused change of state may appear in a locative inversion construction.

So, besides unaccusatives, unergative verbs may also appear inside locative inversions. These could be typical unergatives (*e.g.* 'chatter', 'sing', 'work', 'lounge', 'sleep', 'doze') or unergative verbs of light emission (*e.g.* 'gleam', 'glisten', 'flash',

'sparkle', 'glitter'), sound emission (*e.g.* 'tick', 'rumble') and substance emission (*e.g.* 'bubble'). The crucial condition here is that these verbs should all be 'informationally light', *i.e.* it should follow that the verb and postverbal subject do not contribute to new information. Consequently this means that verb and postverbal NP are mutually predictable, *e.g.* collocations, where semantic affinity arises when the verb describes a characteristic activity of its argument's referent such as 'clocks tick', 'bird wings flutter', 'jewels sparkle' *etc.*

The postverbal NP in a locative inversion should not be discourse-new, but could contain just 'relatively unfamiliar information'. As a result, verbs with multiple meanings in locative inversions should be disambiguated by the context so that the interpretation is 'informationally light'. For example, a verb like 'break' can only be used in a locative inversion when it denotes something of coming into existence ("the news broke") and not when it denotes a change of state ("the vase broke"). Another example is 'open', where this verb cannot appear in a locative inversion if it is 'a change-of-state-verb' ("to open a bottle") but may be included in a locative inversion as 'an appearance verb', *e.g.* "Underneath him opened a cavity with sides two hundred feet high" (E. Phillpotts, *The Red Redmaynes*, 9). This explains why *unambiguous* externally caused verbs of change of state are not found in locative inversions, as they do not possess an alternative meaning that can be interpreted as informationally light.

So in a way the discourse function restricts the set of verbs attested in locative inversions. If the discourse context demands a change-of-state-verb, this excludes a locative inversion construction from the number of possible constructions. So in a non-changing-state context the verb 'grow' may mean to 'live rootedly' and hence appear in a locative inversion, *e.g.* "in our garden grew a very hardy and pest-resistant variety of corn" (Levin & Rappaport Hovav 1995: 236). Whereas in a change-of-state context where 'grow' means 'to increase in size', this is not possible, *e.g.* "*In Alabama grows corn very slowly."

However, internally caused change-of-state-verbs in a less strict meaning of the sense can appear inside locative inversions. This is only true when this type of verb denotes a 'be of state' rather than a 'change of state'. The locative inversion "In the garden may bloom the Christmasplant …" (Levin & Rappaport Hovav 1995: 235) contains an internally caused change-of-state-verb 'bloom', but is permitted in this construction since it does not denote a change of state. The overview below summarises which types of verbs may appear in locative inversion constructions:[4]

[4] See Levin (1993:92) for a more comprehensive overview of all verbs possible in locative inversion constructions, and Sorace (2000b, 2004b) for a discussion on these core verbs with respect to auxiliary selection.

i) inherently directed motion verbs, *e.g.* ‘arrive’, ‘come’, ‘go’ *etc.*
    a. agentive verbs of manner of motion, *e.g.* ‘run’, ‘ascend’, ‘prance’, ‘fly’, ‘crawl’, ‘shuffle’, ‘swim’ *etc.*

ii) verbs of spatial configuration disambiguated to be informationally light (usually with inanimate subjects), *e.g.* ‘lie’, ‘sit’, ‘hang’, ‘stand’, ‘protrude’, ‘perch’ *etc.*

iii) verbs of manner of motion/sound/light/substance emission with directional phrase complements, *e.g.* ‘ride’, ‘stride’, ‘bound’, ‘walk’, ‘rattle’, ‘tick’, ‘gleam’, ‘bubble’ *etc.*
    a. verbs of emission that can be used in an appearance sense, *e.g.* ‘boom’ in “Out of his throat boomed the great vocal bell.” (p. 238)

iv) verbs of body-internal motion, *e.g.* ‘fidget’, ‘flap’, ‘flutter’, ‘gyrate’, ‘jiggle’, ‘pivot’, ‘rock’, ‘squirm’, ‘stir’, ‘sway’, ‘totter’, ‘twitch’, ‘wave’, ‘wiggle’, ‘wobble’, ‘wriggle’ *etc.*

v) verbs in passive construction that are
    a. verbs of putting, *e.g.* ‘display’, ‘embed’, ‘heap’, ‘locate’, ‘place’, ‘put’, ‘store’ *etc.*
    b. verbs of putting in a spatial configuration, *e.g.* ‘lay’, ‘mount’, ‘perch’, ‘seat’ *etc.*
    c. verbs of attachment, *e.g.* ‘glue’, ‘hook’, ‘lace’, ‘paste’, ‘pin’, ‘staple’ *etc.*
    d. verbs of image impression, *e.g.* ‘engrave’, ‘imprint’, ‘inscribe’, ‘scrawl’, ‘stamp’ *etc.*
    e. verbs of creation, *e.g.* ‘build’, ‘carve’, ‘cook’, ‘erect’ *etc.*
    f. verbs of perception, *e.g.* ‘discern’, ‘glimpse’, ‘hear’, ‘realise’, ‘see’ *etc.*

Based on the many constraints described and explained above, it is predicted that locative inversions containing unaccusatives (58) are judged more acceptable more often by native speakers of English than those with unergative verbs (59).

58) On stage **appeared** a rock star.
59) *On stage **sang** a rock star.

The explanation for this is that unaccusatives do not assign theta roles (cf. informationally light), and since a locative inversion starts with a non-thematic preposed locative adverbial in a non-argument (A') position there is no initial confusion on the role of the preposed adverbial. Thus, unaccusative verbs and their predicates expressing habitual non-eventive

events are generally more accepted in locative inversions than unergative verbs and their predicates expressing non-habitual eventive events (*i.e.* the latter are informationally heavy). The section on research questions poses hypotheses and predictions about expected differences between V2-L1 learners of English and native speakers of English with respect to English locative inversions, but first we will discuss another residual V2 structure in English.

2.7.2. Preposed adverbials of manner (negative inversion)

Similar to locative inversion, there is another construction involving a preposed adverbial that allows for V2 word order in English, *viz.* preposed adverbials of manner containing a negative polarity item. For example when the adverbial in (60) below is preposed, the outcome should be accompanied by subject-verb inversion in order for it to be grammatical in English (61). A single movement (adverbial fronting) is not sufficient to turn the sentence into a grammatical English construction in this particular situation (62).[5]

60) I would do that in no case.
61) In no case would I do that.
62) *In no case I would do that.

However, if the preposed adverbial of manner does not contain a negative polarity item then subject-verb inversion is not triggered and V3 rather than V2 word order is the only grammatical construction possible. From this it can be concluded that the presence of a negative element in the preposed adverbial of manner is responsible for residual V2 in this particular construction. According to Rizzi (1996:74) the inflected verb in COMP (or C^0) is endowed with a feature [+neg] in cases like (61). The explanation is that in (60) the negation is not in scope position (*i.e.* not in A' position) at Surface Structure (SS), but as soon as it is preposed it qualifies as a negative operator in an A' position. Consequently, clause A of Rizzi's *wh*-criterion, which states "a *wh*-operator must be in a Spec-head configuration with X^0 [+wh]" (p.64), is violated at SS in (62) as C^0 is not endowed with a [+neg] feature.[6] The absence of a [+neg] feature in C^0 in (62) is due to the absence of I-to-C movement, as it is during this movement that a finite verb picks up such a feature.

[5] Though in certain discourse contexts the adverbial could be emphasised (focus-shift), followed by a pause to mark intonation, allowing for a structure similar to (62): "*In no case*, I would do that."
[6] The *wh* in the *wh*-criterion can be replaced with *neg* for a negation counterpart of the *wh*-criterion.

Assuming Pollock's (1989) and Belletti's (1990) account of an independent clausal projection NegP between AgrP and TnsP (see Figure 5), it seems straightforward that an inflected verbal element under head-to-head movement, starting from V, passing through I (or Tns) and ending up in C, picks up features along the way (such as [+neg] licensed in the head of NegP). In (61), however, the *wh*-criterion is satisfied because (V-to-)I-to-C movement has salvaged the structure by passing the [+neg] feature onto the verb landing in C. Thereby licensing grammatical V2 word order in negative preposings such as these.

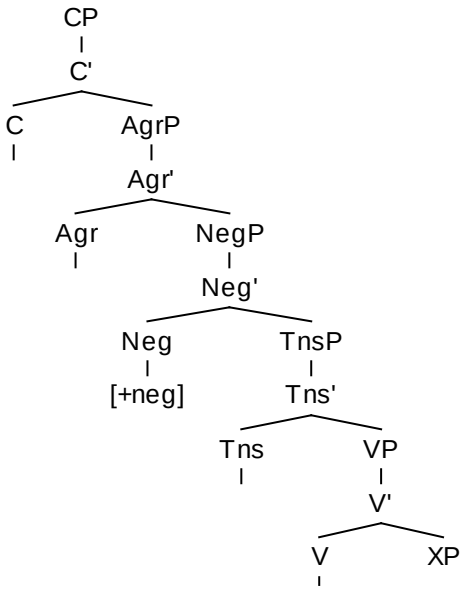


Figure 5. Pollock's NegP (1989)

All of the empirical data elicited in the studies reviewed here on residual V2 and V2 transfer in English were gathered using offline methodologies. Robertson & Sorace (1999:328) concluded from their data that "there is no evidence for such a [V2] constraint in the grammar of these learners *considered as a group*, even at the lowest level." So an explanation considering an underspecification account, which states that V2-L1 learners of English may show residual V2 as a consequence of underspecification of knowledge representations, cannot be generalised towards the entire group of L2 learners of English, and certainly not for near-native speakers of English. The corpus studies discussed above also did not focus on the differences in acceptability of exceptional V2 structures in English between near-native V2-L1 learners of English and native speakers of English. It could very well be the case that near-native V2-L1 learners have only acquired the V2 constraint partially because they are oblivious of its exceptions in stylistic structures such as locative and negative inversion.

Due to repeated specific formal instruction on English word order in grammar school, virtually every Dutch learner of English is aware of the almost complete absence of V2 structures in English. However, locative and negative inversions are not specifically instructed, and are only sporadically encountered in literary writings. A logical result of the little exposure to these constructions would be lower acceptability and less production of these constructions. This does not mean Dutch learners of English never produce V2 structures in their L2 as the added stress of online tasks might give rise to optionality in their L2 comprehension and production (perhaps even lead to L1 transfer). That is, Dutch learners of English would presumably not show a distinction between V2 production in unlicensed

versus licensed English contexts. So it is the knowledge and application of V2 constraints in L2 English that are under investigation here.

Section 3: Research questions and predictions

2.8. Specific research questions

2.8.1. Possessive structures

The slight variation in circumstances between English and Dutch when to adopt which genitive constructions for which particular situations makes this linguistic structure an ideal candidate for testing optionality at the syntax-lexicon interface. Both languages show optionality between prenominal and postnominal genitives, but depending on the lexical and pragmatic context (*e.g.* animacy, definiteness, weight), one of the two structures might be preferred over the other. An L2 learner may not be aware of the different lexical and pragmatic cues that trigger a preference of one genitive construction over the other in the L2. However, a near-native L2 learner will have incorporated this implicitly in their L2 knowledge but could still produce inconsistent genitive constructions in L2 production under time and/or memory stress. That is, advanced to near-native L2 learners may not be able to access L2 knowledge on lexical and pragmatic cues (e.g. animacy features) for genitive selection *in real-time* and as a result revert to L1 genitive structures.

Dutch learners of English are specifically instructed on the influence of possessor animacy on the realisation of the genitive construction in secondary school (i.e. obtain metalinguistic knowledge of the L2). Subsequently it can be hypothesised that advanced learners have similar grammaticality judgements on prenominal and postnominal genitives as native speakers of English in offline tasks. However, Dutch learners of English (even those with advanced to near-native proficiency) may show dissimilar grammaticality judgements and productions in online tasks than native English speakers, not because of grammatical misrepresentations as it can be assumed the lexical-grammatical rules of genitive construction are acquired, but due to a lack of processing resources. So it can be predicted that upper-intermediate Dutch learners of English produce the preferred L2 genitive construction at chance level in both offline and online tasks, whereas near-native Dutch learners of English produce the preferred L2 genitive construction just as much as native speakers of English in offline tasks, but may still show some L1 interference in online tasks.

With respect to genitive selection in online L2 production, it is feasible and noteworthy to investigate the 'primeability' of certain genitive constructions. For example, when an English *of*-genitive is dispreferred in a certain context where the translation-

equivalent of it in Dutch would be preferred in that context, then is it possible to prime a Dutch learner of English to produce this dispreferred genitive in their L2 English? And what if this particular genitive structure is also not preferred in Dutch, *i.e.* can dispreferred structures be primed in general? The answers to these questions have theoretical implications on whether lexical-syntactic structures are shared between a speaker's L1 and L2. For instance, are semantic hierarchies (such as animacy > definiteness > weight) arranged similarly cross-linguistically, or differently? The experiments in this study address these issues, and their results can have significant implications for bilingual language processing models such as de Bot's (1992) model. For example, if ungrammatical L2 lexico-syntactic structures that are grammatical in the L2 learner's L1 can be primed in their L2, then this confirms de Bot's proclamation on shared syntax/lexicon in the formulator (*i.e.* one storage unit for both languages, rather than separate storage units). However, if the results prove the opposite, *i.e.* no L1 interference/transfer, then this implies that the syntax and lexicon modules of bilinguals' L1 and L2 are strictly separated. Subsequently, this would mean that de Bot's model should be updated with two separate storage units in the formulator.

Descriptive grammars like Quirk et al. (1985) confirm English native speaker behaviour with respect to the lexical-syntactic constraints on genitive structures described in the sections above. However, because of the dynamic nature of the syntax-lexicon interface and non-native intuitions of L2 learners of English, it is predicted there may be some variance in production and comprehension among these learners regarding lexical-syntactic dependent genitive structures. In particular, comprehension and production by Dutch learners of English may deviate from native speaker comprehension and production when it concerns postnominal genitive constructions with animate possessors. The reason for this is that in the Dutch language genitives with animate possessors in either prenominal or postnominal genitives both belong to the realm of possible grammatical structures. So we hypothesise that Dutch learners of English –even near-native learners as the interface hypothesis specifically focuses on this population– may not be able to suppress L1 interference in *online* L2 production and comprehension regarding the aforementioned structure at the syntax-lexicon interface as a result of a lack of cognitive resources (under stressed conditions).

The structures to be tested are those that show a different genitival preference between L1 Dutch and L2 English, but also those that show the same genitival preference in Dutch and English. The reason for testing the latter is to find out whether participants opt for the easiest/high-frequent structure even though this may not be the preferred one. For example, when a certain context calls for an *s*-genitive in English, but shows optionality

between an *s*-genitive and an *of*-genitive in Dutch, then Dutch learners of English could accept an *of*-genitive in their L2 English because this structure is lexically more frequent in Dutch even though this structure is not preferable or even ungrammatical in English. It follows that Dutch learners of English are predicted to produce more *of*-genitives in their L2 production. From the literature review above it appears the main distinguishing factor in preference differences between English and Dutch is the animacy factor, especially when there are animate possessors involved which select either a prenominal or postnominal genitive construction in Dutch, but only a prenominal construction in English. In order to test genitival preferences under offline and online conditions the same experimental items were tested under different methodologies in different languages, *i.e.* offline vs online tasks in Dutch as well as English. This leads to the following specific research questions:

Question 1: Do highly advanced/near-native Dutch learners of English possess (meta)linguistic knowledge of all lexical-semantic constraints and their exceptions with respect to *possessive structures* in (offline) L2 *comprehension*, *i.e.* when they have sufficient time to monitor and check explicit L2 knowledge?

Question 2: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-semantic constraints and their exceptions with respect to *possessive structures* in (online) L2 *production*, *i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge?

In order to answer these research questions, we tested comprehension and elicited genitive production among very advanced Dutch learners of English and native speakers of English. The objective here was to investigate the cause(s) of (un)systematic L1 effects at the syntax-lexicon interface of advanced to near-native Dutch learners of English. By examining the syntax-lexicon interface in particular, this study contributes to the knowledge on the ever-growing understanding of interface phenomena and the interface hypothesis (Sorace & Filiaci 2006). This study primarily focuses on how the syntax of a sentence (*i.e.* word order) can be influenced by the lexicon; and whether L2ers are as much aware of the dynamic interaction between the two domains as native speakers (L1ers) are.

In sum, the predictions are that Dutch learners of English accept and produce more *of*-genitives in their online L2 comprehension and production respectively. In general, in offline L2 production, Dutch learners have ample time to monitor their production and are expected to perform like native speakers of English, but the added stress of judging and

producing L2 sentences online is expected to lead to deviant performances than those of native speakers of English, even within near-native speakers. In addition, the results of our experiments should also clarify the role of L1 interference in primeability: are ungrammatical L2 structures whose L1 translation equivalents are grammatical indeed easier to prime than those whose L1 equivalents are ungrammatical, or is primeability of linguistic structures merely a result of the priming process itself, independent of any cross-linguistic equivalents? The answers to these questions provide more insight into the use and effectiveness of priming methodologies in testing near-nativeness and interface phenomena among very advanced L2 learners (this will be discussed in more detail in the section on syntactic priming in the next chapter).

2.8.2. V2 structures

In Dutch the verb always comes in second position after a non-subject constituent, no matter what type of verb. In English, certain verbs only follow non-subject constituents in locative inversions and most verbs are possible in V2 position in negative inversions. Not having the native speaker intuition of which locative inversion constructions are possible, the Dutch learners have to revert to processing techniques in which they have to test the properties of verbs to find out whether they are allowed to appear in V2 position. The added processing strains on top of online L2 comprehension and production may lead to insufficient processing resources, and subsequently errors, such as accepting and producing ungrammatical V2, or 'hypercorrecting' residual V2 to V3 word order.

Experimental tasks are ideal for testing whether advanced/near-native Dutch learners of English have incorporated the exceptional V2 constraints discussed above in their L2 grammar. If it turns out there are significant differences between L2 learners and native speakers of English in an offline comprehension task then this could indicate there is underspecification of grammatical knowledge regarding residual V2 structures in English. A comparison between offline and online data could provide more evidence for either the underspecification account or the processing account. In order to determine if there are any differences in offline grammaticality judgements and *real-time* processing, it would be necessary to test the specific V2 structures mentioned in an online experiment. Consequently, the elicited data provides more quantitative information on processing costs and whether processing resources are depleted when the near-native learner is no longer able to monitor the target language at their own pace. If there are significant differences between native speakers and near-natives under these circumstances, then an explanation considering a processing deficit could turn out to be a more satisfactory explanation to why residual V2

may or may not be observed at the syntax-lexicon interface. In sum, this study investigates (meta)linguistic knowledge of lexical-syntactic constraints on V2 word order in English among advanced/near-native Dutch learners of English, and whether these learners have real-time access to this knowledge, even under extra induced stress by means of time and memory constraints.

It is predicted that there will be variation in production and comprehension of residual V2 in English between advanced/near-native Dutch learners of English and native speakers of English, because of the dynamic nature of the lexical-syntactic V2 constraints at the syntax-lexicon interface and the non-native intuitions of L2 learners of English. As discussed in the sections above, these V2 constraints entail:

a) predicates in locative inversion have to be informationally light (non-eventive).
b) preposed adverbials of manner should contain a negative polarity item.

However, since Dutch has V2 word order by default, it is hypothesised that Dutch learners of English are not particularly aware of the lexical constraints on V2 inversion in English. That is, they might rule out V2 inverted structures because of their knowledge of prescriptive grammar of English (*i.e.* a predominately fixed SVO word order language), or they might accept all types of V2 inversion –independent of the lexical properties that license them– due to L1 transfer effects. This leads to the following specific research questions:

Question 3: Do highly advanced/near-native Dutch learners of English possess (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures in (offline) L2 *comprehension*, *i.e.* when they have sufficient time to monitor and check explicit L2 knowledge?

Question 4: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures in (online) L2 *production*, *i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge?

Question 5: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures after *preposed adverbials of manner* in (online) L2 *production under*

extra stressed conditions, *i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge and on top of that have most –if not all– of their memory resources taken up by an additional task?

In sum, the predictions are that Dutch learners of English experience difficulty in V2 parameter (re)setting in locative inversion and negative inversion at the syntax-lexicon interface in *online* L2 production and processing, because these non-canonical word order sentences are exceptions to the English default V3 word order after preposed adverbials.

2.9. Summary predictions

Cross-linguistic comparisons between Dutch and English show there are subtle differences and optionality with respect to possessive constructions and V2 word order between the two languages. One of the salient differences between Dutch and English is how possessive structures are constructed between the two languages. In English, possessive structures are lexical-semantically conditioned by (amongst others) the animacy of the possessor. That is, when the possessor is animate, a prenominal so-called *s-genitive* (*e.g.* John's bike) is called for. So the word order becomes possessor NP *before* possessum NP. However, in Dutch, animate possessors can also appear in postnominal *van-genitives* (*e.g. de fiets van Jan* 'the bike of John'); so the word order becomes possessum NP followed by the preposition *van* ('of') and the animate possessor NP. The other salient difference in word order between Dutch and English discussed above is *V2 word order*. That is, V2 languages like Dutch and German allow finite lexical verbs to raise from an underlying head final VP through I/T to C in order for the verb to be in second position after a preposed (non-subject) constituent XP in A position. This is highly uncommon in a non-V2 language like English, except when certain lexical properties of the lexical verb allow for locative inversion, or when certain properties of polarity items in preposed adverbials of manner allow for negative inversion.

The different constraints that allow for particular possessive constructions and V2 structures to occur in one language but not the other is what is being investigated in this study, as these discrepancies may be the cause for optionality in L2 comprehension and production among near-natives at the syntax-lexicon interface. Since Dutch learners of English are explicitly taught on English word order in formal L2 instruction at school, and since they are also taught which genitive construction to select depending on the animacy of the possessor, and which word order to adopt after preposed adverbials, (meta)linguistic L2 knowledge should –in principle– prevent advanced Dutch learners of English from making mistakes in English word order with respect to possessive structures and V2 word order

when they are able to monitor their output in offline tasks. However, differences in word order between L1 and L2 speakers are expected to arise when L2 learners do not have instant access to (meta)linguistic L2 knowledge, *i.e.* in *online/stressed* tasks. So the predictions are that optionality arises in L2 English of Dutch near-natives when possessive constructions with prenominal and postnominal genitives with animate possessors are targeted, as Dutch (meta)linguistic knowledge of these structures could interfere (or even be transferred) in L2 English by Dutch learners of English in online tasks. The same is predicted for L2 English V2 word order after preposed adverbials of manner and location by native speakers of Dutch, as this is the default in Dutch, but is dependent on certain constraints in English (polarity of the preposed adverbial, accusativity of the main lexical verb and the information status of the predicate following the adverbial *etc.*).

2.10. The experimental approach

A theory has to be supported by evidence, and one of the ways to test whether a theory holds in the real world is to gather empirical evidence, *e.g.* through corpora searches or by conducting experiments. As we saw in the literature review, Robertson & Sorace (1999) and Rankin (2009) conducted corpora searches on V2 transfer effects in L2 English by German learners of English; Rosenbach (2002) has done the same for possessives with German learners of English. This study adopts the other empirical alternative approach, *viz.* conducting experiments among advanced to near-native Dutch learners of English residing in the Netherlands. The reason for adopting this methodology is that it is more practical when trying to elicit a specific target structure, plus it can also control for *e.g.* context, lexical factors *etc.*, which a corpus study cannot. In addition, not all corpora include information on learners' L2 proficiency skills or socio-economic factors. So by conducting an experiment, one is more likely to target the exact audience in mind, as one has the option to filter out those participants who do not fit the criteria.

The research conducted for this dissertation aims to explain how near-native and native language comprehension and production differ from one another. In doing so it either confirms or falsifies the hypotheses and predictions postulated in the previous section by providing empirical evidence for the differences in offline language competence and online language performance between Dutch L2 learners of English and native speakers of English. It also investigates in what respects Dutch near-native and very advanced L2 learners of English differ in comprehension and production of their English (as L2 proficiency plays a significant role in L2 processing). Since it is impossible to focus on all aspects of L2 proficiency, the focus of this study is on particular L2 English structures that are realised

differently in L1 Dutch, but may still be produced as marked structures in English. In other words, English native speakers may have a clear preference for constructing a particular structure over an awkward –but not completely ungrammatical– alternative structure, but Dutch learners of English could show optionality in constructing these particular structures in their L2 English as a result of possible L1 interference.

2.11. Chapter summary

This chapter reviewed literature on near-nativeness, and in doing so explained the concepts of L2 ultimate attainment, interfaces, the interface hypothesis, and introduced possible explanations for non-convergence between near-native and native language competence and performance by means of discussions on representational, processing and resources accounts and bilingual processing models. It then focused on how to test near-nativeness empirically, *i.e.* a) which criteria the test subjects should adhere to, b) which interface to target, and c) which linguistic structures at this interface would be the best candidates for testing near-native speakers. The answers to these questions resulted in proposing to investigate near-native Dutch learners of English's competence and performance on possessive structures in English, as well as V2 structures like locative inversions and preposed adverbials of manner in English. How these linguistic structures can be tested through certain linguistic experiments will be discussed in the next chapter. It will explain in great detail the methodologies adopted in order to answer the research questions and predictions postulated in this chapter.

Chapter 3 Methodology

3.1. Chapter overview

The previous chapter discussed research on near-nativeness and highlighted knowledge gaps in accounting for non-convergence between near-native and native speaker competence and performance (in particular at the syntax-lexicon interface of Dutch learners of English). It then discussed which specific interface structures in which language pair would be most informative with respect to non-convergence, and how the possibility of optionality in these structures among near-natives can lead to non-native-like competence and performance. This discussion motivated us to focus on possessive and V2 structure dependency on lexical items in English sentences, and in particular to question comprehension and production of these structures among Dutch advanced-to-near-native learners of English and native speakers of English. This chapter discusses the practical issues of how to conduct empirical research on bilingual language comprehension and production, and motivates more specifically which methodologies to adopt when investigating the interface structures mentioned in Chapter 2, *i.e.* which different methodologies are adopted to test both offline and online competence and performance of English possessive and V2 structures among highly advanced to near-native Dutch learners of English. Finally, the chapter discusses different methodologies for increasing workload in online tasks in order to elicit spontaneous (*i.e.* unmonitored) L2 comprehension and production, and methods for assessing L2 proficiency in general.

3.2. Introduction

Examples of traditional methodologies for assessing comprehension and production are Truth-Value Judgement Tasks, Grammaticality Judgement Tasks, cloze tests, structured interviews *etc.* These data elicitation tasks are widely adopted by experimenters as they are practical and easy to set up. For example, in a Truth-Value Judgement Task (Gordon 1996 *inter alia*) the participant is asked to give their opinion on the semantic truth of a sentence given a context, thus leaving the participant with the options of answering either true or false after stimulus presentation. The advantage of this task is that it is usually short and simple for the participant and easy to implement for the experimenter. The disadvantage though is that it does not inform the experimenter on the nature of underlying grammatical representations nor does it on real-time processing as the task focuses more on meaning than form and does not measure the time-course of participants' judgements respectively (though note that the task could be implemented under time constraints).

In a Grammaticality Judgement Task (McDaniel & Smith Cairns 1996 *inter alia*) the focus is usually not on the meaning but on the form of the sentence, *i.e.* participants have to judge *the structure* of a sentence as either being grammatical or ungrammatical. The participants' response can be elicited as a binary true or false (cf. Truth-Value judgement) or on a more detailed scale such as a Likert scale. For example, many Grammaticality Judgement Tasks adopt a 5-point Likert scale ranging from ungrammatical to grammatical with four incremental steps like: ungrammatical, awkward, neutral, passable, grammatical. The advantage of this method is that it gives more detailed information to the experimenter about the participants' attitude towards degrees of grammaticality judgements on certain linguistic structures. In general, a Grammaticality Judgement Task is not too taxing on the participant and it is non-intrusive (no electrodes or other equipment attached to the participant). It is also relatively easy and quick to set up for the experimenter (pen and paper is sufficient, though one could program such a task on the computer). Moreover, this method provides more information on the participants' underlying grammatical representations, but it does not provide accurate information on real-time processing of grammatical structures.

Besides these traditional methods for testing language comprehension, there are also traditional methods widely used for testing language production. For example, the cloze test (Taylor 1953, Oller 1972 *inter alia*) assesses language production skills by means of having participants to fill in a word or sentence fragment in a text where certain words or phrases have been removed. This method taps into the language user's grammar and vocabulary knowledge and their ability to deduce the correct lexical items and their syntactic categories from the context. However, because of the high degree of freedom the language user is given to fill in the blanks, the information integration abilities of the language user can produce different results from what the experimenter had in mind. For example, given the context "It is raining outside" followed by a test sentence with a gap "I really _____ weather like that", the participant could fill in verbs like 'love', 'like', 'hate', 'loathe' *etc.* In this case, the syntactic category of a verb is demanded by the grammar, though the semantics of this verb is determined by the participants' psyche/mood. In order to avoid too much differentiation among participants some cloze tests (like the *Oxford Placement Test* discussed in section 3.7.2) adopt a list of options for participants to choose from, this is called an *objective* cloze test (as opposed to a *subjective* cloze test where the participants are free to choose whatever word/phrase they like). Cloze tests are extensively employed to measure L2 proficiency, but they do have their limitations. For one, they do not measure language production in real-time as the participants have ample time to monitor their production before filling in their

answers.[7] Secondly, cloze tests only measure offline written production, but not online spontaneous speech production.

A traditional production task that does measure spontaneous speech production is the (semi-)structured interview. In this task the experimenter carefully develops questions in such a way that the participant cannot answer them with a simple 'yes' or 'no' but has to provide a more elaborate answer. The degree of spontaneity depends on how structured the interview is and whether the experimenter follows a rigid order of questioning and sticks to the questions he/she has designed, or is more flexible and interacts with the participant by asking different questions based on the participant's answers. The advantage of the interview methodology is that it is relatively easy to design, though the execution can still be labour-intensive (especially when experimenters do not stick to their scripts). It also takes up more time than other traditional production tasks to find the relevant linguistic target structures in the participant's production as the output has to be transcribed and tagged from a recording first. In addition, it will be more laborious to score the elicited linguistic structures compared to traditional language production tasks such as sentence completion as interview methods require multiple raters in order for the scores to be reliable (cf. interrater reliability).

The language comprehension and production tasks described above are all relatively simple to implement and have been used extensively in linguistic research. However, these traditional methods come with certain shortcomings as we have seen, *e.g.* the comprehension tasks do not allow for gradient judgements (with the exception of Likert scales, but even then there is still a discrete scale rather than a smooth gradience on which judgements are made) and for the production tasks it is quite labour-intensive to target specific linguistic structures and the chances of these being produced by the participant are slim. So what about other – less traditional– comprehension and production tasks?

One methodology gaining increasingly more popularity as a substitute for Grammaticality Judgement Tasks is *magnitude estimation* (Bard et al. 1996, Sorace & Keller 2005, Bader & Häussler 2010 *inter alia*). This methodology has its origins in psychophysics (Stevens 1957) and allows the participant to pass judgements on a gradient scale. As a result the participants' judgements are reflected more accurately than on a discrete scale. Sorace (1992) was the first to apply this method to acceptability judgements with respect to linguistic phenomena. So participants are not judging whether a sentence is grammatical or not, but on a gradient (often self-chosen) scale how acceptable they find a particular sentence in relation to a reference sentence (also known as the modulus). A method like this is particularly suitable for testing residual optionality in highly advanced to near-native L2

[7] Although tests can be speeded up so that the participant no longer can monitor their production carefully, this would still mean that there is no exact measurement of the time-course of production.

learners' grammar as it provides the tools for distinguishing between optionality among near-natives and native speaker preferences. As this study focuses on differences between near-nativeness and nativeness, especially with respect to optionality at interfaces, this method is the best suited method for investigating potential differences. The separate section on Magnitude Estimation Tasks (MET) below discusses this methodology in more detail and how it was implemented in this study.

Besides non-traditional methods like MET targeting language comprehension, there are also non-traditional methods targeting language production. One methodology for targeting specific syntactic structures that has been receiving more attention in psycholinguistic research over the last decade is *syntactic priming* (Loebell & Bock 2003, Branigan 2007, Pickering & Ferreira 2008 *inter alia*). This method can be used for testing language comprehension as well as language production, though it is more often adopted in the latter case as the effects have proved to be more robust in production (Branigan 2007). Syntactic priming –also sometimes referred to as structural priming– relies on the human tendency to repeat behaviour (often subconsciously). In linguistics this translates as people's tendency to repeat certain words, phrases or syntactic structures after having heard or read them shortly before. In the words of Branigan (2007:1) "Syntactic priming, then, is the phenomenon by which processing one utterance facilitates processing of another utterance on the basis of repeated syntactic structure. By examining which expressions prime which other expressions, we can draw inferences about the nature of syntactic representation." So by priming specific syntactic structures, this means the focus will shift towards those particular syntactic structures in the participant's subsequent language production. If a structure is successfully primed, even if it was ungrammatical in the first place, this informs the experimenter about the participants' underlying structural representations and their (lack of) knowledge of these representations. So unlike the traditional methodologies of cloze tests and interviews described above, this methodology allows us to target specific syntactic structures relatively easily, and functions as an implicit measure of underlying linguistic representations as well. As we want to focus on particular linguistic structures (the possessive and V2 structures mentioned in Chapter 2), this methodology is an excellent candidate for testing language production differences between near-native and native speakers in this study. In addition, syntactic priming has the advantage of testing spontaneous (*i.e.* unmonitored) speech production without having to resort to artificial measures such as speeding up tasks. Section 3.4 will go into more detail about syntactic priming and how this methodology is tailored to this research.

3.3. Magnitude Estimation Task

As mentioned before a traditional Grammaticality Judgement Task (McDaniel & Smith Cairns 1996 *inter alia*) only provides either a dichotomous option to the participant (a sentence is judged as grammatical or ungrammatical) or fixed options set by the experimenter (*e.g.* 3-, 5-, 7-point Likert scales), but does not leave the option to which extent participants are sensitive towards their preference, and is therefore a less suitable tool for investigating optionality. In a Magnitude Estimation Task (Bard et al. 1996), participants can express their level of acceptability proportionally to a modulus either set by them or by the experimenter. Having the participants to choose their own scale, and giving them the tool to compare acceptability on an interval scale (*n* times more/less acceptable than a modulus) has the advantage of more fine-grained values, so that participants can express their preferences more accurately. Psychometric research (Nunnally 1967) has shown that people are better at giving comparative judgements than absolute judgements in general, *e.g.* 'Is this light brighter or less bright than that light' vs 'Is this light bright?' For our study on near-nativeness, this means that magnitude estimation enables us to investigate residual optionality at the syntax-lexicon interface in much more detail as gradient structures can better be judged on an interval scale rather than a binary scale.

There are several more advantages of employing Magnitude Estimation Tasks over Grammaticality Judgement Tasks for investigating the particular target structures in this study. Not only are traditional grammaticality judgement scales limited in their range of values compared to the unlimited range in magnitude estimation scales, but Grammaticality Judgement Tasks are also inconsistent in application (*e.g.* what is the difference in meaning of judgements on a 3-point Likert Scale compared to those on a 10-point Likert scale). Secondly, judgements in a Grammaticality Judgement Task cannot be analysed via parametric statistics as the data is not normally distributed, whereas the data in Magnitude Estimation Tasks can easily be normalized by simply dividing the numerical judgements by the modulus (another method would be by log transforming the data into *z* scores). Thirdly, different linguistic constraints are difficult to judge and compare in one Grammaticality Judgement Task, whereas this is not the case in a Magnitude Estimation Task. Finally, and most importantly for this research, it is difficult or almost impossible to capture linguistic gradience –and as a result also developmental optionality– through a Grammaticality Judgement Task compared to a Magnitude Estimation Task, and even more so to interpret this data (*e.g.* what does the exact middle value on a rating scale comprise).

In order to test language comprehension involving the particular linguistic structures at the syntax-lexicon interface discussed in the previous chapter, a Magnitude Estimation

Task was adopted, as this particular methodology provides more room for fine-grained acceptability judgements among participants. Some structures in English or Dutch can be acceptable, but are less preferred than their alternatives, and hence give rise to optionality (*e.g.* see the discussion on cut-off points between *s*-genitives and *of*-genitives in the previous chapter). In the Magnitude Estimation Task, L1 and L2 speakers were asked to judge grammatical, marked and ungrammatical sentences in comparison to a reference sentence in both English and Dutch.[8] As the participants have enough time and memory resources at their disposal to pass judgements on the L2 stimuli carefully during a Magnitude Estimation Task, this task can be interpreted as an offline task. A comprehensive description on how to conduct a Magnitude Estimation Task follows.

A Magnitude Estimation Task with a self-chosen modulus typically starts with a calibration where the participants are asked to rate a line length by assigning it a positive numerical value greater than 1 as a modulus.[9] Subsequent lines of various lengths are presented to the participants and they are instructed to rate these with numerical values proportioned to the numerical value they assigned to the reference line. So when the participants judged a line length to be twice as long as the reference line, then they would assign a numerical value twice the value of the one they assigned to the reference line. After a practice session of at least eight line lengths, the participants are presented with a reference sentence that is not entirely ungrammatical –but at the least marked– and they are asked to rate this with a positive numerical value greater than 1 and treat it as a reference value/modulus for future ratings on sentence acceptability.[10]

Another practice session follows with sentences, where the participants are instructed to rate their acceptability of the sentences in the same manner as they rated line lengths. So, for example, when participants judged a sentence to *sound* four times more acceptable than the reference sentence, they would assign a numerical value four times greater than the value they assigned to the reference sentence. The same goes for more marked structures, *e.g.* where a participant rates a sentence sounding half as acceptable as the reference sentence, then they would assign it half the value of the one they gave to the reference sentence. The participants are explicitly instructed to judge only the structure (syntax) of the sentence and not the meaning (semantics). In both line length and sentence acceptability calibration, the experimenter may choose whether to leave the reference line/sentence in sight for the participant or not. In the Magnitude Estimation Tasks

[8] Only the Dutch L2 learners of English had to judge the Dutch sentences, but both L1ers and L2ers judged the English sentences.
[9] This in order to avoid fractions when the participants have to rate line lengths shorter than the modulus.
[10] Bard et al. (1996) used twelve line lengths to illustrate the advantage of adopting an interval scale.

conducted for this research, we chose to present the modulus always together with the line/sentence to be judged. The rationale behind this is that we did not want to introduce an additional between-subjects factor as participants' memory abilities will obviously vary from one another. The exact procedure, number of stimuli, ratio experimental:filler items, randomisation *etc.* varied per experiment and are reported in the procedure sections of the experiments dealing with the possessive structures (Chapter 4) and V2 structures (Chapter 5).

In sum, for the purposes of our research on near-nativeness we chose to adopt Magnitude Estimation Tasks rather than Grammaticality Judgement Tasks, as these suit the kind of data we are testing and make a better tool for interpreting offline L2 comprehension among Dutch learners of English. The explanation and examples above illustrate how magnitude estimation is far more suitable for judging gradient structures in sentences than the traditional fixed/binary Grammaticality Judgement Task. Magnitude estimation provides more freedom for participants' subjective judgements as they can rate acceptability with respect to a (self-chosen) modulus on a self-chosen interval scale.

3.4. Syntactic Priming Task

In Bock's (1986) seminal study on syntactic priming she ran an experiment in which she asked her participants to repeat a sentence out loud before describing a picture unrelated to the repeated sentence, disguising the purpose of the experiment by asking her participants whether they have encountered the sentence or picture before. The results of this study unambiguously confirmed that participants were led to repeat certain syntactic structures in their picture description by the syntactic structures in the preceding sentences they repeated. That is, when the participants were primed with a passive *prime* sentence (*The referee was punched by one of the fans*), participants were more likely to produce a passive *target* sentence in describing the following picture unrelated to the repeated sentence (*The church was struck by lightning*). The same observation was made for sentences with *prepositional objects* (*The man is reading a story to the boy*) and *double objects* (*The man is reading the boy a story*), where the syntactic structure of the prime sentence was more likely to be repeated in the target sentence than its alternative.

Other studies have confirmed that priming effects do not only occur within a language, but also across languages (Loebell & Bock 2003, Schoonbaert, Hartsuiker & Pickering 2007, Bernolet, Hartsuiker & Pickering 2007). Loebell & Bock (2003) investigated fluent German-English bilinguals who had to repeat a *prime* sentence in one of their languages and then produce a *target* sentence by describing a picture in their other

language. The structures tested in this study were the same as in Bock's (1986) study. The results showed that German datives could prime the same English dative constructions and vice versa. For example, a double object dative construction in German could prime the same syntactic structure in English, or a prepositional object dative construction in English could prime the same syntactic configuration in German. However, the results also revealed that only those syntactic structures that are configurationally similar in both languages could be primed cross-linguistically. For instance, dative and active sentence structures were produced as a result of priming from English into German and vice versa, but there was no evidence of cross-linguistic priming when passive constructions were concerned. In German passive structures the main verb occurs at the end of the sentence (*Die Böden werden täglich von dem Hausmeister* ***gereinigt***), whereas this is not the case in English (*The floors are* ***cleaned*** *daily by the janitor*) and because of this cross-linguistic difference the passive structure was not likely to be primed between English and German. This implies that syntactic features that are similar in a bilingual's language pair could be stored linearly together in one shared processing unit (cf. de Bot's (1992) model discussed in Chapter 2 in which the bilingual's formulator is hypothesised to share certain lexical and syntactic items dependent on the bilingual's language pair).

Hartsuiker, Pickering & Veltkamp (2004) pursued this issue of whether syntax is separate or shared between languages. In their cross-linguistic Syntactic Priming Task among Spanish-English bilinguals they provided evidence that when primed with passive sentence constructions in Spanish, these bilinguals produced a passive sentence construction significantly more than an active sentence construction in English. They did so by adopting Branigan, Pickering & Cleland's (2000) method in which a confederate was reading out loud scripted sentences in Spanish and a naïve participant had to check whether the sentence read out loud described a card with a picture in front of him. Then the roles were reversed and the naïve participant had to describe a picture in English –not read a sentence out loud like the confederate– to the confederate participant.[11] The cross-linguistic priming effect in passive constructions between Spanish and English is explained by means of a combinatorial network adopted from Pickering & Branigan (1998), quite similar in nature to the spreading activation account we saw in Poulisse & Bongaerts (1994) model for lexical access in bilinguals (see Chapter 2, section 2.3). Figure 6 below (Hartsuiker et al. 2004: Figure 2) shows how the activation of one node in the bilingual's model can activate another node in the model, and as a result how one structure in one language can lead to repetition of this structure in the other language.

[11] The confederate and naïve participant's cards with sentences and pictures were not visible to each other as there was a divider between the two of them.

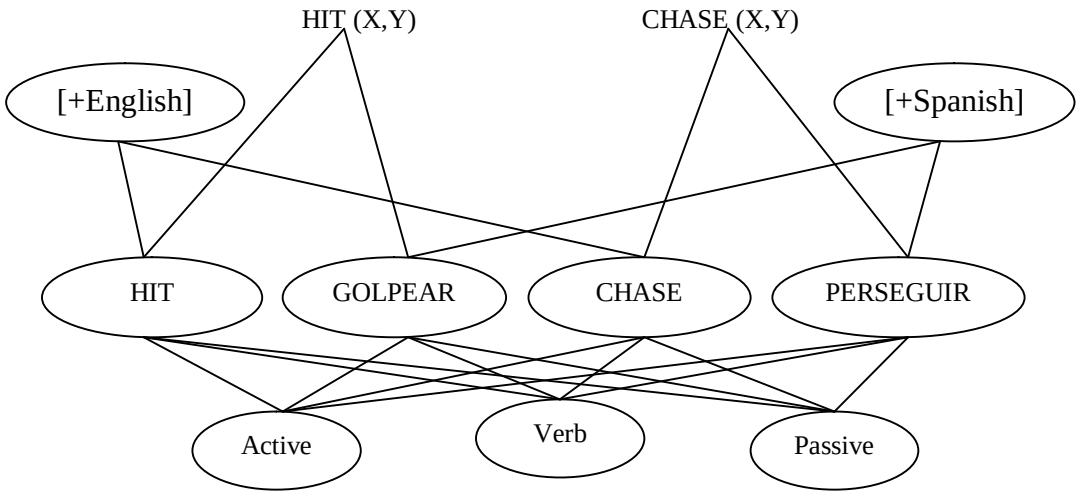


Figure 6. Bilingual lexical access and structural priming through a combinatorial network
Adopted from Hartsuiker et al. (2004: Fig. 2)

So in Figure 6 the conceptual node (cf. Levelt's 'preverbal message') could entail something like 'X hits Y', activating the lemmas 'hit' in English and 'golpear' in Spanish in the English/Spanish bilingual's lexicon (cf. Levelt's and de Bot's models in Chapter 2), where each of these lemmas are linked to a category node ('verb' taking two arguments X and Y) and a combinatorial node ('active' or 'passive'). So when a passive construction with the Spanish verb 'golpear' is heard and repeated by an English/Spanish bilingual, this construction is fed back into the speech-comprehension system and parsed at the conceptual level (cf. Levelt's model), thereby activating the conceptual node HIT(X,Y). This node in its turn fires both the 'golpear' and 'hit' lemmas and depending on the environment (*e.g.* instructions of the experiment, bilingual's language mode *etc*.) selects one of these for speech output (cf. articulator). Thus when the English verb 'hit' linked to a combinatorial 'passive' node is activated through this network then cross-linguistic priming has successfully taken place.

In sum, evidence from previous crosslinguistic priming studies among bilinguals (Loebell & Bock 2003, Scheepers 2003, Desmet & Declerq 2006) show that where the bilingual's languages share similar syntactic structures (*e.g.* word order in German and Dutch) that these structures can be primed cross-linguistically, whereas no priming effects occur where the syntactic features between the bilingual's languages are dissimilar (*e.g.* transitivity in German and English). Now the question is to what extent this is applicable to L2 *learners* –those who have not fully mastered their second language– and to those that have, *i.e.* near-native speakers. As discussed in Chapter 2, it was established that functional bilinguals (L1=L2) share more syntactic and lexical features during language processing than early L2 learners (L1>L2), and thus might prove more susceptible to syntactic priming.

However, if syntactic structures are exactly the same between an L2 learner's L1 and their L2, then their L1 knowledge could in fact support their L2 performance with respect to these syntactic structures. In order to test whether there is a difference in susceptibility to priming, this study will target intermediate, advanced and near-native L2 learners. Not only will we be priming syntactic structures that are similar between the L1 and L2, but also those that are dissimilar, and so investigate whether L1 transfer can be primed in L2 production –or more generally whether the L1 interferes in the L2.

Though testing for L1 interference and the role of L2 (meta)linguistic knowledge in near-nativeness is the primary research objective for this study, this study will also scrutinise native speaker susceptibility to structural priming of ungrammatical or slightly odd syntactic structures. There is recent evidence that native speakers can be primed into producing ungrammatical sentences under specific conditions. Ivanova et al. (2012) showed that ungrammatical verb-construction combinations like "*The dancer donates the soldier the apple" could be primed after exposure to related ungrammatical structures. According to them ungrammatical argument structure in relation to the verb is to be explained via a 'lexically-driven persistence account' (cf. shallow parsing) in which language users "form associations between individual verbs and a construction on an item-by-item basis" (p. 8). That is, priming effects were only found when the exact *same* verb was shared between prime and target constructions and *not* similar but different verbs in verb-construction prime-target combinations. So participants could only be primed into producing an ungrammatical verb-construction combination like "The dancer donates the soldier the apple", where the non-alternating verb 'donate' does not allow for a double object construction, after having processed a similar ungrammatical verb-construction combination with the same verb, *e.g.* "The waitress donates the monk the book" and not by a prime construction with a similar verb-construction, *e.g.* "The waitress gives the monk the book".

Another label –but essentially the same paradigm– for this phenomenon of lexically-driven processing is the 'Good Enough' approach to language processing (Ferreira, Ferraro & Bailey 2002, Ferreira & Patson 2007 *inter alia*). This paradigm predicts that when language comprehenders/speakers are pressurised, they will process linguistic structures not hierarchically but linearly. So the assumption is that when a processing system is resource limited (e.g. by time and/or working memory load in a syntactic priming task) speakers must make their decisions quickly, and in order to save time opt for "fast and frugal heuristics" (Ferreira & Patson 2007: 72, 80). This means

that instead of building up each structure hierarchically and checking for every potential candidate in the syntactic tree, the parser simply processes information linearly where the first viable lexical option is 'good enough' to prevent the system from breaking down communication altogether. Although this processing strategy could lead to misinterpretations or ungrammatical productions initially, the main purpose of keeping communication intact is served. In sum, when pressurised the parser underspecifies initially (i.e. trying to get away with the least amount of work to arrive at a meaning for a sentence) in order to save computational resources and revises only in the case of a breakdown in communication, and in doing so only aims for the fewest changes possible to fix the problem. The aim for striving for optimal processing efficiency with respect to initial processing costs is something that we will test not only in the L2 learners, but also in the native speakers when we adopt syntactic priming tasks with additional limitations to cognitive resources imposed on them.

So, adopting a priming paradigm will not only test for L1 interference in L2 production, but also the 'willingness' of native speakers to copy an ungrammatical or slightly odd linguistic structure in their language production (in our case at the syntax-lexicon interface). This *versatility* of a priming paradigm is one of the advantages of this methodology over the more traditional language production methodologies discussed earlier on.

There are more reasons, however, why we chose to adopt a syntactic priming paradigm for testing online language production. First of all, it gives the experimenter a greater level of experimental control as priming can involve *within-items* comparisons rather than *between-items* (see also Pickering & Ferreira 2008 for a discussion), *i.e.* comparisons are drawn from observations among the same target event, whereas other methodologies usually draw comparisons from observations among different target events. Secondly, syntactic priming has proven to be robust as similar priming patterns under different experimental conditions have been reported, such as "isolated picture descriptions, sentence-onset completion, memory-based production, interactive dialogue, and even in corpora of naturally occurring text." (Pickering & Ferreira 2008: 454). The most important reason for adopting priming in our study is that it targets both language comprehension and production, and moreover forms a bridge between comprehension and production. Pickering & Ferreira (2008) hypothesise that "comprehension and production involve the same representations (*i.e.*, parity)" and that "both processes draw on common representations of linguistic information, particularly ones associated with syntax" (p. 441). As the linguistic structures tested in our study focus on the syntax-lexicon interface, syntactic priming seems to be the

perfect tool for targeting both comprehension and production and for priming between comprehension and production (the so-called *comprehension-to-production overlap*).

An additional advantage of syntactic priming over traditional production tasks like (semi-)structured interviews is that it is useful for focusing on one specific syntactic structure. Naturally, one would want to investigate spontaneous speech, but chances are slim that participants produce numerous instances of the exact structure(s) under investigation to draw any statistically significant results from, *i.e.* it may not be so straightforward to have a participant produce the target structure(s), or compare one specific structure with another specific structure, in natural speech. Minimal pairs can easily be produced and tested in Syntactic Priming Tasks, thereby steering the language production marginally without interfering too much.

Though the experimenter is not measuring the time-course of the participants' production, syntactic priming can still be regarded as an online task as the participants involved in such a task do not have enough time to carefully monitor their utterances like they do in offline tasks: the former task involves real-time linguistic processing within the same time span as it takes the participant to utter a sentence, whereas in the latter linguistic processing can still be done real-time but the participant is left with sufficient time to carefully integrate all of their (meta)linguistic knowledge without being bound by a limited time span in which the sentence is uttered. So priming studies analyse the first response that the participant produces. In sum, being bound to a limited time window, in which one has to respond as quickly as possible, following a prime sentence or a distracter sentence, has the advantage of blocking out most explicit linguistic L2 knowledge the participant may possess, thereby facilitating an unmonitored utterance on the participants' part (i.e. initial response).

As discussed above, one of the questions current in near-native research is to what extent syntactic knowledge is shared among advanced second language learners, near-natives and bilinguals, and whether the L1 and L2 are represented and processed in the same way. Our research taps into that specific question as the research questions (see Chapter 2) are concerned with how the structural differences in lexico-syntactic representations between native speakers and near-native L2 learners are processed. In our priming set-up we decided to follow the likes of Potter & Lombardi (1998), Flett (2006), Van Gompel et al. (2006), Bock et al. (2007), Ivanova et al. (2012) *etc.* in having the participant read (and comprehend) a prime sentence in a Sentence-Picture Matching Task whereupon they subsequently needed to produce a target sentence in a Picture Description Task. This method thus draws upon both comprehension and production, dependent on what is shared between production and comprehension, ensuring an overlap between both language modalities.

In the online experiments in this dissertation genitive and residual V2 production among very advanced to near-native Dutch learners of English and native speakers of English were examined using a syntactic priming paradigm. The structure of the experimental sentences were manipulated with respect to prime type within participants, *i.e.* Genitive Type (prenominal vs postnominal) for the experiments on possessive structures and Verb Type (unaccusative vs unergative) for the experiments on locative inversions, and Polarity (negative vs positive) and Word Order (V2 vs V3) for the experiments on preposed adverbials of manner. If Dutch learners of English can be primed into producing a Dutch genitive structure (*e.g.* postnominal genitive with animate possessor) whereas the same prime sentence would elicit an English genitive structure (*e.g.* prenominal genitive with animate possessor) within English participants, or if they can be primed into producing ungrammatical V2 word order, whereas the same prime sentence would elicit V3 word order within English participants, this could point to Dutch grammar pervading through in English online L2 production in the former group. The chapters on possessive structures (Chapter 4) and V2 structures (Chapter 5) provide more detail on how exactly the Syntactic Priming Tasks were implemented to test each of these linguistic structures.

In addition to the research questions presented in Chapter 2, the specific empirical approach of Syntactic Priming Tasks should answer the following questions as well:

1) In terms of online priming, can highly advanced to near-native Dutch learners of English be primed into producing ungrammatical English structures?
2) Can native speakers of English be primed into producing ungrammatical English structures to the same extent as the Dutch learners of English?

3.4.1. Syntactic Priming Task with Digit Recall Task

The literature review in Chapter 2 discussed several studies claiming that second language processing resembles first language processing under stress (McDonald 2006, Hopp 2010). Hartsuiker & Barkhuysen (2006) investigated L1 processing under stress as well by focusing on the role of working memory in language production. They did so by eliciting number agreement errors between subjects and verbs with long distance dependencies in spoken sentence completion among two groups of participants. One group consisted of those participants that were asked to retain a word list whilst completing sentences, and the other participants did not have to retain this word list whilst performing the same Sentence Completion Task. The results revealed that low memory span speakers were mostly affected by the extrinsic work load, *i.e.* the factors memory span and memory load interacted

significantly only among those participants who proved to have a low memory span. This was established through a separate speaking span test where the participants were asked to create sentences from a list of 2-5 words that appeared one at a time on screen after which they had to create a sentence with these words in the same order and form as they appeared (see e.g. Sleiderink 1996). From this they concluded that the syntactic planning process in language processing (cf. Levelt's formulator) is limited by verbal working memory capacity.

For the experiments in this thesis, syntactic priming was adopted as an online methodology to test real-time access to linguistic knowledge of lexical constraints on word order, as it is a robust method for testing unconscious L1 interference in the participants' L2, but also for testing subconscious influence of a prime on target production within L1 speakers. Under sufficient stress, marked structures (dispreferred or ungrammatical) could be repeated due to the limited time frame in which participants need to respond and produce, and so-called *priming effects* ensue. The chances of this happening are greater for those who have fewer resources at their disposal (cf. Hartsuiker & Barkhuysen 2006) and as a result cannot come up with a grammatical equivalent target production on time. Subsequently, one would expect this to occur more among L2 learners of a language than native speakers of that language, especially when the ungrammatical L2 structure is grammatical in the learner's L1 (cf. transfer).

To find out whether resource limitations in general affect production, we tested our participants with Syntactic Priming Tasks under extra workload (*viz.* a Digit Recall Task). These Syntactic Priming Tasks were conducted among L1 speakers and advanced-to-near-native L2 speakers in order to investigate whether having to deal with two languages at the same time could act as a limitation on working memory access in real-time. That is, monolinguals only have to make a decision about the choice of words (lexicon), word order (syntax) *etc. within* their language in real-time language production, whereas bilinguals have to do this too but also *between* their languages, thereby inhibiting one or the other language (cf. inhibitory control). So the conjecture is that by overloading a bilingual or L2 learner with extra workload could affect the inhibition process of keeping the two languages separate and hence some interference from the L1 could occur in L2 production or vice versa (resulting possibly in transfer effects).

Not all linguistic structures are judged equally ungrammatical by native speakers and L2 learners, *i.e.* most of the time there is a certain gradience in ungrammaticality: ranging from completely ungrammatical to slightly dispreferred or merely an odd formulation (Bard et al. 1996, Sorace 2000b, Bader & Häussler 2010, Weskott & Fanselow 2011 *inter alia*; see also discussion under Magnitude Estimation Tasks, section 3.3). In the former case,

ungrammaticality is unlikely to be primed in near-native Dutch learners of English, but it could still be primed when these L2 learners are put under significant stress (*e.g.* by overloading memory resources or providing insufficient time to monitor and process certain linguistic structures). In these cases the odd gradient ungrammatical utterance is more likely to pervade in online L2 comprehension and production. In the latter case, it would be possible that, dependent on the discourse and/or context, certain primed structures may transfer from L1 to L2, producing a dispreferred but not ungrammatical L2 structure. Another possible scenario is that metalinguistic knowledge may be transferred, and as a result of priming, an odd L2 structure ensues. That is, knowledge of how to construct a particular syntactic structure in the L1 could be applied to structures in the L2, even though the resulting syntactic structure in the L2 does not adhere to the syntactic rules of the L2.

For example, Figure 7 below illustrates how metalinguistic syntactic knowledge on creating possessive structures in L1 Dutch could be transferred to L2 English production via syntactic priming (cf. Pickering & Branigan's (1998) model, Figure 1).

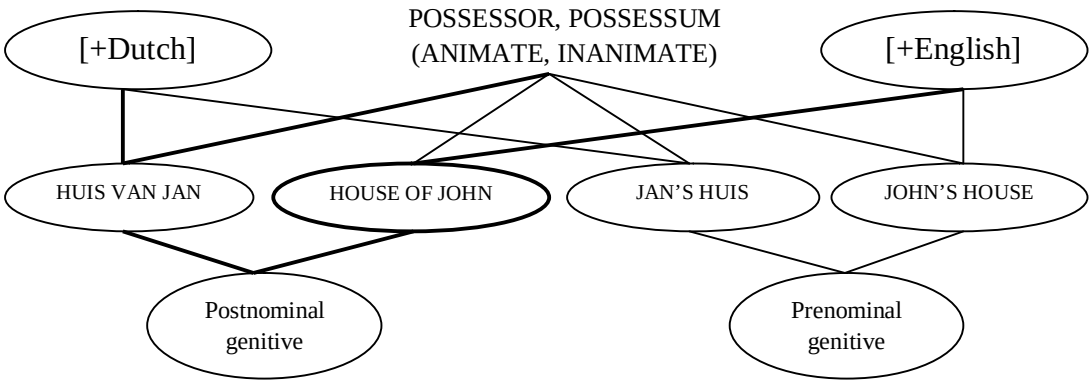


Figure 7. Syntactic priming of metalinguistic knowledge (cf. Pickering & Branigan 1998: Fig. 1)

When a Dutch postnominal genitive with an animate possessor and an inanimate possessum is primed (*e.g. huis van Jan*, 'house of John') among Dutch learners of English, this triggers the Dutch linguistic rules on creating a possessive structure with an inanimate possessum ('*huis'*) preceding the preposition indicating possession ('*van'*) and then the animate possessor ('*Jan'*), but as the language mode switches to English due to the demands of the task, this postnominal genitive construction could be transferred into L2 English, resulting in a marked structure like 'house of John'. Figure 7 displays the links responsible for spreading activation in bold.

Moreover, in the Syntactic Priming Tasks in this study, not only L2 learners but also L1 speakers were primed by exposure to grammatical, ungrammatical and marked but not completely ungrammatical prime sentences, and subsequently asked to produce sentences. The reason for doing this is that it allows the experimenter to investigate whether differences in *real-time* language production are due to underspecification of grammatical knowledge or are due to processing deficits resulting from time stress and/or other cognitive constraints such as increased memory load.

Thus, a Syntactic Priming Task with an added Digit Recall Task was conducted in order to examine the influence of restricted access to working memory (encompassing linguistic knowledge a.o.) on online production and whether the increase in memory load could repress any monitoring activity that would lead to incorrect application of prescriptive grammar (also sometimes referred to as "hypercorrection"). The added Digit Recall Task burdened the memory load of the participant by having them to memorise a digit list before the prime sentence in the Sentence-Picture Matching Task, and having them to recall this list after the target L2 production in the Picture Description Task. The rationale behind this is that very advanced/near-native L2 learners may possess such increased processing capacities due to their exceptional command of the L2 that they may still be able to monitor and integrate (meta)linguistic L2 knowledge real-time. Since the aim of this research on near-nativeness is to compare automatic L2 responses with instinctive L1 utterances, an added stress task is applied to the Syntactic Priming Task in order to block out any potential monitoring activities by the L2 learner (*i.e.* access to (meta)linguistic L2 knowledge) by overloading processing resources. This would ideally result in unmonitored responses by the participants to the prime sentences.

The results are compared with the results of the priming experiment without this stress task. All other factors such as age of L2 onset, participant age, L2 proficiency, experimental stimuli *etc.* were kept constant as much as possible between the experiments, so that any significant differences between the Syntactic Priming Tasks can only be attributed to the added memory load of the Digit Recall Task. The predictions are that native speakers continue producing grammatical structures despite the extra memory load (cf. Hartsuiker & Barkhuysen's high-span speakers), but L2 learners will be more prone to producing ungrammatical structures as a result of the prime sentences in combination with reduced or no access to (meta)linguistic L2 knowledge (cf. low-span speakers). The real question here is whether advanced to near-native L2 learners are dependent on metalinguistic knowledge; or can they operate on the basis of implicit knowledge alone? Chapter 6 will go into more detail about the exact materials and procedure adopted for this type of experiment.

3.5. Speeded Grammaticality Judgement Task

Besides increasing memory load, there are other means for testing language comprehension and production under stress, such as restricting the time allowed to process or produce a sentence. One method of implementing this is by speeding up comprehension tasks, *i.e.* allowing the participant only to interact with linguistic materials in a brief time window. In recent research this method has been applied in so-called speeded Grammaticality Judgement Tasks (Bader & Meng 1999, Fodor & Inoue 2000, Miller, Leonard & Finneran 2008, Bader & Häussler 2010 *inter alia*). This methodology is in all aspects similar to the traditional Grammaticality Judgement Task methodology discussed above except for the added time constraint in which the participant has to respond. It is this extra time constraint that increases processing costs among participants as they do not have the opportunity to carefully parse the sentence at their own pace anymore (in Levelt's model this is the arrow from the speech-comprehension system to the monitoring mechanism in the conceptualizer, see Figure 2 Chapter 2). In this study we will adopt this method too even though we pleaded in favour of Magnitude Estimation Tasks for testing offline comprehension. The reason for opting for a speeded Grammaticality Judgement Task over a speeded Magnitude Estimation Task is that as participants are put under considerable time pressure, a speeded Magnitude Estimation Task might prove to be too taxing as there is always a time-consuming recalculation involved of the numerical values given to the reference sentence and previous items. So a simple binary speeded Grammaticality Judgement Task, in which the participants only have to indicate whether they find a sentence grammatical or not, is more suitable for testing comprehension under significant time pressure.

The data in Bader & Häussler (2010) showed that there is a high correlation between magnitude estimation and speeded grammaticality judgements within and across different sessions. So this means that for our research purposes we can compare the data obtained from previously conducted Magnitude Estimation Tasks with the data elicited by means of a speeded Grammaticality Judgement Task. In addition, Bader & Häussler argue that grammaticality judgements are more informative to the experimenter than magnitude estimations, as there is no reference sentence involved. That is, one could for instance make out that in 80% of the times a particular sentence was deemed grammatical and this would mean more to the investigator than for example magnitude estimation data in which it says that a particular sentence was four times more preferred than the reference sentence. This makes grammaticality judgement data more easy to compare with data obtained via other experiments. On the other hand, it is argued in section 3.3 that for the participants it is easier to perform magnitude estimations than grammaticality judgements, as they are given a

reference point in the former task (*e.g.* "Is this light brighter than that light?" vs "Is this light bright?"). So there is a trade-off here: using Magnitude Estimation Tasks benefits the participant, but using Grammaticality Judgement Tasks benefits the experimenter. However, adopting both these methodologies in our research enables us to benefit from the advantages of these tasks as well as allows us to compare the data with one another (provided the tested linguistic structures are the same).

3.6. Speeded Sentence Completion Task

Speeded sentence completion (see *e.g.* Cronbach & Warrington 1951, Koda 1989) is a method that elicits unmonitored speech production, but one that still allows the experimenter to steer the language production towards a particular linguistic structure. Just like the Digit Recall Task that was added to the Syntactic Priming Task, this task also taps into the (lack of) resources by the participants. However, it does not overload the memory resources but the processing resources by putting the participants under time stress.

In our research the speeded Grammaticality Judgement Task was conducted together with a speeded Sentence Completion Task among advanced Dutch learners of English and native speakers of English, as this would ensure not only *between-subjects* but also *within-subjects* comparisons of differences in language comprehension and production. Half of the Dutch learner population and the native speaker population performed the speeded Grammaticality Judgement Task first followed by the speeded Sentence Completion Task (*i.e.* comprehension before production), and the other half of these populations performed the tasks in the reverse order (*i.e.* production before comprehension).

In the speeded Sentence Completion Task for this study, participants were presented with an incomplete sentence that they were expected to complete with a verb given to them within a narrow time frame. The exact materials and procedure for administering both speeded Grammaticality Judgement Tasks and speeded Sentence Completion Tasks are discussed in more detail in Chapter 6.

3.7. Testing for L2 proficiency

Previous research (Robertson & Sorace 1999, Rosenbach 2002) investigated L2 comprehension and production of German learners of English with respect to V2 word order and possessive structures respectively, but these did not include learners of *different* L2 proficiencies at the high-end of the near-native scale. Our study examines advanced, very advanced and near-native Dutch L2 learners of English, in which the last group is native-like in most L2 domains such that native speakers of English were unable to distinguish these L2

speakers from L1 speakers of English. Including this near-native experimental group has not been done in the studies mentioned above (see literature review Chapter 2). The reason for including this group in our study is that it is of particular importance to test the *interface hypothesis* as this hypothesis specifically targets L2 learners at the L2 end stage (Sorace & Filiaci 2006, Sorace 2011, Sorace 2012). In other words, our study investigates the slight differences in comprehension and production between native speakers and L2 learners who have reached ultimate L2 attainment and are no longer in a developmental stage – moreover, it attempts to present explanations for these differences. Differences in L2 processing between this group and native speakers of English could provide valuable information on which features under which circumstances (stressed or not) are very hard to acquire or even likely to 'fossilise' when it comes to near-nativeness.

As this research tests the *interface hypothesis* and targets different groups varying from advanced to near-native Dutch learners of English, several methods had to be adopted to filter those L2 learners out of the analyses who did not meet the advanced to near-native criteria in their L2 English. In order to do this several tests for assessing L2 proficiency were adopted. In experiments 1 to 4, L2 proficiency was measured qualitatively by means of judging the participants' level on their academic degree, *i.e.* these participants all had –or were studying towards– a degree in English Language and Culture (BA, MA, PhD). In addition, in the online experiments 2 and 4, participants were also assessed on near-nativeness via free speech tasks (section 3.7.1.) by native speakers of English. L2 proficiency was measured quantitatively in experiments 5 and 6 according to the results obtained in the grammar part of the Oxford Placement Task (section 3.7.2.). In experiments 7 and 8, lecturers at Radboud University Nijmegen selected Dutch students from their degree programme English Language and Culture who were all diagnosed with C1 level or above (from the Common European Framework of References for languages, CEFR) in their language lab course work.

3.7.1. Free speech tasks

In order to assess Dutch L2 learner's L2 proficiency of English in our online experiments, this research followed Sorace & Filiaci (2006) and Tsimpli et al. (2004) in adopting White & Genessee's (1996) method for assessing near-nativeness, *viz.* by having native speakers of English listen to speech samples of L2 learners and respectively having them assess the learner's English language production with respect to the following six criteria: syntax, lexicon, morphology, pronunciation, fluency, overall impression (see Table 3 below).

Table 3. White & Genessee's (1996) criteria for examining near-nativeness

Criterion	Defines
SYNTAX	*Word order*
LEXICON	*Appropriateness/precision of words used*
MORPHOLOGY	*Tense/agreement inflections*
PRONUNCIATION	*Accent; phonetic accuracy*
FLUENCY	*Rate of speech; ease of delivery*
OVERALL IMPRESSION	*The extent to which the speaker speaks good English on the basis of all the criteria above*

The native speakers were rating each of these criteria on a continuous scale, *i.e.* a line with the label 'non-native' on the left, and 'native' on the right, on which they had to put a cross according to their judgement, as in the example below:

NON-NATIVE NATIVE

LEXICON: _____

Subsequently, these native speaker ratings were turned into discrete values (1 to 9) by laying a model sheet over the ratings (see Appendix H), and only those who scored between 7.5 and 9 on both syntax and lexicon criteria were included in the analyses (see Chapters 4 and 5).[12] The native speakers of English were only allowed to listen once to the L2 speech samples because it is the very first impression that counted. The speech samples were elicited via three free speech tasks.

Firstly, after the Syntactic Priming Tasks the participants were asked to answer the following three questions:

i) Could you describe what you have just done in this experiment?
ii) Could you expand on that answer?
iii) What do you think was the purpose of this experiment?

The participants' L2 production was recorded with a headset connected to the laptop as well as with a stand-alone Zoom 2 digital voice recorder throughout the experiment.

[12] As this study targets the syntax-lexicon interface in particular, it suffices to adopt only these criteria strictly.

Secondly, participants were subjected to a Thematic Apperception Test (Murray & Morgan 1930 *inter alia*). This test is a projective psychological test (cf. Rorschach test) in which the participant was shown a picture containing a provocative –yet ambiguous– scene of which the participant was asked to tell a story about (see Appendix H). The dramatic story had to answer the following questions:

i) What has led up to the event shown?
ii) What is happening at the moment?
iii) What are the characters feeling and thinking?
iv) What happens afterwards?

Thirdly, participants had to answer pre-recorded questions, played back to them via Audacity® on a MacBook®. The questions were asked by a native speaker of English (this in order to prevent L2 alignment with the Dutch experimenter). The questions were either open questions or scrupulous questions (see Appendix H), to which the participants could not simply answer 'yes' or 'no', but had to provide an elaborate motivated answer.

The main objective of all these semi-spontaneous elicited speech tasks was to elicit as much free speech as possible, so that samples of recorded speech could be taken from both native and non-native populations. Subsequently, the speech samples of both populations were mixed randomly in order for a third party of native English speakers to assess the participants' nativeness on the criteria mentioned above.

3.7.2. Oxford Placement Task

In the later online experiments 5 & 6 in this study the L2 participants had to take the grammar part of the Oxford Placement Test (OPT) in order to obtain a quantitative measure of their L2 proficiency, as some of these participants did not possess an academic degree in English Language and Culture. The grammar part of the OPT is a gap text/cloze test in English, where for each gap the participant has to choose the correct word or word combination out of three options. In total there are 100 gaps to fill. Most of the gaps deal with those linguistic structures that are subtle, difficult and acquired late by L2 learners, *e.g.* tense, article usage, prepositions and question tags and their exceptions as a result of certain interface phenomena (a.o. residual V2 word order). Participants who score between 75 and 84 correct out of 100 are diagnosed as having C1 level in their grammar according to CEFR standards. Those scoring between 85 and 94 as C2 level, 95-98 as near-native, and 99-100 as functionally bilingual. Native speakers of English were assigned a default value of 100.

The scores obtained from this proficiency test were used to filter out those participants who did not meet the advanced to near-native criteria. The remaining scores of the participants were then centred and added as a predictor in Linear Mixed Effects analyses (see Chapter 6).

3.8. Chapter summary

The methodologies adopted for research undertaken in this dissertation involved Magnitude Estimation Tasks, Syntactic Priming Tasks, Digit Recall Tasks, speeded Grammaticality Judgement Tasks, speeded Sentence Completion Tasks, three different free speech tasks and the Oxford Placement Test. The Magnitude Estimation Task was used as a more precise method in measuring participants' gradience in acceptability than Acceptability Judgement Tasks or Grammaticality Judgement Tasks for testing offline language comprehension amongst the participants, targeting their (meta)linguistic knowledge of lexical constraints on word order regarding possessive structures and residual V2. In addition, real-time access to this knowledge was tested via online Syntactic Priming Tasks, speeded Grammaticality Judgements Tasks and speeded Sentence Completion Tasks.

In the Syntactic Priming Task one could argue whether participants may still have enough time and memory resources to monitor their language production carefully. So an additional Syntactic Priming Task with an integrated Digit Recall Task was developed that took up the majority –if not all– of the participants' memory resources. Thereby preventing active monitoring of their utterances (*i.e.* promoting instant reactions to the sentence primes rather than carefully weighing their language production against prescriptive grammar rules). Another way to promote more 'natural' language production is to restrict the participants' time window in which they have to produce their utterances. This can be compared to a real-life situation: when a person is in a dialogue with someone else they cannot always control for the amount of time they can spend on producing utterances before they get interrupted. This concept of an added time limit to the speaker's language production was emulated in the speeded Sentence Completion Task. The difference from natural speech being here that participants were steered towards producing certain sentences as they had to complete a given utterance, and so to ensure preposed adverbials of manner were included in the participants' language production.

Online access to (meta)linguistic knowledge of lexical constraints on V2 word order was tested via speeded Grammaticality Judgement Tasks in our study. As opposed to the offline Magnitude Estimation Task, this task only requires the participant to make a binary decision: grammatical or ungrammatical. As the participants are subjected to considerable

time stress, this task can be interpreted as an online task since there is no time for them to monitor their decisions carefully. This is also the reason why simple binary grammaticality judgements rather than gradient magnitude estimations were expected from the participants as there would be not enough time for them to recalculate the numerical values given to each experimental item in reference to their modulus.

This study used several different tests for assessing L2 English proficiency of Dutch participants. In our first experiment, L2 proficiency among the Dutch learners of English was assessed by native speakers of English on six different criteria (see White & Genessee 1996). The native speakers had to assess speech samples taken from three different free speech tasks, *viz.* answering questions related to the experiment, answering open and scrupulous questions, and describing vague ambiguous images drawing on the participants' projective skills (Thematic Apperception Test: see Appendix H for the images). As these methods can only qualitatively determine the L2 learner's proficiency, another proficiency test –called the Oxford Placement Test– was used to test the L2 proficiency of Dutch L2 learners of English who were not students or graduates of a degree in English (i.e. the Dutch participants in experiments 5 & 6). This test is capable of quantifying participant's L2 proficiency, which, consequently, was added as a predictor in a Linear Mixed Effects Regression model.

Chapter 4 Possessive structures

4.1. Chapter overview

Following the discussion on gaps in recent research on near-nativeness and how to address these empirically by conducting experiments on specific linguistic structures (see Chapter 2), we present the results from offline and online experiments on possessive structures using the methodologies of magnitude estimation and syntactic priming (see Chapter 3). The experiments reported in this chapter examined whether Dutch near-native learners of English possess L2 knowledge of lexico-syntactic constraints and their exceptions on English possessives, and if they did whether they have access to this knowledge in online tasks. The results on L2 comprehension and production of English possessives were compared to L1 comprehension and production of these structures by native speakers of English who acted as a control group. The methods, results and analyses of these experiments are presented and the overall results are discussed and compared with each other at the end of this chapter.

4.2. Experiment 1: Magnitude Estimation Task

This experiment tests L1 speakers' and L2 learners' knowledge of lexico-syntactic constraints on English possessives in a timed comprehension task where the participants still had enough time to monitor their judgements (see Chapter 3 for an explanation of this method). The prediction is that as a result of L1 transfer L2ers will give higher ratings to postnominal genitive constructions with animate possessors than the L1ers.

4.2.1. Method

Participants

Three groups were tested:

i. An experimental group of 43 highly advanced adult Dutch learners of English (CEFR level C1 and above). These participants were recruited among BA, MA and PhD students of English or Linguistics at Utrecht University and Leiden University in the Netherlands (age range 19-45, mean age: 22.7, L2 onset age range: 5-12, mean L2 onset age: 9.1; see Appendix J for individual data).[13]

[13] Though some participants reported L2 onset age as early as 5 years old, after further questioning it became apparent that this was their first *L2 exposure* and not the onset of *formal L2 instruction*. The cut-off point for including late L2 learners was *8 years* of age, i.e. those who made clear they started formal L2 instruction after the age of 8 were included in the experimental group. Some participants reported having native English-speaking parents, but added they were not raised bilingually and only speak Dutch to them. These inclusion criteria remain true for all participants in the remainder of the experiments in this thesis. Linear model analyses confirm there was no main effect of: L2 onset age ($p=0.92$), having a native English speaking parent ($p=0.55$), having stayed in an English community for more than 6 months ($p=0.35$) or more than 3 years ($p=0.42$) on the L2 proficiency of the Dutch learners of English in this experimental group.

ii. A control group of 20 native speakers of English recruited among students of the University of Edinburgh (age range: 20-33, mean age: 23.8; see Appendix J for individual data).

iii. A control group of 22 native speakers of *ABN* Dutch recruited from the pre-final year classes of *VWO/Gymnasium* (= pre-academic) grammar schools at *Zandvliet College* in The Hague, the Netherlands (age range: 14-16, mean age: 15.3; see Appendix J for individual data).[14]

Materials

The materials were presented both in English and Dutch. The Dutch materials were only presented to the control group of native speakers of Dutch (group iii), the English materials were presented to the other two groups.

The possessive constructions under investigation consisted of:

a) an animate possessor and an inanimate possessum
   i) in which the animate possessor is <u>not</u> a proper noun
      – a prenominal *s*-genitive is predicted for English: the man's house
      – a postnominal *of*-genitive is predicted for Dutch: *het huis van de man* ('the house of the man'), though a prenominal possessive construction is possible: *de man zijn/z'n huis* ('the man his house')
   ii) in which the animate possessor is a proper noun
      – a prenominal *s*-genitive is predicted for English: John's house
      – optionality between a postnominal *of*-genitive and a prenominal *s/z'n*-genitive is predicted for Dutch: *het huis van Jan* ('the house of John') / *Jans huis* ('John's house') / *Jan z'n huis* ('John his house').

b) an animate possessor and an animate possessum
   i) in which the animate possessor is <u>not</u> a proper noun
      – a prenominal *s*-genitive is predicted for English: the man's wife
      – a postnominal *of*-genitive is predicted for Dutch: *de vrouw van de man* ('the wife of the man'), though a prenominal possessive construction is possible: *de man zijn/z'n vrouw* ('the man his wife')

[14] *ABN* = *Algemeen Beschaafd Nederlands* ('General Civilised Dutch'), the most wide-spread standard dialect spoken in the Netherlands. This group was included to control for Dutch behaviour on the specific possessive structures *in Dutch*.

ii) in which the animate possessor is a proper noun
   - a prenominal *s*-genitive is predicted for English: John's wife
   - optionality between a postnominal *of*-genitive and a prenominal *s/z'n*-genitive is predicted for Dutch: *de vrouw van Jan* ('the wife of John') / *Jans vrouw* ('John's wife') / *Jan z'n vrouw* ('John his wife')

The experimental design is a 2x2x2 design, in which three within-subjects factors with two levels each yield 8 conditions per language (see Table 4 below):

i) Genitive Type
   a) prenominal *s/z'n*-genitive (pre)
   b) postnominal *of/van*-genitive (post)
ii) Animate Possessor Type
   a) article + common noun (common)
   b) no article + proper noun (proper)
iii) Possessum Type
   a) inanimate (inan)
   b) animate (anim)

Table 4. Experimental conditions and examples of possessive structures in experiment 1

Condition	*English example*	*Dutch example*
A. pre, common, inan	*The president's plane*	*?De president(s / z'n) vliegtuig*
B. post, common, inan	*?The plane of the president*	*Het vliegtuig van de president*
C. pre, proper, inan	*John's plane*	*Jan(s / z'n) vliegtuig*
D. post, proper, inan	**The plane of John*	*?Het vliegtuig van Jan*
E. pre, common, anim	*The King's bodyguard*	*?De koning(s / z'n) bodyguard*
F. post, common, anim	*?The bodyguard of the king*	*De bodyguard van de koning*
G. pre, proper, anim	*Henry's bodyguard*	*?Willem(s / z'n) bodyguard*
H. post, proper, anim	**The bodyguard of Henry*	*De bodyguard van Willem*

In order to avoid a bias in genitive selection the possessive constructions only contained possessor nouns that did not end in a sibilant (/s/, /z/) or /θ/ sound, as it has been shown that *s*-genitives are avoided in these phonetic environments (Quirk et al., 1985). Half of the possessive constructions were presented in subject position (63), the other half in object position (64), in an otherwise fully grammatical sentence (examples below). In the Dutch experiment, half of the prenominal genitives were *s*-genitives (65), and the other half *z'n*-genitives (66). Note that these prenominal genitive constructions are interchangeable.

63) **The president's plane** was damaged during its first flight.

64) My father punished **the plumber's son** for the damage.

65) ***De presidents vliegtuig*** *was beschadigd tijdens de eerste vlucht.*

66) *Mijn vader strafte* ***de loodgieter z'n zoon*** *voor de schade.*

There are four lexicalizations per condition, thus thirty-two experimental items in total, and an additional twenty-eight filler items varying in grammaticality. The number of words (word count) and characters (sentence length) of these items were controlled for, as well as the word length and frequency of the common noun possessors and possessums inside the genitival constructions.[15] Post-hoc *t*-tests confirmed there are no significant differences between the different conditions with respect to word count and sentence length of the experimental items (all p values $\geq$ 0.03, Bonferroni corrected critical p value is 0.0125) and with respect to word length and frequency of the common noun possessors and possessums (all p values > 0.2, see Appendix A for all statistics and exact p values).

The experimental items were presented one at a time along with one and the same reference sentence (67), a sentence that was given a numerical value by the participant according to the magnitude estimation protocol explained in the previous chapter.

67) In our scouting club he is the youngest, brave, and new member.

This sentence was purposefully neither fully grammatical, nor fully unacceptable, but marginally acceptable, as participants were asked to rate sentences either more acceptable or less acceptable than this sentence. See Appendix A for all experimental items in this experiment.

Procedure

At the offset of all experiments reported in this thesis, participants were informed about their rights and were asked to sign a consent form (see Appendix I). After instruction of the task and a calibration session with line length judgements and sentence judgements, the participants were presented with a timed PowerPoint® presentation that was projected via a beamer onto the wall in a classroom setting. The experimental sentence –with the reference sentence underneath– appeared on a slide and was presented for six seconds until it moved on to the next slide. A pilot study showed that the six second interval is not too strenuous for participants as they still had just enough time to make a decision. Thus, this method of

[15] Frequency was determined by choosing the log option in WebCelex (2001) which uses the COBUILD corpus for English and the INL corpus for Dutch.

presentation can be interpreted as an 'offline' task in which participants' judgements are still bound to be their first impressions.

The sentences to be judged were horizontally and vertically centred in the middle of the screen. The font used to present the experimental sentences was Arial size 32, and for the reference sentence Arial size 20, though the sentences appeared magnified on the wall because of the projector set-up. In total sixty sentences –containing 32 experimental items over 8 conditions and 28 filler items– were judged in relation to one reference sentence. The sentences were presented in a pseudo-randomised list, in which it was made sure no items of the same experimental condition followed one another. The sixty items were randomised and distributed onto four lists. The magnitude estimations had to be filled in on a printed answer sheet; and biographical data such as age, education, knowledge of other languages *etc.* were collected afterwards by means of a brief questionnaire (see Appendix I).

Analysis

The participants' magnitude estimation values were divided by their self-chosen moduli and then log-transformed and standardized in order to obtain *z*-scores. This standardisation procedure was necessary in order to transform the data into normally distributed data, so that parametric statistical analyses like *t*-tests are possible on the data. As the dependent variable, a magnitude estimation judgement on a continuous scale, is not dichotomous, and the data is normally distributed after standardisation, Linear Mixed Effects Regression (LMER) and *t*-tests were used for the statistical analyses. We chose to adopt LMER to analyse the data instead of the more traditional ANOVAs as this method has proved to be more robust (significant less chances of Type I and Type II errors) and handles fixed and crossed random effects in a more efficient way, i.e. not having to combine separate by-subjects and by-items analyses in quasi F-tests, but simply use one model to analyse all factors (Baayen et al 2008, Winter 2011 *inter alia*). However, LMER analyses do not report degrees of freedom, as this is "not a meaningful concept for linear mixed effects models":

> In real-world studies the data often end up unbalanced, especially in observational studies but even in designed experiments where missing data can and do occur, and the models can be quite complicated. The simple formulas for the degrees of freedom for inferences based on t or F-distributions do not apply in such cases. In fact, the pivotal quantities for such hypothesis tests do not even have t or F-distributions in such cases so trying to determine the "correct" value of the degrees of freedom to apply is meaningless.
>
> (Baayen et al 2008: 396)

So in order to estimate p values, we adopted Markov-Chain Monte Carlo (MCMC) sampling with 10000 simulations, using the pvals.fnc() function implemented in the R package *lme4* (Bates & Maechler 2009), to obtain so-called MCMC-estimated p values. This protocol was applied to all mixed effects modeling in this thesis where possible (*i.e.* in models with uncrossed random effects), including the logistic mixed effects regression models in the later priming experiments.

4.2.2. Results

The descriptive data in Table 5 illustrate that animate possessors are more preferred inside prenominal genitives (μ=0.66 for common nouns, μ=0.63 for proper nouns) than postnominal genitives (μ=0.46 for common nouns, μ=0.24 for proper nouns).

Table 5. Mean *z*-scores of possessive structures in different conditions for all groups

Genitive Type	***Animate Possessor Type***	***Possessum Type***	***Mean***	***SD***
Prenominal	Common noun	Inanimate	0.5603	0.83089
		Animate	0.6598	0.78737
	Proper noun	Inanimate	0.7390	0.85460
		Animate	0.6346	0.85753
Postnominal	Common noun	Inanimate	0.2879	0.97391
		Animate	0.4643	0.79828
	Proper noun	Inanimate	0.0520	1.06941
		Animate	0.2391	0.99681

The three-factorial design (Genitive Type*Animate Possessor Type*Possessum Type) is first analysed with a Linear Mixed Effects Regression Model (LMER) in R, where Genitive Type, Animate Possessor Type and Possessum Type are fixed factors, and Participant and Item in this experiment the random factors.[16] There were different participants within each language group, but they were all tested on the same items. So the grouping structure demands participants to be subdivided into groups (Group/Participant). The dependent variable in this model is the standardized mean *z*-score. The following R command was used to check for interactions between the fixed factors and to fit the LMER model to the data (see Table 6 for results):

```
fit <- lmer(Mean_z ~ GenType * AnPossrType * PossmType + (1|Group/Participant) + (1|Item), data=d)
```

[16] The independent variables in this model were *not* centred as they were all binary/categorical. Only where independent variables are continuous is it necessary to centre these variables. The reason for this is that in the case of continuous data one is comparing with the overall grand mean value, but in the case of binary data one is only interested in a general difference. Some of the LMER analyses in this thesis contain continuous independent variables and these are centred subsequently.

Table 6. LMER analysis of the fitted model

	Estimate	Std. Error	t value	p value
(Intercept)	0.57507	0.19316	2.977	0.0030
GenType	-0.27244	0.13247	-2.057	0.0401
AnPossrType	0.17872	0.13247	1.349	0.1777
PossmType	0.09948	0.13247	0.751	0.4529
GenType*AnPossrType	-0.41462	0.18734	-2.213	0.0272
GenType*PossmType	0.07698	0.18734	0.411	0.6813
AnPossrType*PossmType	-0.20396	0.18734	-1.089	0.2767
GenType*AnPossrType*PossmType	0.21466	0.26494	0.810	0.4181

The AIC, BIC and logLik values for this model were 1165, 1219 and -570.3 respectively.

The LMER analysis reveals a significant main effect of Genitive Type (p=0.040) and a significant Genitive Type*Animate Possessor Type interaction (p=0.027), meaning that in this experiment the ratings for certain genitive constructions (prenominal or postnominal) were co-determined by the animacy of the possessor noun. More specifically, prenominal genitives with an animate possessor were rated higher than prenominal genitives with an inanimate possessor among all three groups.

Paired-sample *t*-tests confirm that prenominal genitives with animate common noun possessors received higher acceptability ratings than postnominal genitives with animate common noun possessors: t(84)=3.105 (p=0.003) for inanimate possesums and t(84)=3.350 (p=0.001) for animate possessums. In addition, prenominal genitives with animate proper noun possessors also received higher acceptability ratings than postnominal genitives with animate proper nouns possessors: t(84)=7.804 (p<0.001) for inanimate possessums and t(84)=5.412 (p<0.001) for animate possessums. After Bonferroni correction –adjusting the critical value from 0.05 to 0.0125– all paired-sample *t*-tests still indicate that there are significant preferences for animate possessors inside prenominal genitives than inside postnominal genitives.

A second LMER model almost identical to the one described above was applied to the data, with the only difference that language group was now factored in as a fixed factor in this model. This was done in order to draw comparisons in preferences across the different conditions *between* language groups (see fitted model + Table 7 below).

```
fit <- lmer(Mean_z ~ GenType * AnPossrType * PossmType * Group + (1|Group/Participant) + (1|Item), data=d)
```

Table 7. LMER analysis of the fitted model

	Estimate	*Std. Error*	*t value*	*p value*
(Intercept)	0.67661	0.20381	3.320	0.0010
GenType	0.20859	0.16301	1.280	0.2011
AnPossrType	0.18318	0.16301	1.124	0.2615
PossmType	0.18697	0.16301	1.147	0.2518
Group	-0.20004	0.23578	-0.848	0.3965
GenType*AnPossrType	-0.32219	0.23052	-1.398	0.1627
GenType*PossmType	-0.17432	0.23052	-0.756	0.4498
AnPossrType*PossmType	-0.22625	0.23052	-0.981	0.3267
GenType*Group	-0.43315	0.15422	-2.809	0.0051
AnPossrType*Group	0.01848	0.15422	0.120	0.9047
PossmType*Group	-0.07417	0.15422	-0.481	0.6307
GenType*AnPossrType*PossmType	0.24950	0.32601	0.765	0.4444
GenType*AnPossrType*Group	-0.11725	0.21810	-0.538	0.5910
GenType*PossmType*Group	0.14827	0.21810	0.680	0.4968
AnPossrType*PossmType*Group	-0.04261	0.21810	-0.195	0.8452
GenType*AnPossrType*PossmType*Group	0.06436	0.30843	0.209	0.8348

The AIC, BIC and logLik values for this model were 1118, 1245 and -531 respectively.

The analysis reveals a highly significant Genitive Type*Group interaction (p=0.0051). This interaction can be explained by the significant difference in mean *z*-scores for postnominal genitives among the native speakers of English in English and the Dutch learners of English in English and native speakers of Dutch in Dutch (see Figure 8 below), where the native speakers of English significantly dispreferred animate possessor nouns (especially proper nouns) in a postnominal genitive construction compared to the Dutch group. Comparing the mean *z*-scores on postnominal genitives between native speakers of Dutch on Dutch and native speakers of English in English reveals a highly significant difference ($t(41)=4.534$, $p<0.001$), i.e. native speakers of Dutch rated this structure significantly more acceptable in Dutch than native speakers of English did in English (see Table 8 below). Comparing the mean *z*-scores on postnominal genitives between native speakers of Dutch on Dutch (group 0; $\mu=0.83$, $SD=0.82$) and Dutch L2 learners of English also revealed that the Dutch L1ers prefer postnominal genitives in Dutch more than the Dutch L2ers in English ($t(64)=2.956$, $p=0.004$).

Table 8. Mean *z*-scores of postnominal genitives per group

Group	*Mean*	*SD*
Dutch L1ers on Dutch	0.8278	0.82434
Dutch L2ers on English	0.1878	0.95574
English L1ers on English	-0.2057	0.85774

Figure 8 also illustrates that the Dutch native speakers' preferences on Dutch genitive constructions are equally distributed among all experimental conditions, i.e. they do not show a clear general preference for one genitive structure over the other as the English and Dutch L2 learners of English *on English* do (prenominal genitives > postnominal genitives).

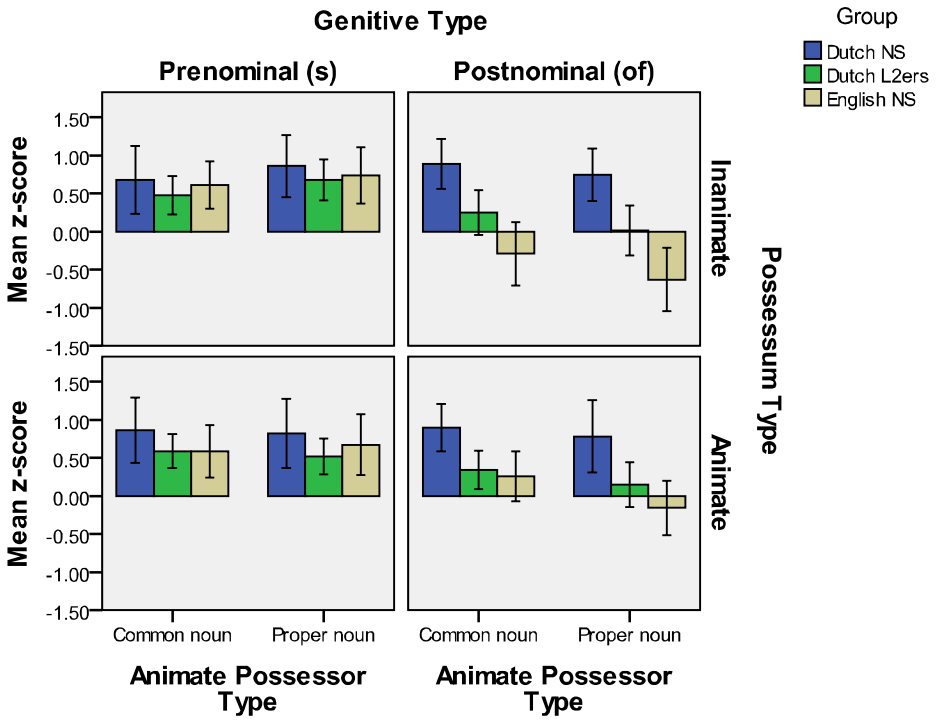


Figure 8. Mean z-scores of possessive structures per condition (error bars: 95% CI)

Since the main interest of this study is the difference in acceptance of English postnominal genitives containing animate possessors between highly advanced Dutch L2 learners of English and native speakers of English, the next section focuses on these two groups specifically.

Dutch L2 learners of English compared to English native speakers

The descriptive statistics in Table 9 report the mean *z* scores (and their standard deviations) of the magnitude estimations per experimental condition by the highly advanced Dutch L2 learners of English and native speakers of English.

Table 9. Descriptive statistics of mean *z* scores per condition per language group

Group	*Genitive Type*	*Possessor Type*	*Possessum Type*	*Mean*	*SD*
Dutch L2ers	Prenominal	Common noun	Inanimate	0.4766	0.8117
			Animate	0.5894	0.7128
		Proper noun	Inanimate	0.6782	0.8617
			Animate	0.5222	0.7640
	Postnominal	Common noun	Inanimate	0.2520	0.9603
			Animate	0.3388	0.8207
		Proper noun	Inanimate	0.0142	1.0717
			Animate	0.1460	0.9563
English L1ers	Prenominal	Common noun	Inanimate	0.6125	0.6590
			Animate	0.5871	0.7323
		Proper noun	Inanimate	0.7370	0.7914
			Animate	0.6717	0.8537
	Postnominal	Common noun	Inanimate	-0.2921	0.8832
			Animate	0.2575	0.6935
		Proper noun	Inanimate	-0.6305	0.8867
			Animate	-0.1578	0.7653

The exact same LMER model as the one reported in the previous section was run on the Dutch L2 and English L1 data (i.e. the mean *z* scores of native Dutch speakers on Dutch were excluded). The formula and results of the LMER analysis are reported below.

```
fit <- lmer(Mean_z ~ GenType * AnPossrType * PossmType + (1|Group/Participant) + (1|Item), data=d)
```

Table 10. LMER analysis of the fitted model

	Estimate	Std. Error	t value	p value
(Intercept)	0.51971	0.14280	3.640	0.0003
GenType	-0.44042	0.15498	-2.842	0.0047
AnPossrType	0.17716	0.15498	1.143	0.2535
PossmType	0.06893	0.15498	0.445	0.6567
GenType*AnPossrType	-0.44690	0.21917	-2.039	0.0420
GenType*PossmType	0.16474	0.21917	0.752	0.4526
AnPossrType*PossmType	-0.19617	0.21917	-0.895	0.3712
GenType*AnPossrType*PossmType	0.20249	0.30996	0.653	0.5139

The AIC, BIC and logLik values for this model were 872.1, 922.8 and -424.1 respectively.

Table 10 confirms a significant main effect of Genitive Type (p=0.0047). The significant main effect of Genitive Type can be explained by the fact that both Dutch L2ers and English NSs preferred prenominal genitives significantly more than postnominal genitives across all conditions (see Figure 8 and Table 9). This finding is confirmed by a paired samples *t*-test: $t(62)=3.771$ ($p<0.001$). Separate *t*-tests for the Dutch L2ers:

t(42)=2.1567 (p=0.034), and the English NSs: *t*(19)=3.7877 (p<0.001) confirmed these groups' preferences of prenominal genitives over postnominal genitives in English.

Table 10 also reveals a Genitive Type*Animate Possessor Type interaction (p=0.042). Follow-up *t*-tests show that both Dutch L2ers and English L1ers prefer animate proper nouns inside prenominal genitives (*John's house*) significantly more than postnominal genitives with animate proper nouns (?*the house of John*): *t*(62)=4.557 (p<0.001), as well as animate common nouns inside prenominal genitives (*the man's house*) significantly more than postnominal genitives with animate common nouns (?*the house of the man*): *t*(62)=2.614 (p=0.001).

A second LMER model similar to the one above but with Group factored in as a separate fixed effect was run on the data in order to check for interactions with language group:

```
fit <- lmer(Mean_z ~ GenType * AnPossrType * PossmType * Group + (1|Group/Participant) + (1|Item), data=d)
```

Table 11. LMER analysis of the fitted model

	Estimate	***Std. Error***	***t value***	***p value***
(Intercept)	0.47657	0.16361	2.913	0.0037
GenType	-0.22456	0.15724	-1.428	0.1539
AnPossrType	0.20166	0.15724	1.283	0.2003
PossmType	0.11279	0.15724	0.717	0.4735
Group	0.13589	0.23854	0.570	0.5692
GenType*AnPossrType	-0.43944	0.22237	-1.976	0.0487
GenType*PossmType	-0.02605	0.22237	-0.117	0.9068
AnPossrType*PossmType	-0.26886	0.22237	-1.209	0.2272
GenType*Group	-0.67996	0.16618	-4.092	0.0001
AnPossrType*Group	-0.07716	0.16618	-0.464	0.6426
PossmType*Group	-0.13817	0.16618	-0.831	0.4061
GenType*AnPossrType*PossmType	0.31387	0.31448	0.998	0.3187
GenType*AnPossrType*Group	-0.02353	0.23501	-0.100	0.9203
GenType*PossmType*Group	0.60100	0.23501	2.557	0.0109
AnPossrType*PossmType*Group	0.22899	0.23501	0.974	0.3304
GenType*AnPossrType*PossmType*Group	-0.35084	0.33236	-1.056	0.2917

The AIC, BIC and logLik values for this model were 857.6, 942.1 and -408.8 respectively.

The LMER analysis revealed a highly significant Genitive Type*Group interaction (p<0.001) and a significant Genitive Type*Possessum Type*Group interaction (p=0.011). These interactions confirm that the Dutch L2ers rated certain English genitive constructions generally different than the native speakers of English. Follow-up t-tests revealed that this difference is to be attributed to the ratings of certain postnominal genitives in English. That is, the Dutch L2 learners of English gave significantly higher ratings to postnominal

genitives consisting of animate possessors and inanimate possessums than the native speakers of English (see top right graph in figure 8). This was true for those possessive constructions with a common noun possessor, *e.g. the house of the man*: (t(62)=2.145, p=0.036), as well as those with a proper noun possessor, *e.g. the house of John*: (t(62)=2.341, p=0.023).

Collapsing across the different possessor noun types, the main factor influencing acceptability ratings of postnominal genitives *amongst English L1ers* is possessum animacy, *viz*. postnominal genitives with inanimate possessums were rated significantly lower than postnominal genitives with animate possessums among the English L1ers (t(19)=-4.87, p<0.001), whereas Dutch L2 acceptance ratings showed less marked differences between animate and inanimate possessums in postnominal genitive constructions (see Figure 8).

In sum, the most important finding of this experiment is that Dutch L2 learners of English rate postnominal genitives with animate possessors, which is a marked structure in English, significantly higher than native speakers of English. Animate Possessor Type (common noun vs proper noun) and Group (Dutch L2ers vs English native speakers) are marginal predictors for the magnitude estimation of sentences containing prenominal and postnominal genitives. A scatterplot, Figure 9 below, where the data is split by language groups (1=Dutch L2ers, 2=English NSs) confirms this finding, as one can see the slopes are not converging for the different groups (*i.e.* random slopes are significantly different from each other). The discussion below provides interpretations of the statistical data presented in this section.

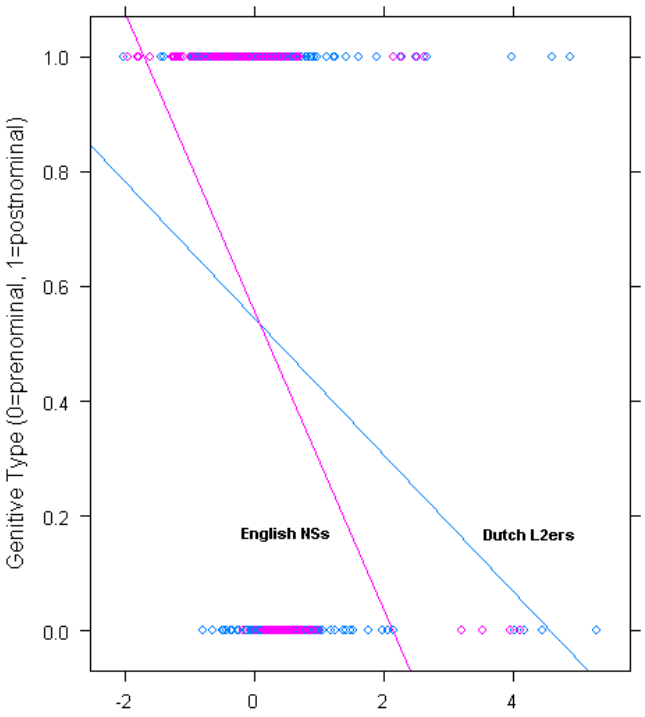


Figure 9. Mean z-scores for genitive types by group

4.2.3. Discussion

The data analyses revealed that all groups gave significantly higher acceptability ratings to animate possessor nouns in prenominal genitives than in postnominal genitives (consistent with English prescriptive grammar, see Table 5 and Figure 8). From the statistical analyses it appeared that possessor animacy is a strong predictor for the type of genitive selected for possessive constructions.

Excluding the Dutch NS group on Dutch data, both Dutch L2ers and English NSs showed a significant preference for prenominal genitives in English. This is not surprising for the latter group as prenominal genitives occur more frequently in English. That is, English NSs may be biased in choosing prenominal genitives over postnominal genitives due to a lexical frequency effect. However, in Dutch, postnominal genitives are much more frequent than prenominal genitives (see literature review in Chapter 2), so the preference of prenominal genitives over postnominal genitives in L2 English cannot be attributed to an L1 effect. It could, however, stem from explicit linguistic knowledge, or be a consequence of more exposure to this structure in L2 English.

The inferential statistics reveal that Dutch L2ers rated all possible English genitive constructions more acceptable than the English NSs did. This could be a residual effect of L1 optionality in Dutch genitive constructions by the Dutch L2ers. As described in Chapter 2, in Dutch certain genitives do not necessarily call for a preference of a specific construction (though postnominal genitives may be more lexically frequent, the prenominal genivite alternative is not ungrammatical; hence the optionality here). This optionality could influence Dutch L2ers to be more lenient on their genitive preferences in L2 English on the whole (and perhaps in other languages as well). In English, there is a stronger border line when to adopt prenominal genitives and when to adopt postnominal genitives, and as such English NSs may be stricter in their acceptance of genitive constructions on the whole.

As Figure 8 illustrates, prenominal genitives with animate noun possessors are more preferred by all groups than the other possible genitive combinations. However, when postnominal genitives had to be rated, acceptability scores on these constructions with common nouns were significantly higher than those for proper nouns. An explanation for this preference is that proper nouns are often associated with animate entities, either in the possessum position, *e.g.* London's Bobbies, or in the possessor position, *e.g.* John's bike. A postnominal genitive associated with animacy, i.e an animate possessum or possessor, is most of the times dispreferred or even ungrammatical in English, *e.g.* *the Bobbies of London, *the bike of John. This is why common nouns, which are more readily associated with inanimate entities, are judged more acceptable in postnominal genitives by Dutch L2ers

and English NSs than postnominal genitives containing proper nouns. Moreover, proper nouns most commonly refer to discourse-old entities. According to the "old-before-new principle", proper nouns are then to be expected to precede new material, *i.e.* occur prenominally.

In the results section a significant Genitive Type*Group interaction was found. Follow-up *t*-tests showed that the most important distinction in genitive preference between language groups was that Dutch L2ers rated postnominal genitives in English significantly more acceptable than English L1ers. Note that in the descriptive statistics the Dutch L2ers' mean log-transformed *z*-score is a positive value, meaning that the Dutch learners of English rated the postnominal genitive construction as more 'correct-sounding' than the modulus, whereas the English NSs' mean log-transformed *z*-score is a negative value, implying that this group considers the postnominal genitive construction in general to sound worse than the modulus adopted for this experiment.

4.2.4. Conclusion

This study reveals that in most contexts advanced Dutch learners of English behave like English native speakers regarding their preferences of genitive structures in comprehension. The most important discovery is that Dutch L2ers and English native speakers rate prenominal genitives the same, but postnominal genitives differently, with the L2ers accepting postnominal genitives more in English than the L1ers. The higher mean acceptability rate of postnominal genitives can be attributed to an L1 effect as Dutch learners of English overextended the use of *of*-genitives in their L2 English to those contexts in which these structures are licensed in Dutch but not in English. So the prediction regarding postnominal genitive ratings at the start of the experiment was borne out.

The next step is to compare the offline data from this experiment with online data and to examine differences in online processing between advanced Dutch learners of English and native speakers of English. In addition to this, we will examine differences between comprehension and production of genitive structures amongst both L1 and L2 speakers of English in the next experiment (experiment 2). Experiment 1 shows that advanced Dutch learners of English and native speakers of English behave almost similarly with respect to prenominal genitives in their comprehension. However, online tasks will cause an increase in processing costs due to the nature of the task and subsequently L2 learners' resources (fluency, memory *etc.*) could be more effected by this increase than L1 speakers in such a way that significant differences might arise between offline and online genitive comprehension and production. Therefore, the next experiment, a Syntactic Priming Task,

examines whether the offline differences in postnominal genitive acceptability ratings in this experiment are mirrored in an online production task. The outcome of this sheds more light on an explanation of where the non-convergence between L1 and L2 genitive comprehension and production comes from, *e.g.* whether the acceptability and potential overextended use of postnominal genitives is the result of underspecification of grammatical L2 knowledge or of a processing deficit.

4.3. Experiment 2: Syntactic Priming Task

This experiment tests online access to knowledge of lexico-syntactic constraints on English possessive structures among L1 and L2 speakers of English in a syntactic priming task (see Chapter 3 for an explanation of this method). The prediction is that Dutch L2 learners of English will be primed into producing more postnominal genitive constructions with animate possessors and possessums than the native speakers of English.

4.3.1. Method

Participants

The following groups were tested:

i. An experimental group of 24 very advanced Dutch learners of English (age range: 23-64, mean age: 37.6, L2 onset age range: 9-12, mean L2 onset age: 11.1; see Appendix J for individual data).[17] The participants were language teachers, lecturers, post-docs or PhD students from the English departments at Leiden and Utrecht University, and were all subjected to a semi-spontaneous structured interview in which their L2 production was recorded and consequently assessed on near-nativeness by native speakers of English (see criteria White & Genessee 1996 and Appendix H). From these recordings native speakers of English judged:
   a. 12 participants to be near-native (*i.e.* indistinguishable from natives);
   b. 12 participants to be advanced L2ers (*i.e.* distinguishable from natives).

[17] In terms of L2 proficiency the L2 participants in this experiment were comparable to those in experiment 1 (both CEFR level C1 and above). Some of the L2 participants reported to have parents who do not have Dutch as their native language. However, statistical analyses show this did not have a significant effect on their L2 proficiency ($p=0.75$). In addition, some L2 participants reported to have spent more than 6 months, or more than 3 years, in an English-speaking community. This also did not have a significant effect on L2 proficiency ($p = 0.19$ for > 6 months, $p = 0.20$ for > 3 years). The age range of the L2 participants in this experiment is relatively wide compared to the participants from experiment 1, but the participants in both experiments have similar socioeconomic statuses and L2 proficiencies, and hence are comparable with another.

ii. A control group of 24 native speakers of English (age range: 17-31, mean age: 23.5; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University, who had not participated in any of the previous experiments.

Materials

The design of this experiment is a simplified version of the experimental design of experiment 1. Instead of a 2x2x2 design, this experiment consisted of a mixed 2x2 design, comprising of a within-participants factor Prime Type (prenominal genitive vs postnominal genitive) and a between-participants factor Group (Dutch L2ers vs English NSs). There were sixteen experimental prime-target pairs containing a prime sentence with either a prenominal or a postnominal genitive and a corresponding picture followed by a target scene. These scenes contained easy-to-recognise animals and human beings in a stereotypical vocation and were in a property relationship with one another illustrated by means of a visual marker. That is, a framed image of an animal belonged to the unframed image of a person.

All of the possessive structures appeared in object position in the prime sentences; half of these constructions were prenominal genitives (68) and the other half postnominal (69). The experimental genitive constructions consisted of animate possessors and animate possessums.

68) There goes the soldier's dog.
69) *There goes the dog of the soldier.

An additional eighty filler items varying in grammaticality were added to the item pool: twenty of them were sentences containing modified noun phrases (70), twenty of them were sentences containing numerals followed by plural nouns (71), twenty of them were sentences describing objects with respect to location (72), and twenty of them were sentences that expressed recommendations (73):

70) This is the graceful ballerina.
71) There are five pencils.
72) Two airplanes are flying in the sky.
73) In case of emergency wear a life vest.

The experimental items were controlled for sentence length and number of words *within* the experimental conditions: $\mu=27,\sigma=2.47$ for sentence length and $\mu=5,\sigma=0$ for number of words in the prenominal condition, $\mu=32,\sigma=2.47$ for sentence length and $\mu=7,\sigma=0$ for number of words in the postnominal condition (see Appendix B). One-sample *t*-tests confirm that the sentence lengths and number of words of the individual items *within* the experimental conditions did not differ significantly from the average sentence lengths and number of words within the prenominal and postnominal conditions (both $t(15)=0$, $p=1$). However, sentence length and number of words *between* the experimental conditions could not be controlled for as the nature of postnominal genitive constructions imposes consistently longer sentences than its prenominal equivalents (2 more words, *viz*. 'of' and 'the'; see Appendix B for statistics). We feel this difference should not impact the participants' responses significantly as the difference in number of characters between the experimental conditions is only minimal (5 characters, 15% of sentence length).

The common nouns used as possessors in both prenominal and postnominal conditions were controlled for word length and frequency (as determined by the COBUILD corpus for English, and INL corpus for Dutch). A paired samples t-test confirms there were no significant differences in the word length ($p=0.06$) and frequency ($p=0.71$) in the common noun possessors *between* the experimental conditions. See Appendix B for all experimental items and their statistics.

Procedure

The participants in this experiment first had to read and sign a consent form in which it was made clear that: a) they were participating voluntary and had the right to discontinue the experiment, b) elicited material may be discarded upon their discretion, and c) their data was made anonymous and would be treated with the greatest confidentiality (see Appendix I). The participants were informed that their reactions were recorded and transcribed for the purposes of the experiment. The participants' L2 production was recorded with a headset connected to the laptop as well as with a stand-alone Zoom 2 digital voice recorder throughout the experiment.

Postnominal genitives with animate possessors were primed and tested via a computerised Syntactic Priming Task designed in E-prime 2.0. This computer task consisted of two interrelated subtasks: 1) a Sentence-Picture Matching Task, and 2) a Picture Description Task. In the first task participants had to read out loud a phrase that appeared for four seconds in the middle of the computer screen (this was either a prime or a filler item) and then were shown a configuration of pictures that either matched the phrase read out loud

or not. Participants had to type in a 'y' for 'yes', or an 'n' for 'no' to indicate whether the phrase and subsequent picture matched. The computer programme waited for input before proceeding to the second subtask. After the matching task, another configuration of pictures appeared on screen, and participants were expected to describe the scene out loud within four seconds, thereby producing the primed target construction or not (see below for an example). They were instructed that speed is of the essence in the experiment and that they should not linger in producing their responses, but follow their instinctive reactions.

The prime-target pairs consisted of highly lexical frequent images portraying easy-to-recognise animals (*e.g.* dog, cat, horse) and human beings in a stereotypical vocation (*e.g.* doctor, policeman, fireman). The Syntactic Priming Tasks in this study adopted Gramacy's (2006) method for marking possessive relationships between two animate entities. The participants were instructed that when a picture of an element was framed this meant it belonged to the other unframed one in the scene. Subsequently this L2 production task establishes a possessive relationship between animate entities, *i.e.* an animal belonging to a person, and thereby eliciting production of genitive constructions –whether it is the primed construction or not. Half of the possessums in the prime-target pairs were depicted on the left-hand side of the computer screen (see Figure 10 below) and the other half on the right-hand side, so that participants could not associate the position of the possessum with a particular type of possessive description. In addition, half of the prime descriptions matched the presented pictures and half of them did not.

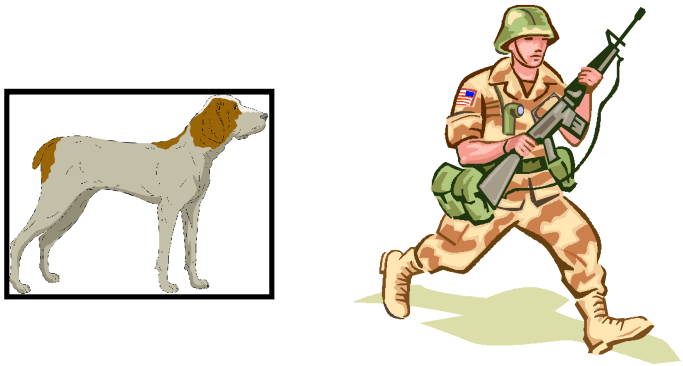
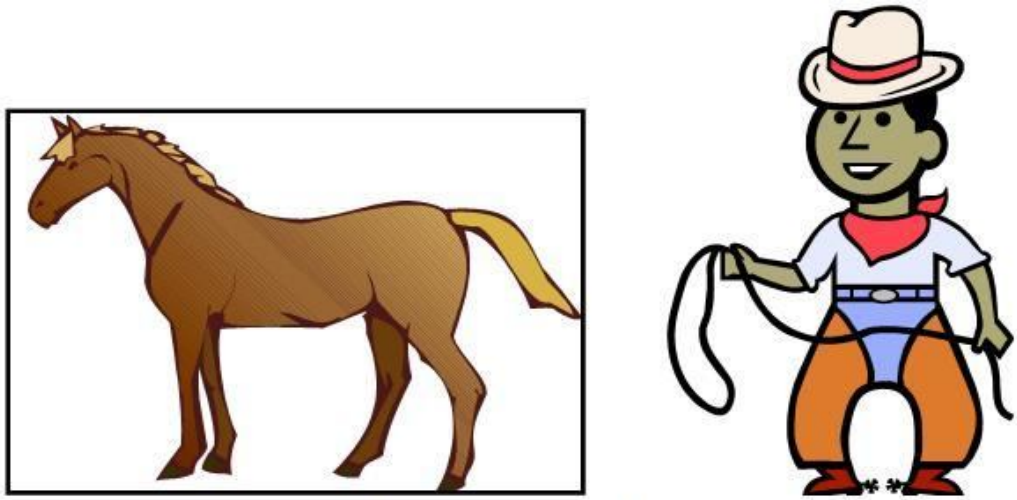


Figure 10. Possessive relationship where the framed entity indicates the possessum (target structures: The soldier's dog / *The dog of the soldier)

The experimental and filler items were combined into prime-target pairs such that neither the prime sentence with matching picture nor the target sequence with matching picture where repeated in either a target sequence or a prime sequence. The prime-target pairs were randomised and presented only once to the participants in four blocks. The

participants were first subjected to a practice session of six item pairs before the experiment started. See Figure 11 below for an example prime-target pair.

Prime sentence (read out loud): **There goes the horse of the cowboy.**



Question: **Yes or No?**

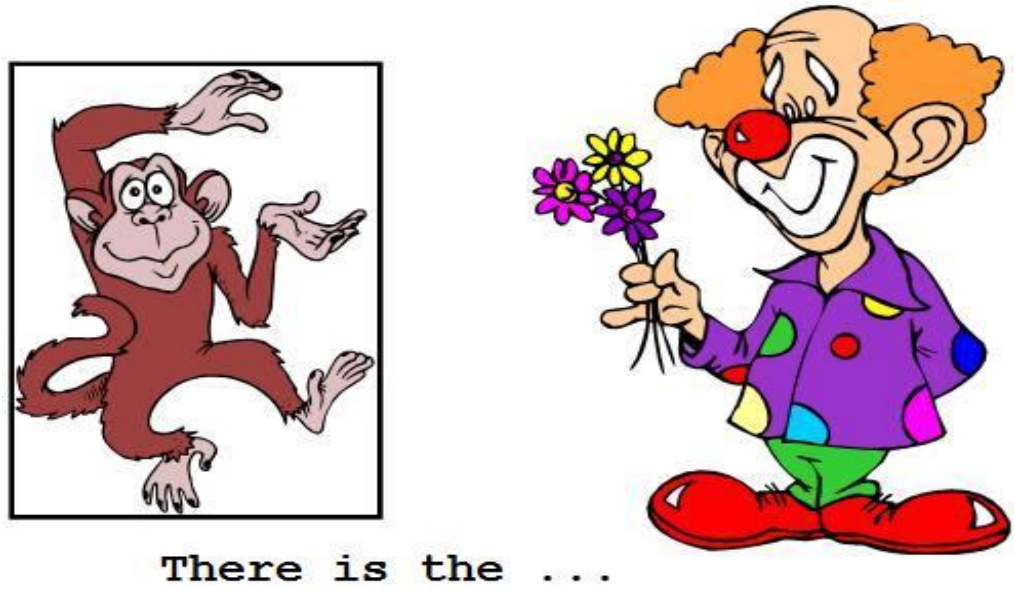


Figure 11. Example of a prime-target pair with the prime in the Sentence-Picture Matching Task (above) and where the target is elicited in the Picture Description Task (below).

After the computerised Syntactic Priming Task, participants were asked to answer three questions with respect to the priming task followed by two free speech tasks. The three questions asked were already mentioned in section 3.7.1. and are repeated below:

i) Could you describe what you have just done in this experiment?
ii) Could you expand on that answer?
iii) What do you think was the purpose of this experiment?

Participants were then recorded in a Thematic Apperception Test and answering open and scrupulous questions, to which the participants could not simply answer 'yes' or 'no', but had to provide an intricately motivated answer (see Appendix H for these materials).

Analysis

The data elicited in the Syntactic Priming Task were analysed with a Logistic Mixed Effects Regression (LMER) analysis, as this statistical analysis is more precise in dealing with mixed effects (F1 and F2 values in ANOVAs) and dichotomous dependent variables (i.e. whether a structure was primed or not). In addition, subsets of the L2 data based on participants' L2 proficiency (qualitatively measured via White & Genessee's 1996 criteria) were selected for separate analyses, as this would clarify the effect of participants' L2 proficiency on primeability of the critical possessive structures. Furthermore, participants' awareness of the purpose of the experiment was taken into account as a factor that might have had influence on primeability (awareness was gauged by the participants' answers to the questions regarding the priming task after the experiment).

Scoring

If it turned out participants were not paying attention to the presented materials, *i.e.* answer more than 25% of the picture-phrase matching questions incorrectly, then the subsequent L2 productions after the prime were not scored and discarded from the data set. If participants corrected their L2 productions, it was the first production (including incomplete utterances) that was analysed in the data analysis, since we are interested in the first automatic response that underlies online L2 performance at the syntax-lexicon interface.

4.3.2. Results

None of the participants from the experimental and control group were excluded in the general LMER analysis, as participants in both groups were successful in answering more than 75% correct of the sentence-picture matching questions (the lowest score was 83.3%

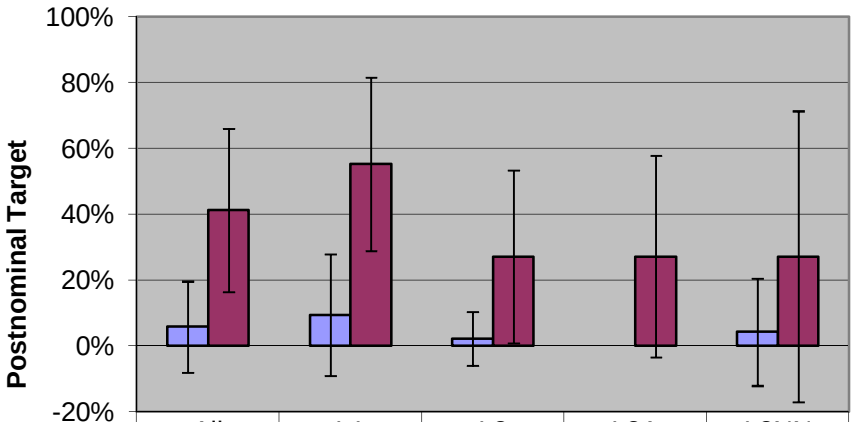
correct by participants in both groups). The results reported here pertain to all 48 participants tested. Subsequent sections will go into more detail about subgroups of this general group. Table 12 below shows the frequencies and percentages of target responses according to prime for: i) all participants (N=48), ii) the native speakers of English (L1: N=24), iii) the Dutch learners of English (L2: N=24), subsequently divided into iiia) advanced Dutch learners of English (L2A: N=12) and iiib) Dutch near-native speakers of English (L2NN: N=12).

Table 12. Target frequencies and percentages according to prime for all groups

	Prenominal target					**Postnominal target*				
Prime	***All***	***L1***	***L2***	***L2A***	***L2NN***	***All***	***L1***	***L2***	***L2A***	***L2NN***
Pre-	***170***	***83***	***87***	***44***	***43***	***11***	***9***	***2***	***0***	***2***
	89%	***87%***	*91%*	*92%*	*90%*	*6%*	*9%*	*2%*	*0%*	*4%*
***Post-**	***96***	***40***	***56***	***28***	***28***	***79***	***53***	***26***	***13***	***13***
	50%	*42%*	*58%*	*58%*	*58%*	*41%*	*55%*	*27%*	*27%*	*27%*

	Other target				
Prime	***All***	***L1***	***L2***	***L2A***	***L2NN***
Pre-	***12***	***4***	***8***	***5***	***3***
	6%	*4%*	*8%*	*10%*	*6%*
***Post-**	***17***	***3***	***14***	***7***	***7***
	9%	*3%*	*15%*	*15%*	*15%*

The results reveal that participants' choice of possessive description was affected by the structure of the prime sentence they had just read; participants produced 88.5% prenominal genitives after a prenominal prime compared to just 50% after a postnominal genitive prime. In addition, participants were primed into producing ungrammatical postnominal genitives: 5.7% postnominal genitive production after a prenominal genitive prime increased to 41.2% after a postnominal genitive prime. Table 12 and Figure 12 (below) show that, contrary to the predictions, it is not the Dutch L2 learners of English, but the native speakers of English who were primed into producing more ungrammatical postnominal genitives. Native speakers' postnominal genitive production increased from 9% after a prenominal genitive prime to 55% after a postnominal genitive prime (cf. 2% to 27% for Dutch L2 learners). These results are the opposite of the predictions postulated in Chapter 2. The priming effect of ungrammatical postnominal genitive primes on ungrammatical postnominal genitive prime production is greater among native speakers of English than Dutch L2 learners of English, whereas it was predicted that this would be more strongly the case for Dutch L2ers because of L1 interference.



	All	L1	L2	L2A	L2NN
Prenominal prime	5,73%	9,38%	2,08%	0,00%	4,17%
Postnominal prime	41,15%	55,21%	27,08%	27,08%	27,08%

Figure 12. Percentage postnominal genitive production according to prime for all groups (error bars: 95% CI)

In order to check whether the differences between native speakers' and L2 learners' primed postnominal genitive productions in English were significant, a Logistic Mixed Effects Regression analysis was adopted.[18] The following model accounted for a fit of dependent and independent variables and was run in R (in which Primed is the dichotomous dependent variable, Prime and Group the fixed factors, and Participant and Item random factors with participants subdivided into two language groups):

```
fit <- lmer(Primed ~ Prime * Group + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

On top of that this model investigates whether there is a Prime*Group interaction between the two fixed factors (see Table 13 below for results).

Table 13. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	2.6002	0.4659	5.580	< 0.001
Prime	-3.7546	0.5468	-6.866	< 0.001
Group	-0.4532	0.5406	-0.838	0.402
Prime*Group	1.8604	0.5873	3.168	0.002

The AIC, BIC and logLik values for this model were 385.2, 412.9 and -185.6 respectively.

The results reveal a main effect of Prime ($p<0.001$). This signifies a significant effect of prenominal and postnominal genitive primes on the primed outcome. Figure 12 illustrates

[18] Note that this experiment (unlike experiment 1) does *not* test native speakers of Dutch on their Dutch production. Only English data was elicited in this priming task (so L1 speakers refers to native speakers of English, and L2 speakers to Dutch learners of English).

that postnominal genitive primes were more likely to prime speakers into producing postnominal genitives than prenominal genitive primes. In addition, there is a significant interaction between Prime and Group (p=0.002), which suggests that different language groups were differently sensitive to postnominal genitive primes. The differences in priming effects between the different language groups are discussed in the next section.

Advanced L2ers, near-native and native participants

Making a distinction between advanced Dutch L2 learners and near-native Dutch learners of English provides more insight on how proficiency plays a role in primed non-native L2 production in this experiment. Splitting LMER analyses among these groups reveal main effects of Prime (p<0.001) in advanced L2ers, near-native L2ers and native speakers of English (see Table 14).

Table 14. Main effects of Prime according to subgroup

	Estimate	*Std. Error*	*z value*	*p value*
English L1	-1.8534	0.4686	-3.955	<0.001
Dutch L2A	-4.0651	0.8420	-4.828	<0.001
Dutch L2NN	-3.5973	0.6285	-5.723	<0.001

The negative coefficients indicate that the direction of prime differences was the same for all three subgroups; *viz.* participants were significantly more likely to be primed into producing a prenominal genitive than a postnominal genitive. As mentioned above though, Table 12 and Figure 11 show there are priming effects for postnominal genitive production too: advanced Dutch L2 learners postnominal genitive production increased from 0% to 27% after a postnominal genitive prime, for Dutch near-natives this was 4% to 27%, and for English native speakers 9% to 55%.

Traditional *t*-tests confirm a significant priming effect of postnominal genitive primes on postnominal genitive target productions in all subgroups. For advanced Dutch L2 learners of English this effect is highly significant: $t(11)=3.616$ (p=0.004). Similarly, a significant priming effect was confirmed among Dutch near-native speakers of English: $t(11)=2.366$ (p=0.037). And finally when looking at English NS data only, there was also a significant priming effect found for postnominal genitive primes on postnominal genitive production: $t(23)=6.502$ (p<0.001). However, the estimates of random slopes in Table 14 reveal that English L1ers were less sensitive to priming than the Dutch L2ers. This is confirmed in Figure 12 where postnominal genitive production among English L1ers is already elevated with prenominal primes (as opposed to the Dutch L2 data).

Aware and unaware participants

Eight out of twenty-four Dutch participants were able to guess or tell what the purpose of the experiment was *after* they did the experiment, whereas only five out of twenty-four English NS participants were able to do so too. A Boolean variable Awareness was added to the data, *i.e.* a truth value 1 was added to the participant if they were aware and 0 if they were not aware of the purpose of the experiment. Subsequently, Awareness was added as a predictor to the LMER model, resulting in a model checking for a three-way interaction between Group, Prime and Awareness:

```
fit <- lmer(Primed ~ Prime * Group * Awareness + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

This model allows for investigating to what extent awareness plays a role in syntactic priming. None of the Dutch L2ers and English NSs who were aware of the purpose of the experiment produced an ungrammatical postnominal genitive when they were primed with a grammatical prenominal genitive, though they did when primed with an ungrammatical postnominal genitive. Dutch L2ers who were aware of the purpose of the experiment were primed into producing a postnominal genitive target: 0% postnominal genitive production after a prenominal genitive prime increased to 41% after a postnominal genitive prime. For English native speakers this was 0% to 20% successively. The LMER analysis in Table 15 below reveals that the difference in postnominal genitive priming effects between aware Dutch L2ers and English NS was significant, *i.e.* there was a main effect of Prime ($p<0.001$) and a Prime*Group interaction ($p<0.001$). Though the analysis also reveals that Awareness was not a significant predictor for the overall dependent variable Primed, as there was no main effect of Awareness, nor were there any interactions with this factor.

Table 15. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	2.8082	0.5912	4.750	< 0.001
Prime	-3.9879	0.6772	-5.889	< 0.001
Group	-0.9517	0.6518	-1.460	0.144
Awareness	-0.5251	0.8325	-0.631	0.528
Prime*Group	2.8393	0.7120	3.988	< 0.001
Prime*Awareness	0.5982	0.9219	0.649	0.516
Group*Awareness	16.3603	1450.7959	0.011	0.991
Prime*Group*Awareness	-18.7210	1450.7960	-0.013	0.990

The AIC, BIC and logLik values for this model were 372.8, 416.3 and -175.4 respectively.

So Table 15 reveals there is no main effect of Group, but there is a main effect of Prime and a Prime*Group interaction. It also confirms awareness of the purpose of the

experiment is not a significant predictor for the elicited data. So, awareness did not contribute to a significant difference in participants being primed into producing ungrammatical postnominal genitives.

In general, native speakers of English were significantly more susceptible to postnominal genitive priming than the entire Dutch L2 learner group: $t(47)=-3.473$ ($p=0.001$). However, English L1ers were significantly more accurate in the Sentence-Picture Matching Task than Dutch L2ers (97.6% correct vs 91.8% correct): $t(47)=-3.786$ ($p<0.001$). Explanations for these findings are given in the discussion below.

4.3.3. Discussion

The analyses of the elicited data in this experiment reveal that all participants of the different subgroups could be primed into producing ungrammatical postnominal genitive structures. The data also reveal that English native speakers were even more susceptible to this priming effect than Dutch learners of English. One explanation for this is a difference in metalinguistic awareness of English possessive structures between the experimental groups. The Dutch learners of English were all lecturers, PhD students or language teachers of English, and therefore must have relied more on their heightened sense of metalinguistic knowledge of the L2 they are teaching/studying than the native speakers of English. The Dutch learners of English were also older than the native speakers of English, and so their increased L2 experience could have led to grammatically correct automatised routines in their L2 production. The native speakers of English, all students (mostly undergraduates) at Edinburgh University, must have relied more on implicit linguistic knowledge of English possessive structures. In addition, the scores on the Sentence-Picture Matching Task between the two groups, indicates that English native speakers focused more on answering these questions accurately than on producing grammatical structures (*i.e.* their focus was on meaning rather than form).

However, when awareness of the purpose of the experiment was taken into account, this study shows that those Dutch learners of English who were aware of the purpose of the experiment were more susceptible to being primed into producing an ungrammatical postnominal genitive than native speakers of English who were aware. So (meta)linguistic L2 knowledge did not prevent Dutch learners of English of producing ungrammatical postnominal genitive structures. An explanation for this could be that the Dutch L2ers, though aware of the differences between their L1 and L2 and the purpose of the experiment, were still eager to conform to L1 postnominal genitive preferences. So their L1 syntax was pervading through their L2 syntax; perhaps even compromising the outcome of the

experiment as a result of their awareness. On the other hand, native speakers of English who were aware of the purpose of the experiment produced less ungrammatical postnominal genitives than their unaware peers. This can be interpreted as a counterargument that awareness did not guide participants into compromising toward the experimenter and the aim of the experiment. A Logistic Mixed Effects Regression analysis confirms that awareness of the participants in this experiment did not significantly contribute to predicting priming effects. The effect of (meta)linguistic knowledge and the lack of resources to access this knowledge in real-time/online performance is addressed in Chapters 5 and 6.

4.3.4. Conclusion

The results of this study have shown that advanced Dutch L2 learners of English, even near-native speakers, can be primed into producing ungrammatical postnominal genitive constructions with animate possessors and possessums. However, this priming effect is not qualitatively different from English native speaker L1 production, as they could also be primed into producing these ungrammatical constructions. In fact, English native speakers were even more susceptible to priming of this particular construction (except for a small minority who were aware of the purpose of the experiment). So the prediction made at the start of the experiment regarding susceptibility of priming among L1ers was not borne out.

As the results show, it is very difficult to draw any conclusions on whether the Dutch L2 learners produced ungrammatical postnominal genitives because of L1 transfer or simply because of a priming effect. The higher incidence of primed postnominal genitive production in native English speakers than Dutch L2ers would indicate that the latter is true. A replication of this experiment on a grander scale could shed more light on the underlying causes of ungrammatical postnominal genitive priming.

4.4. Comparisons between experiments 1 and 2

In both the offline Magnitude Estimation Task and the online Syntactic Priming Task, it was evident that possessor animacy is a strong predictor for genitive structure preference (prenominal vs postnominal genitive). In the offline task, all three groups (near-native Dutch L2 learner experimental group, English L1 control group, Dutch L1 control group) showed the same preferences for possessive structures, *viz.*

1) *Prenominal* genitives containing an animate possessor were preferred over *postnominal* genitives containing an animate possessor;

2) In prenominal genitives: *proper nouns* as an animate possessor were preferred over *common nouns* as an animate possessor;
3) In postnominal genitives: *common nouns* as an animate possessor were preferred over *proper nouns* as an animate possessor;
4) Possessive structures with an animate possessor and possessum were rated more acceptable than possessive structures with an animate possessor and an *inanimate* possessum.

Overall when presented with a minimal pair of prenominal vs postnominal genitive structures in the offline task, Dutch L2 learners as well as English L1 speakers preferred the former over the latter in English, though Dutch L2ers rated postnominal genitives in English with higher acceptability ratings than English L1 speakers did.

In the online Syntactic Priming Task Dutch L2 learners of English and English native speakers could be primed into producing ungrammatical postnominal genitives containing an animate possessor. However, unlike the results in the offline task, in the online task it was the control group of English native speakers that showed a higher tolerance of this particular ungrammatical possessive structure, as the participants in this group were primed into producing more of these structures than the Dutch L2 learners. There are three explanations for the difference between the offline and online results:

1) Both offline and online tasks targeted similar control groups of native speakers of English (all undergraduate students at Edinburgh University of relatively similar backgrounds), though the Dutch L2 experimental groups in both tasks were of a different composition. In the offline task very advanced Dutch L2 learners of English (BA and MA students of English Language and Culture) were tested on L2 comprehension, whereas near-native Dutch L2 learners of English (PhD candidates, post-docs, language teachers and lecturers of English) were tested on L2 production in the online task. The qualitatively higher L2 proficiency and more L2 experience of the participants in the Syntactic Priming Task in experiment 2 could be the reason why the participants in this group showed less tolerance for ungrammatical postnominal genitive structures than the L2 learners in the Magnitude Estimation Task in experiment 1. That is, an increased metalinguistic awareness of L2 structures among the near-natives could be the reason why the participants in this group were ruling out the ungrammatical possessive structures more than the very advanced Dutch L2 learners in the offline task.

2) The difference in methodology is another reason for an increased tolerance of ungrammatical structures. In the offline task participants had more time to monitor the critical items presented to them, but in the online task the added time constraint of producing a sentence after the prime could be the reason why more ungrammatical possessive structures were uttered (six seconds in the Magnitude Estimation Task vs four seconds in the Syntactic Priming Task). This explanation is supported by the fact that not only the Dutch L2 learners, but also the English native speakers were more tolerant of ungrammatical possessive structures.
3) The number of experimental conditions in the online task was less than in the offline task. In the offline task, animate *proper* noun possessors (e.g. John, Henry) were presented to the participants in different genitive constructions as well as animate common noun possessors (e.g. doctor, chef), whereas in the online task only animate *common* noun possessors were presented. In addition, in the offline task inanimate possessums (e.g. pizza, watch) were incorporated in the genitive constructions, whereas in the online task only animate possessums were (e.g. monkey, mouse). These between-experiments differences in possessor noun types and possessum noun animacy make it difficult to draw direct comparisons between language comprehension and production of possessive structures. For example, postnominal genitive comprehension of 'the pizza of John' in the offline task cannot be compared to postnominal genitive production of 'the mouse of the chef' in the online task as there are two variables manipulated at once (i.e. possessor noun type and possessum animacy). The ratings for the postnominal genitives with animate proper noun possessors and inanimate possessums ('the pizza of John') were lower for the native speakers of English than the Dutch L2 learners of English in the offline task. However, in the online task the postnominal genitives with animate common noun possessors and animate possessums ('the mouse of the chef') were primed more often among the native speakers of English than the Dutch L2 learners of English. This is the opposite of what one would expect based on the offline ratings in the magnitude estimation task.

So the question is why native speakers of English were more susceptible to priming of ungrammatical structures than the Dutch L2 learners. One explanation for this is that for the near-native L2ers the sense of being tested on their L2 knowledge could have made them more vigilant on L2 grammar and spelling in their L2 production, whereas the L1ers were more focused on executing the tasks correctly and as a result paid less attention to grammaticality in their online production.

4.5. Chapter summary

This chapter presented the results of an offline task (magnitude estimation) and an online task (syntactic priming) that were designed in mind to answer the research questions with respect to near-nativeness presented in Chapter 2. Both experiments targeted English possessive structures, where the critical items were genitive constructions consisting of animate possessors and inanimate possessums, and how these were rated and to what extent primed among near-native Dutch learners of English and native speakers of English.

The data revealed that though in the offline task near-native Dutch learners of English rated these ungrammatical possessive structures higher than native speakers of English, it was the native speakers of English who were more primed into producing this structure than the near-native Dutch learners of English.

It was predicted that the ungrammatical possessive structures would be primed more often among the L2 learners than the L1 speakers as these possessive structures are grammatical in the L2 learner's L1. In other words, we predicted L1 interference seeping through in the L2 syntax at the syntax-lexicon interface, which would then correspond to the higher ratings given in the Magnitude Estimation Task by Dutch L2 learners in experiment 1. As the results of these experiments contradict one another, the conclusions drawn from these experiments are not conclusive.

Subsequently this study moves away from the subject of optionality in L1 and L2 genitive comprehension and production, and investigates another word order phenomenon at the syntax-lexicon interface of advanced Dutch learners of English in the next chapter, *viz.* residual V2 word order. However, we would like to stress that subsequent studies can still investigate whether Dutch learners of English may or may not have automatised the lexical-semantic dependency of animacy on genitive type in online production. The outcome of these studies is informative with respect to near-nativeness at the syntax-lexicon interface, and to the interface hypothesis in general.

Chapter 5 V2 structures

5.1. Chapter overview

In the previous chapter we looked for differences in (access to) knowledge (representations) on lexico-syntactic constraints in English possessive structures between highly advanced to near-native Dutch learners of English and native speakers of English and concluded that this linguistic structure did not produce unambiguous answers to the research questions posed on near-nativeness in Chapter 2. So in order to be able to answer the research questions pertaining to near-nativeness, we tested different linguistic structures (*viz.* English V2 structures) by means of an offline Magnitude Estimation Task and an online Syntactic Priming Task. The descriptions, results and analyses of these experiments are reported in this chapter. The chapter finishes with a cross-experimental comparison between the results of the offline and online tasks on the separate V2 structures tested: locative inversions and preposed adverbials of manner.

5.2. Experiment 3: Magnitude Estimation Task

This experiment tests English L1 and L2 learners' knowledge of lexico-syntactic constraints of V2 word order in English and Dutch sentences with preposed adverbials of location and manner. The prediction is that because of L1 influences Dutch L2ers give higher ratings to sentences with (un)grammatical V2 word order than the English L1ers.

5.2.1. Method

Participants

Three groups were tested:

i. An experimental group of 36 highly advanced adult Dutch learners of English (CEFR level C1 and above). These participants were largely recruited among BA, MA and PhD students of English or Linguistics at Utrecht University and Leiden University in the Netherlands (age range: 20-45, mean age: 25.0, L2 onset age range: 4-12 , mean L2 onset: 8.6; see Appendix J for individual data).[19]

[19] Even though some L2 participants reported L2 onset age under the age of 8, they were still included in the experimental group as their *formal L2 instruction* started after the age of 8 (i.e. they mistook L2 exposure for L2 formal instruction). Early L2 onset age did not have a main effect on L2 proficiency (p=0.355). In addition, the two L2 participants whose parent(s) are native speakers of English confirmed they were not raised bilingually and only spoke Dutch to their parent(s). There was no main effect here (p=0.113). Length of residence in an English speaking community did not have an effect on L2 proficiency among the L2 participants in this study (p=0.05 for more than 6 months, p=0.835 for more than 3 years).

ii. A control group of 20 native speakers of English were recruited among the students of the school of Philosophy, Psychology and Language Sciences at Edinburgh University (age range: 20-31, mean age: 24.7; see Appendix J for individual data).

iii. A control group of 21 native speakers of *ABN* Dutch of whom the majority was recruited from the final year classes of *VWO/Gymnasium* (= pre-academic) grammar school *Zandvliet College* in The Hague, the Netherlands (age range: 13-55, mean age: 19.3; see Appendix J for individual data).

Materials

The experimental materials testing for acceptability of (residual) V2 word order in language comprehension were presented both in English and Dutch. The Dutch materials were only presented to native speakers of Dutch (group iii), the English materials were presented to the other two groups. The specific V2 structures tested in this experiment were preposed adverbials of location (locative inversions) and preposed adverbials of manner. As discussed in Chapter 2, locative inversions in English can only occur with most unaccusative verbs that denote an external change of state and only with certain unergative verbs that are presented in an informationally light context (see section 2.7.1. for a detailed discussion and overview). In addition, inverted (V2) word order after preposed adverbials of manner can only occur when there is a negative polarity item present in the preposed adverbial of manner.

Preposed adverbials of location (a.k.a. locative inversion)

The experimental locative inversions under investigation contained:

a) unergative verbs,
- which are acceptable in English when the verb is informationally 'light' (*i.e.* habitual, non-eventive, atelic);
- which are always acceptable in Dutch (by default V2).

b) unaccusative verbs,
- which are acceptable in English when these are externally caused change of state verbs or non-internally caused change of state verbs denoting 'being in a certain state';
- which are always acceptable in Dutch (by default V2).

The experimental design for this part of the experiment consisted of a mixed 2x2x3 design, in which there were two within-subjects factors Information Structure and Verb Type with

two levels each and one between-subjects factor Group with three levels; thus totalling four conditions *per language* in total (see Table 16 below):

i) Information Structure
    a) 'light' or 'non-specific' context
    b) 'heavy' or 'specific' context
ii) Verb Type
    a) unergative (*e.g.* 'sing', 'work', 'sleep', 'chatter', 'live')
    b) unaccusative (*e.g.* 'appear', 'arrive', 'emerge', 'die', 'go')

Table 16. Conditions and examples of locative inversions in experiment 3

Condition	*English example*	*Dutch example*
A. light unergative	*?On the stage sang some performers.*	*Op het podium zong een paar artiesten.*
B. light unaccusative	*On the stage appeared some performers.*	*Op het podium verscheen een paar artiesten.*
C. heavy unergative	**On the stage sang The Beatles.*	*Op het podium zongen The Beatles.*
D. heavy unaccusative	*?On the stage appeared The Beatles.*	*Op het podium verschenen The Beatles.*

Preposed adverbials of manner

The experimental preposed adverbials of manner investigated contained:

a) negatives AND inverted subject-verb word order (ADV[+neg] V S ..)
    – which is acceptable in English
    – which is acceptable in Dutch (V2 by default)
b) negative AND non-inverted subject-verb word order (ADV[+neg] S V ..)
    – which is ungrammatical in English
    – which is ungrammatical in Dutch
c) positives AND inverted subject-verb word order (ADV[-neg] V S ..)
    – which is ungrammatical in English
    – which is acceptable in Dutch (V2 by default)
d) positives AND non-inverted subject-verb word order (ADV[-neg] S V ..)
    – which is acceptable in English
    – which is ungrammatical in Dutch (V2 by default)

So the experimental design for this part of the experiment consists of two within-subjects factors Polarity and Verb Order with two levels each, and a between-subjects factor Group with three levels; totalling four conditions *per language* (see Table 17 below).

i) Polarity
   a) negative (*e.g.* not, never, only)
   b) positive (*e.g.* some, certain)

ii) Verb Order
   a) Verb-Subject (V2)
   b) Subject-Verb (V3)

Table 17. Conditions and examples of preposed adverbials of manner in experiment 3

Condition	*English example*	*Dutch example*
E. negative V S (NegXVS)	*In no circumstances may the prisoners be released early.*	*In geen geval mogen de gevangenen eerder vrijgelaten worden.*
F. negative S V (*NegXSV)	**In no circumstances the prisoners may be released early.*	**In geen geval de gevangenen mogen eerder vrijgelaten worden.*
G. positive V S (*PosXVS)	**In certain circumstances may the prisoners be released early.*	*In bepaalde gevallen mogen de gevangenen eerder vrijgelaten worden.*
H. positive S V (PosXSV)	*In certain circumstances the prisoners may be released early.*	**In bepaalde gevallen de gevangenen mogen eerder vrijgelaten worden.*

For each V2 structure, there are five lexicalizations per condition, thus twenty experimental items per V2 structure. In total there are forty experimental items and an additional twenty filler items varying in grammaticality. The critical verbs that appeared in the locative inversions (unergatives vs unaccusatives) were controlled for word length and lexical frequency in both English and Dutch materials (frequency was determined using WebCelex that incorporates the COBUILD corpus for English and INL corpus for Dutch). Statistical analyses confirm there were no significant differences in word lengths ($p=0.87$ for English; $p=0.45$ for Dutch) and frequencies ($p=0.15$ for English; $p=0.37$ for Dutch) between the different conditions. There were also no significant differences in the number of words (all p values > 0.30 for English; all p values > 0.50 for Dutch) and sentence lengths (all p values > 0.70 for English; all p values > 0.50 for Dutch) between the different conditions for the locative inversions. The same is true for word count (all p values > 0.60 for English; all p values > 0.40 for Dutch) and sentence length (all p values > 0.40 for English; all p values > 0.70 for Dutch) of the preposed adverbials of manner. Appendix C lists the full details of all statistics on these experimental items.

Procedure

The adopted procedure for the Magnitude Estimation Task in this experiment is similar to the one described in section 4.2.1. In total sixty sentences (40 experimental items, 20 filler items) were judged in relation to one reference sentence a.k.a. modulus. This sentence was the same as the one used in experiment 1, *viz.* "In our scouting club he is the youngest, brave, and new member." The sentences were presented in a pseudo-randomised list in which it was made sure no items of the same experimental condition followed one another. The sixty items were randomly distributed onto four lists.

Analysis

As the main interest of this study is the difference in acceptance of residual V2 word order *in English* between highly advanced to near-native Dutch L2 learners of English and native speakers of English, the analysis will focus on these two groups specifically after the initial analysis of all three groups. The data are normalised by log-transforming the magnitude estimations into *z*-scores. Linear Mixed Effects Regression (LMER) models were adopted to investigate to what degree the factors mentioned in the experimental design can account for residual variance in the fitted models proposed, and more importantly whether they are strong or weak predictors for the magnitude estimation values.

5.2.2. Results

Locative inversion

The descriptive statistics of the mean z-scores per condition and per language group are reported in Table 18 –and graphically illustrated in Figure 13– below. The data suggests that mean *z*-scores on Dutch L1 data are considerably higher than on English L1 data *for all conditions*. However, the LMER model below, fitted to the data of all language groups (including Dutch native speakers on Dutch), in which Verb Type, Information Structure and Group where fixed effects, and participants (split by groups) and items the random effects, and its analysis (Table 19) reveals there were no main effects nor any interactions.

```
fit <- lmer(Mean_z ~ Verb Type * Information Structure * Group + (1|Group/Participant) + (1|Item), data = d)
```

So despite the differences across conditions at first glance, no differences between data sets are significant.

Table 18. Mean *z*-scores of items with locative inversions divided by group

Group	*Verb Type*	*Information Structure*	*Mean z-score*	*Std. Deviation*
Dutch L1ers on Dutch	Unergative	Light context	0.8105	0.68250
		Heavy context	0.6640	0.62038
	Unaccusative	Light context	0.8308	0.63504
		Heavy context	0.6285	0.64637
Dutch L2ers on English	Unergative	Light context	0.5185	0.83473
		Heavy context	0.5094	0.88668
	Unaccusative	Light context	0.6305	0.84905
		Heavy context	0.4376	0.98121
English L1ers on English	Unergative	Light context	0.4699	0.49719
		Heavy context	0.4491	0.45909
	Unaccusative	Light context	0.4498	0.65613
		Heavy context	0.3408	0.77250
All	Unergative	Light context	0.5855	0.72450
		Heavy context	0.5359	0.72311
	Unaccusative	Light context	0.6382	0.75191
		Heavy context	0.4645	0.84517

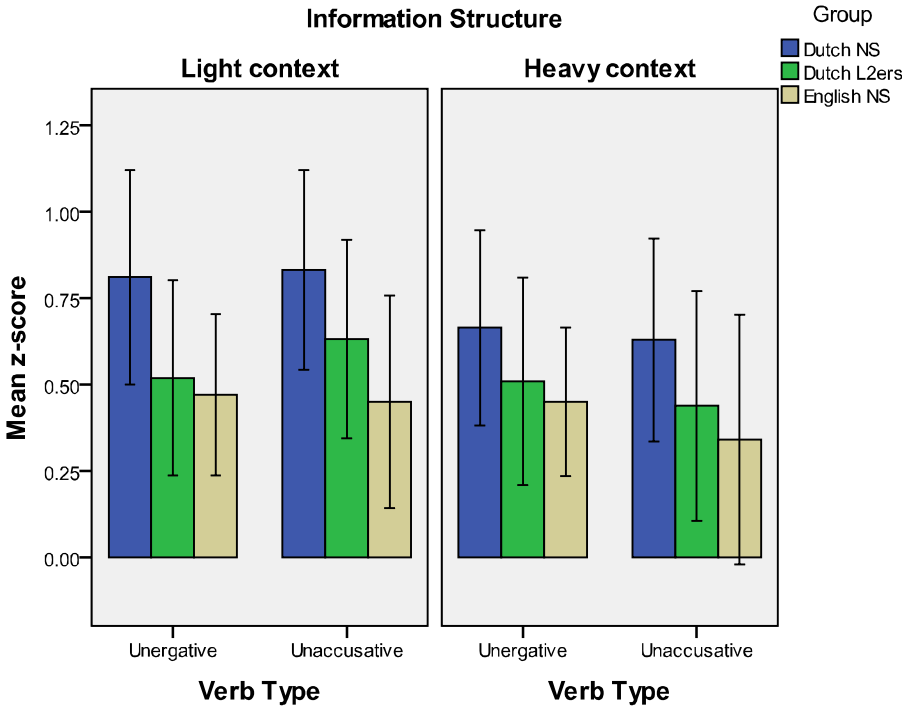


Figure 13. Mean *z*-scores of locative inversions per condition (error bars: 95% CI)

Table 19. LMER analysis of the fitted model

	Estimate	Std. Error	t value	p value
(Intercept)	0.81052	0.17852	4.540	0.0000
Verb Type	0.02027	0.10588	0.191	0.8483
Information Structure	-0.14656	0.10588	-1.384	0.1673
Group	-0.34060	0.24578	-1.386	0.1669
Verb Type * Information Structure	-0.05572	0.14973	-0.372	0.7101
Verb Type * Group	-0.04043	0.11535	-0.351	0.7262
Information Structure * Group	0.12574	0.11535	1.090	0.2765
Verb Type * Information Structure * Group	-0.03245	0.16313	-0.199	0.8424

The AIC, BIC and logLik values for this model were 370, 429.7 and -169 respectively.

Locative inversion - Dutch NSs on Dutch excluded

The next LMER analysis discarded the Dutch L1 data and only focused on L1 and L2 English comprehension of locative inversions. The same model as above was adopted, where all of the fixed factors contained two levels: Verb Type (unergative vs unaccusative), Information Structure (light context vs heavy context) and Group (Dutch L2ers vs English L1ers), and where the dependent variable was the standardised mean *z*-score of the participants.

```
fit <- lmer(Mean_z ~ Verb Type * Information Structure * Group + (1|Group/Participant) + (1|Item), data = d)
```

Table 20. LMER analysis of the fitted model

	Estimate	Std. Error	t value	p value
(Intercept)	0.518541	0.153075	3.387	0.0008
Verb Type	0.111928	0.108323	1.033	0.3026
Information Structure	-0.009131	0.108323	-0.084	0.9329
Group	-0.048614	0.231860	-0.210	0.8341
Verb Type * Information Structure	-0.183726	0.153191	-1.199	0.2317
Verb Type * Group	-0.132091	0.110023	-1.201	0.2312
Information Structure * Group	-0.011690	0.110023	-0.106	0.9155
Verb Type * Information Structure * Group	0.095551	0.155596	0.614	0.5398

The AIC, BIC and logLik values for this model were 295.6, 336.5 and -135.8 respectively.

This analysis revealed no significant main effects, nor any significant interactions. Though the descriptive statistics showed consistent higher acceptability judgement ratings for Dutch L2ers over English L1ers in all conditions, the large variation in standard deviations yields these differences non-significant (see Table 18).

There is a trend that Dutch L2ers accepted both unergatives and unaccusatives in locative inversions more than English native speakers (with bigger differences in the latter condition). In addition, both Dutch L2ers and English L1ers seemed to be more affected by

context in locative inversions with unaccusatives than unergatives. Follow-up *t*-tests did not reveal significant differences, though a clear trend can be seen in Figure 13 (where Dutch native speakers on Dutch are included as a baseline).

In sum, the fixed effects (cf. factors) did not play a significant role in determining magnitude estimations by the Dutch L2 learners of English and native speakers of English when they had to judge locative inversions.

Preposed adverbials of manner

The mean *z*-scores per condition of the participants in all language groups is reported in Table 21 and illustrated in Figure 14 below.

Table 21. Mean *z*-scores of items with preposed adverbials of manner divided by group

Group	*Polarity*	*Verb Order*	*Mean z-score*	*SD*
Dutch L1ers on Dutch	Negative	Postverbal subject (VS)	0.8489	0.48316
		Preverbal subject (SV)	0.7299	0.82112
	Positive	Postverbal subject (VS)	0.8356	0.45707
		Preverbal subject (SV)	1.0035	0.79812
Dutch L2ers on English	Negative	Postverbal subject (VS)	0.8856	0.65910
		Preverbal subject (SV)	0.6454	0.71796
	Positive	Postverbal subject (VS)	0.5913	0.86438
		Preverbal subject (SV)	0.7991	0.73441
English L1ers on English	Negative	Postverbal subject (VS)	0.6905	0.46522
		Preverbal subject (SV)	0.2346	0.91216
	Positive	Postverbal subject (VS)	0.2299	0.72485
		Preverbal subject (SV)	0.7825	0.34908

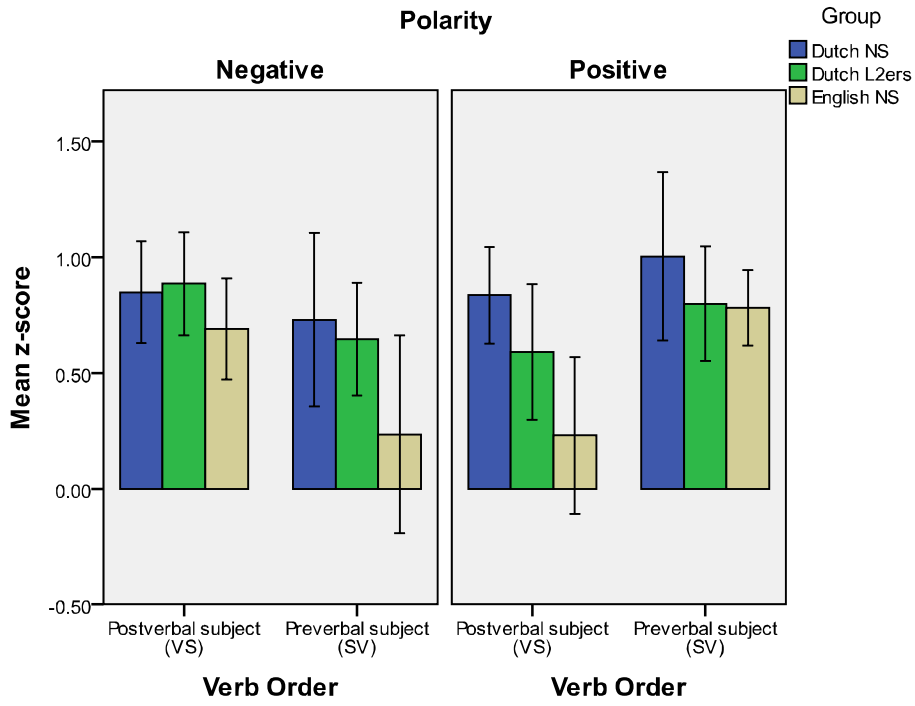


Figure 14. Mean z-scores of preposed adverbials per condition (error bars: 95% CI)

An LMER analysis with Polarity, Verb Order and Group as fixed factors, participants and items as random factors and the standardised mean *z*-scores as the independent variable was run on the data of all three language groups (Dutch L1, English L2, English L1):

```
fit <- lmer(Mean_z ~ Polarity * Verb Order * Group + (1|Group/Participant) + (1|Item), data = d)
```

Table 22. LMER analysis of the fitted model

	Estimate	*Std. Error*	*t value*	*p value*
(Intercept)	0.84886	0.17570	4.831	0.0000
Polarity	-0.01326	0.14222	-0.093	0.9258
Verb Order	-0.11891	0.14222	-0.836	0.4038
Group	-0.15832	0.23322	-0.679	0.4978
Polarity * Verb Order	0.28685	0.20114	1.426	0.1549
Polarity * Group	-0.44741	0.15494	-2.888	0.0042
Verb Order * Group	-0.33707	0.15494	-2.176	0.0304
Polarity * Verb Order * Group	0.72173	0.21912	3.294	0.0011

The AIC, BIC and logLik values for this model were 479.9, 539.6 and -224 respectively.

The analysis reveals a significant Polarity*Group interaction (p=0.004), a Verb Order*Group interaction (p=0.030) and a Polarity*Verb Order*Group interaction (p=0.001).

When comparing Dutch native speaker ratings on Dutch preposed adverbial constructions (Dutch L1 data) with English native speaker ratings on English preposed adverbial constructions (English L1 data), sentences with preposed positive adverbials and postverbal subjects (posXVS) were rated to be significantly more acceptable by native speakers of Dutch in Dutch (consistent with Dutch prescriptive grammar; V2) than those translation equivalent constructions in English by native speakers of English (where posXVS is not consistent with English prescriptive grammar as English is non-V2): t(40)=3.183 (p=0.003). In addition, comparing acceptability ratings of sentences with preposed *negative* adverbials and postverbal subjects (a structure grammatically licensed in both Dutch and English, though it is an exceptional case in the latter) shows that there were no significant differences in the acceptability ratings between native speakers of Dutch in Dutch and native speakers of English in English: t(40)=1.0689 (p=0.2917). Nevertheless, grammatically licensed residual V2 after negative preposed adverbials in English was rated significantly higher than ungrammatical V2 after positive preposed adverbials among the native speakers of English: t(19)=4.1072 (p<0.001).

A paired-sample t-test yielded a significant difference in acceptance between sentences with preposed negative adverbials and a postverbal subject (negXVS) and those with preposed negative adverbials and a preverbal subject (*negXSV), where the former is preferred over the latter (consistent with prescriptive grammar on V2 word order in English and Dutch): *t*(76)=4.402 (p<0.001).

There was also a significant difference in acceptance judgements between sentences with a preposed positive adverbial and a postverbal subject (*posXVS) and sentences with a preposed positive adverbial and a preverbal subject (posXSV), where the latter was preferred over the former (consistent with prescriptive grammar on canonical SVO word order in English, but not in Dutch): *t*(76)=-4.697 (p<0.001).

Preposed adverbials of manner - Dutch NSs on Dutch excluded

The exact same LMER model as in the previous section was fitted to the English L2 and English L1 data to explain the variance in the magnitude estimations by Dutch L2ers and English L1ers on sentences starting with preposed adverbials of manner:

```
fit <- lmer(Mean_z ~ Polarity * Verb Order * Group + (1|Group/Participant) + (1|Item), data = d)
```

Table 23. LMER analysis of the fitted model

	Estimate	*Std. Error*	*t value*	*p value*
(Intercept)	0.8856	0.1547	5.723	0.0000
Polarity	-0.2944	0.1435	-2.052	0.0414
Verb Order	-0.2402	0.1435	-1.674	0.0955
Group	-0.1951	0.2151	-0.907	0.3653
Polarity * Verb Order	0.4480	0.2029	2.208	0.0283
Polarity * Group	-0.1663	0.1457	-1.141	0.2551
Verb Order * Group	-0.2158	0.1457	-1.481	0.1401
Polarity * Verb Order * Group	0.5605	0.2061	2.720	0.0071

The AIC, BIC and logLik values for this model were 367.3, 408.2 and -171.6 respectively.

The LMER analysis reveals a significant main effect of Polarity (p=0.041), and significant Polarity*Verb Order (p=0.028) and Polarity*Verb Order*Group (p=0.007) interactions. Paired-sample *t*-tests revealed that the following conditions showed significant differences (where the critical p value was Bonferroni corrected to 0.0125; see also Figure 14):

- sentences with postverbal subjects after preposed negative adverbials (negXVS) were rated significantly *higher* than those following preposed positive adverbials (*posXVS) by the participants in both groups: $t(55)=4.495$ ($p<0.001$);
- sentences with preverbal subjects after preposed negative adverbials (*negXSV) were rated significantly *lower* than those following preposed positive adverbials (posXSV) by the participants in both groups: $t(55)=-3.967$ ($p<0.001$);
- sentences with negative adverbials followed by postverbal subjects (negXVS) were rated significantly *higher* than those with preverbal subjects (*negXSV) by the participants in both groups: $t(55)=4.457$ ($p<0.001$);
- sentences with positive adverbials followed by postverbal subjects (*posXVS) were rated significantly *lower* than those with preverbal subjects (posXSV) by the participants in both groups: $t(55)=-4.522$ ($p<0.001$).

Focusing on the specific critical condition that was predicted to induce L1 V2 transfer among the Dutch L2 learners of English, *i.e.* sentences starting with a positive adverbial of manner followed by verb-subject word order (*posXVS), did not reveal a significant difference between highly advanced Dutch L2 learners of English (English L2) and native speakers of English (English L1). Though the mean ratings for this particular structure seem considerably different (0.59 for Dutch L2ers vs 0.23 for English L1ers), the

large standard deviations between *z*-scores of the magnitude estimation values (see Table 21) make this difference non-significant: $t(55)=1.667$ ($p=0.103$).

5.2.3. Discussion

Figure 13 showed that native speakers of English and advanced Dutch learners of English pattern similarly with respect to accepting certain locative inversions with particular verb types in particular contexts. Not only did advanced Dutch L2ers behave similarly in English, but the native speakers of Dutch also behaved similarly *in Dutch*. That is, all groups preferred locative inversions embedded in light contexts rather than in heavy contexts, and in the latter context all groups preferred unergative verbs rather than unaccusative verbs. The statistical analyses showed there were no significant differences in behaviour between the the participants of different language groups.

An explanation for this uniform phenomenon can be found in the 'stand-alone' presentation of test items. For example, a sentence like "In the cave lived Batman" where there is no discourse-referent/preceding context sounds laborious. The more canonical discourse structure of conveying the same information would be "Batman lived in the cave". However, if the sentence was to be preceded with another sentence that has end-focus on the location, the use of locative inversion would make much more sense, *e.g.* "Under the house there was a cave. In the cave lived Batman." In this experiment, sentences were only presented one at a time in the offline experiment and subsequently acceptance ratings may have been skewed. So the unjustified use of the non-canonical locative inversion could be the reason why Dutch NSs, Dutch L2ers, and English NSs rated the different conditions of the test items similarly across languages.

Nonetheless, the Dutch L2ers rated unaccusatives more acceptable ($\mu=0.53$ for light and heavy contexts conflated) in locative inversions than English NSs did ($\mu=0.40$ for light and heavy contexts conflated), though the descriptives also show that this comes mainly from accepting unaccusatives in light contexts. A closer look at the acceptance ratings of the Dutch L1 group on unaccusatives in *Dutch* locative inversions reveals that the Dutch accept this structure much more ($\mu=0.73$ for all contexts) than the English NSs did in English. An explanation for this is that in Dutch any verb, be it unaccusative or unergative, is allowed in a locative inversion because in these constructions the verb is in the second position, exactly what a V2 language like Dutch prescribes.

Consequently, one could wonder whether the Dutch are less able to distinguish unaccusatives from unergatives inside locative inversions than the English NSs. This is unlikely however given the prominence of the 'split intransitivity hierarchy' cross-

linguistically, in which speakers of different languages can distinguish unaccusatives from unergatives relatively easy (see Sorace 1993 for Italian, Keller and Sorace 2000 for German; Sorace and Shomura 2001 for Japanese; Montrul 2004 for Spanish a.o.). So the alternative explanation is that the Dutch L2 learners of English have problems integrating the information cues with respect to the split intransitivity hierarchy in their second language. The difference in acceptability ratings between unaccusatives and unergatives embedded in L2 English locative inversions, see Table 18, confirms this (light context: 0.63 for unaccusatives and 0.52 for unergatives; heavy context: 0.44 for unaccusatives and 0.51 for unergatives).

Both in the L1 Dutch control group as well as in the L2 English experimental group did the Dutch show smaller differences in acceptability ratings between unaccusatives and unergatives than the English NSs did in English, especially in the heavy context condition (0.34 for unaccusatives, 0.45 for unergatives). The reason for this is that in English only *certain* verbs are allowed in locative inversions (see literature review in Chapter 2). So one would expect English NSs to have developed a cue for which verbs are allowed inside English locative inversions where Dutch learners of English may have not developed such a cue, as all types of verbs are allowed in Dutch locative inversion by V2 default (consequently impeding the process of integrating transitivity cues for locative inverted structures).

Even though the differences in acceptability ratings are not significant between Dutch L2ers and English NSs in offline L2 comprehension; these could very well be different for online L2 production as Dutch L2 learners are not able to carefully monitor which verbs may and may not appear inside locative inversions under such circumstances. We will explore this avenue in experiment 4 (see section 5.3).

As for the other structure, preposed adverbials of manner, Dutch L2ers gave higher ratings to all structures in all possible conditions than the English NSs. The reason for this is that preposed adverbials in Dutch as opposed to English are always possible in V2 contexts, since in Dutch the preferred position of the verb is in 2nd position (cf. explanation locative inversion above).

Both Dutch L2ers and English NSs preferred preposed negative adverbials with postverbal subjects (negXVS; μ=0.82) more than preposed positive adverbials with postverbal subjects (*posXVS; μ=0.46) *in English*. The explanation for Dutch L2ers is quite straightforward as any preposed adverbial *in Dutch*, be it of positive or negative polarity, requires a postverbal subject as described by the V2 grammar. Though Dutch L2ers could

have been influenced by their explicit linguistic knowledge of English grammar, the statistics reveal higher acceptance ratings for these structures than English NSs'.

English NS preferences of negative preposed adverbials with postverbal subjects over positive preposed adverbials with postverbal subjects are consistent with English prescriptive grammar. From this it follows that preposed positive adverbials with preverbal subjects (posXSV) are more preferred than negative preposed adverbials with preverbal subjects (*negXSV). The results show that this is true for both Dutch L2ers and English NSs. So, again the Dutch L2ers and English L1ers adhere to prescriptive English grammar rules on word order after preposed adverbials. It is interesting to note here that the difference in acceptance between preverbal and postverbal subjects in preposed adverbial constructions is much smaller in the Dutch L2 group (0.80 vs 0.59) than in the English NS group (0.78 vs 0.23). This indicates that the English L1ers judged these structures more on the extreme ends of their gradient scale (i.e. more towards a binary system of grammatical/ungrammatical) than the Dutch L2ers who judged these structures more towards the middle of their gradient scale. In sum, the English native speakers were more certain about what was grammatical and what was not grammatical in their judgements.

5.2.4. Conclusion

In most respects, highly advanced Dutch learners of English behave similarly to native speakers of English with respect to V2 word order preference in English locative and negative inversions, though there are some significant differences in word order preferences after positive preposed adverbial structures. So the prediction made in 5.2. was only borne out for the sentences with preposed adverbials of manner containing a positive polarity item (i.e. ungrammatical V2), but not for the locative inversions and sentences with negative preposed adverbials of manner (i.e. grammatical V2).

As the offline tasks provided enough time for the advanced Dutch learners of English to make their judgements, the difference in acceptability ratings cannot be attributed to time pressure. One of the explanations we proposed earlier for the differences between the experimental group and the control group was that this is the result of underspecification of grammatical L2 knowledge of the L2 learners (see section 2.4). However, the data showed similar patterns for L1 and L2 comprehension across the different conditions (see Figures 13 and 14), thereby indicating there is no clear underspecification of the L2 grammar compared to the L1 grammar. Despite the similar patterns these figures did show different degrees of sensitivity in L1 and L2 magnitude estimations, indicating that L1ers were more confident in their judgements than L2ers. So it is not underspecification but rather a breakdown of

efficient information integration between lexical and syntactic cues at the syntax-lexicon interface that leads to less confident magnitude estimations among the near-native L2 learners (see discussion on processing below). As the results show even highly advanced Dutch learners of English may mistakenly accept positive adverbials with a postverbal subject. The reason for this being that the omission of negative polarity (and use of positive polarity instead) in the preposed adverbial may not necessarily be a cue for them to adopt preverbal subjects (as it would for the English native speakers) since this is not the case in their native language.

In addition, the results on locative inverted structures showed there were no significant differences between the different groups tested, though there was a clear trend in Dutch advanced learners of English accepting unaccusatives in locative inversions in heavy contexts more than English native speakers despite the fact of their understanding that this specific structure is not preferred in English (as the differences between this structure in Dutch and in English pointed out).

Thus, the results corroborate there was no underspecification of grammatical L2 knowledge at the syntax-lexicon interface with respect to the locative inversion structure. This was also true for the sentences starting with preposed adverbials of manner. So an explanation for the interface phenomena associated with word order after preposed positive adverbials then points towards either: a) a processing limitation account, or b) a resource allocation deficiency (see Sorace 2011 and commentaries). In the former account L2 learners cannot integrate information from the lexicon and syntax efficiently, and in the latter account L2 comprehension or production may have been hindered because of a lack of cognitive resources available (i.e. not enough time or working memory capacity to deal with the L2). As the Dutch L2 learners had ample time and no extra memory load to cope with apart from L2 processing in general (i.e. full access to cognitive resources) the former of the two accounts explains the L2 behaviour in this experiment. In order to draw any more generalisations on how highly advanced to near-native Dutch L2ers of English behave with respect to residual V2 word order at the syntax-lexicon interface, we need to test the experimental materials under different circumstances (i.e. under time/memory pressure, and test for L2 production as well). The experiments in the next sections deal with these issues.

In sum, this experiment revealed that highly advanced Dutch learners of English and native speakers of English behaved similarly with respect to locative inversions. However, an increase in processing costs could make a difference between the two groups. That is, not finding an underspecification of grammatical L2 knowledge at the syntax-lexicon interface does not automatically imply there is no difference in L2 processing of the structure

mentioned. So the next logical step is to examine online processing of advanced Dutch learners of English and to compare their online L2 comprehension and production with native speakers of English. The next experiment (experiment 4) focuses on real-time integration of lexical cues with syntactic knowledge in an online Syntactic Priming Task, thereby testing the L2 learner's processing limitations. Subsequent experiments 5-8 adopt similar paradigms but with added memory or time load tasks as to test the resource allocation deficiency account.

5.3. Experiment 4: Syntactic Priming Task

This production task tests for online access to knowledge of lexico-syntactic constraints on V2 word order in English sentences starting with adverbials of location and manner. The prediction is that Dutch L2 learners of English are primed into producing more ungrammatical V2 structures than the English L1ers.

5.3.1. Method

Participants

The participants in this experiment were the same participants as in the Syntactic Priming Task of possessive structures (experiment 2, see previous chapter). The groups are repeated below:

i. An experimental group of 24 very advanced Dutch learners of English (age range: 23-64, mean age: 37.6, L2 onset age range: 9-12, mean L2 onset age: 11.1; see Appendix J for individual data).[20] The participants were language teachers, lecturers, post-docs or PhD students from the English departments at Leiden and Utrecht University, and were all subjected to a semi-spontaneous structured interview in which their L2 production was recorded and consequently assessed on near-nativeness by native speakers of English (see criteria White & Genessee 1996 and Appendix H). From these recordings native speakers of English judged:
    a. 12 participants to be near-native (*i.e.* indistinguishable from natives);
    b. 12 participants to be advanced L2ers (*i.e.* distinguishable from natives).

ii. A control group of 24 native speakers of English (age range: 17-31, mean age: 23.5; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University.

[20] As reported in experiment 2, having non-native Dutch speaking parents did not have a significant effect on the L2 proficiency of the L2 learners of English (p=0.75) and there was also no significant main effect of having resided in an English community for more than 6 months (p=0.19) or 3 years (p=0.20) on the L2 proficiency of the L2 participants.

Materials

The same V2 structures (locative inversions, preposed adverbials of manner) as in experiment 3 were tested, though the experimental materials and designs in the syntactic priming of locative inversions were simplified (*i.e.* leaving out Information Structure as a factor).

Locative inversions

The syntactic priming of locative inversions was modelled after a mixed 2x2 experimental design, consisting of a within-participants factor Verb Type (unergative vs unaccusative) and a between-participants factor Group (Dutch L2 vs English L1). The locative inversion primes contained either:

a) unergative verbs (sing, work, sleep *etc.*), *e.g.* *In the spotlight sang a rock star.
b) unaccusative verbs (appear, arrive, go *etc.*), *e.g.* In the spotlight appeared a rock star.

The locative inverted prime sentences were controlled for word count and sentence length. Paired sample *t*-tests confirm there were no significant differences in word count ($p=1$) and sentence length ($p=0.36$) between the different conditions (see Appendix D for all statistics on the experimental items). The critical verbs in the locative inversions (unergatives & unaccusatives) were controlled for lexical frequency using WebCelex (2001) that draws from the COBUILD corpus for English and the INL corpus for Dutch. Paired sample *t*-tests confirm no significant difference in lexical frequency of these verbs between the different conditions ($p=0.60$).

However, the statistical analyses indicate there was a significant difference in word length between the unergative and unaccusative verbs ($p=0.03$). We believe that this difference did not impact the participants' responses as the sentence lengths of the prime sentences were controlled for, and so the total reading time for the sentences in different conditions would have been the same on average. See Appendix D for all the experimental items and their statistics.

Preposed adverbials of manner

As for priming residual V2 word order after preposed adverbials of manner, a 2x2x2 experimental design was adopted, in which there are two within-participant factors Word Order and Polarity and one between-participants factor Group. All of these factors consist of two levels each: verb-subject (V2) and subject-verb (V3) for Word Order, negative and

positive for Polarity, and Dutch L2 and English L1 for Group successively. This experimental design yields the following four conditions in which preposed adverbials of manner contained:

a) a negative adjunct followed by inverted verb-subject word order: (ADV[+neg] V S …), *e.g.* "In no circumstances may you smoke."
b) a negative adjunct followed by canonical subject-verb word order: (ADV[+neg] S V …), *e.g.* "*In no circumstances you may smoke."
c) a positive adjunct followed by inverted verb-subject word order: (ADV[-neg] V S …), *e.g.* "*In some circumstances may you smoke."
d) a positive adjunct followed by canonical subject-verb word order: (ADV[-neg] S V …), *e.g.* "In some circumstances you may smoke."

The prime sentences were all controlled for word count and sentence length. Post-hoc Bonferroni corrected *t*-tests revealed there are no significant differences in word count (all p values > 0.30) and sentence length (all p values > 0.20) between the different conditions. See Appendix D for all the experimental items and their statistics.

All V2 structures

For each V2 structure, there were ten lexicalizations per condition, thus twenty experimental items for locative inversions and forty experimental items for preposed adverbials. In total there were sixty experimental items. An additional eighty filler items varying in grammaticality were added to the item pool: twenty of them were sentences containing modified noun phrases (*e.g.* "This is the graceful ballerina."), twenty of them were sentences containing numerals followed by plural nouns (*e.g.* "There are five pencils."), twenty of them were sentences describing objects with respect to location (*e.g.* "Two airplanes are flying in the sky."), twenty of them were sentences that expressed recommendations which participants had to complete themselves (*e.g.* "In case of emergency …"). In total, one hundred-and-twenty items were presented only once to the participants in random order in four blocks.

Procedure: Locative inversion

Residual V2 production in the form of locative inversions was primed and tested via a similar computerised priming task as described in 4.3.1. The protocol of a Sentence-Picture Matching Task followed by a Picture Description Task was exactly the same. The prime-target pairs consisted of highly frequent lexical items and images depicting easy-to-recognise locations (*e.g.* cave, tree, tent), animals (*e.g.* bat, monkey, horse) and human beings in a stereotypical vocation (*e.g.* doctor, policeman, fire fighter), along with arrows and symbols in order to clarify the relationship between the entities.

For the locative inversion prime, three elements were shown to the participant: 1) an image of a location, 2) an unergative or unaccusative verb in print, and 3) an image of an agent or experiencer. The picture of the location was presented as many times on the left-hand side of the computer screen as it was on the right-hand side (to counterbalance for effects of left-to-right reading order) and in doing so was alternated with pictures of the agent/experiencer on the left or right. The unergative or unaccusative verb depicting the action of the agent/experiencer was presented in the middle of the screen along with an arrow (see Figure 15 below).

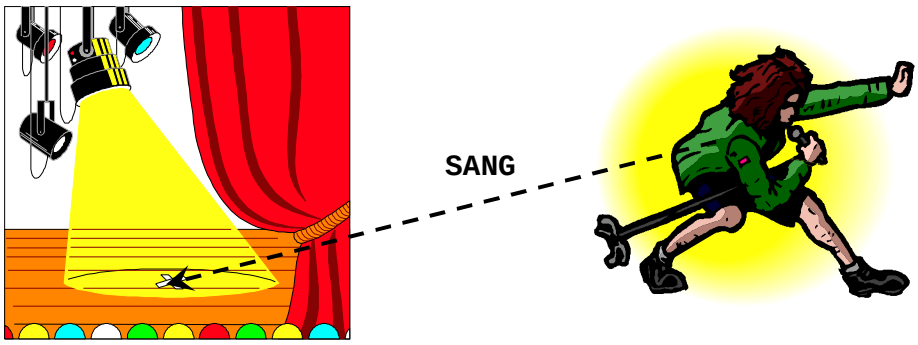


Figure 15. Example of an experimental item containing an agent, unergative verb, and location (target structures: *In the spotlight sang a rock star / A rock star sang in the spotlight)

Procedure: Preposed adverbials of manner

The method used to prime preposed adverbials of manner was largely similar to the method of locative inversion priming. The prime sentences with preposed adverbials of manner contained either positive or negative polarity items and were followed by a Picture Verification Task. In the subsequent Picture Description Task, sentences with preposed adverbials were elicited by means of traffic signs, ticks, crosses and incomplete utterances. In other words, the Picture Description Task was a Sentence Completion Task where

participants had to complete a sentence starting with a preposed adverbial of manner using the graphical information provided (see Figure 16 below).

In no circumstances ……..

Figure 16. Example of a sentence completion item for a preposed adverbial of manner (target structures: In no circumstances (may people) / (*people may) smoke)

The following procedures were adhered to in testing for word order priming in locative inversions and after preposed adverbials of manners. The experimental and filler items of both linguistic structures were combined into prime-target pairs such that neither the prime sentence with matching picture nor the target sequence with matching picture where repeated in either a target sequence or a prime sequence. All items were presented once to the participants in four blocks of four prime-target pairs, thus totalling sixteen experimental items. The items were randomised for each participant. The participants were first subjected to a practice session of six items before the experiment started. The participants were asked to sign a consent form first (see Appendix I) and were informed their language production would be recorded and transcribed anonymously for the purposes of the experiment.

Analysis

The analyses of primed word order after preposed adverbials of location and manner were conducted separately by means of Logistic Mixed Effects Regression (LMER). This type of analysis has proven to interpret mixed designs (*i.e.* data involving within-participants factors as well as between-participants factors) more accurately than separate repeated measures ANOVAs with F1 and F2 analyses for items and participants respectively. In addition, the factors/effects in a fitted LMER model act as predictors and thus can explain to what degree the factors in such a model predict the outcome: V2 word order primed or not primed.

If it turned out participants were not paying attention to the presented materials, *i.e.* answer more than 25% of the picture-phrase matching questions incorrectly, then their L2 productions after the prime were not scored and discarded from the data set. If participants

corrected their L2 productions, it was the first production (including incomplete utterances) that were analysed in the data analysis since it is the first automatic response (cf. initial parse) that underlies online L2 performance at the syntax-lexicon interface that is under investigation here.

5.3.2. Results locative inversions

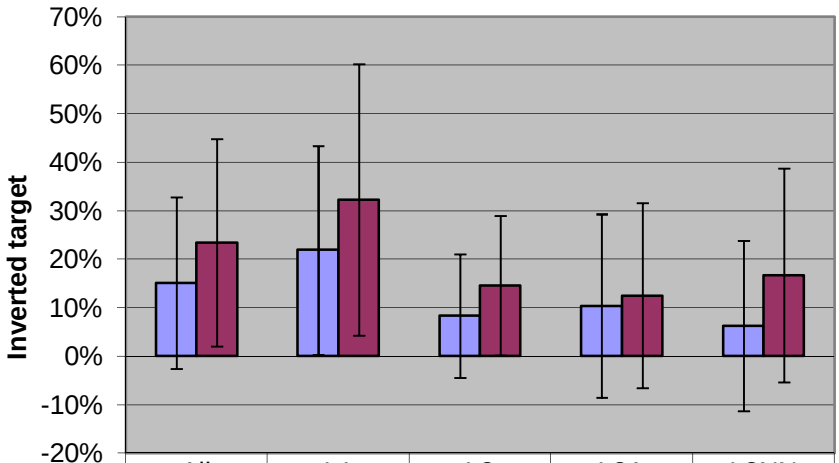
None of the data elicited from the participants from both groups (English L2, English L1) were excluded in this analysis, as the participants were successful in answering more than 75% correct of the sentence-picture matching questions. So the results reported here pertain to all 48 participants. Subsequent analyses, however, will investigate subsets of the elicited data according to participants' L2 proficiency (as the secondary aim of this study is to examine to what degree proficiency plays a role in primeability of ungrammatical structures). Table 24 below shows the frequencies and percentages of target responses according to prime for: i) all participants (N=48), ii) the native speakers of English (L1: N=24), iii) the Dutch learners of English (L2: N=24), subsequently divided into iiia) advanced Dutch learners of English (L2A: N=12) and iiib) Dutch near-native speakers of English (L2NN: N=12).

Table 24. Frequencies and percentages of target responses according to prime per group

	Locative inversion					***Uninverted (canonical)***				
Prime	***All***	***L1***	***L2***	***L2A***	***L2NN***	***All***	***L1***	***L2***	***L2A***	***L2NN***
***Unergative**	**29** 15%	**21** 22%	**8** 8%	**5** 10%	**3** 6%	**145** 76%	**66** 69%	**79** 82%	**36** 75%	**43** 90%
Unaccusative	**44** 23%	**31** 32%	**13** 15%	**5** 13%	**8** 17%	**125** 65%	**60** 63%	**65** 68%	**33** 69%	**32** 67%
	Other									
Prime	***All***	***L1***	***L2***	***L2A***	***L2NN***					
***Unergative**	**17** 9%	**8** 8%	**9** 9%	**7** 15%	**2** 4%					
Unaccusative	**23** 12%	**5** 5%	**18** 19%	**10** 21%	**8** 17%					

The difference between native speakers of English and advanced to near-native Dutch learners of English on English sentence production after a locative inversion prime becomes clear from Figure 17 below. In this figure one can see clearly that native speakers of English produced more locative inversions (either containing an unergative or an unaccusative verb) than native speakers of Dutch. This is contrary to what one would expect,

as locative inversions in Dutch are not as marked a structure as they are in English. That is, in English these stylistic inversions are most of the times context-dependent, and grammatically odd when presented in a stand-alone fashion as in this experiment (and as a result of their markedness one would not expect this structure to be very frequent in the L2 input of Dutch learners of English). However, this is not the case in Dutch, where these structures can be uttered without a preceding context licensing it (since topic focus is common in Dutch, whereas English adopts end focus).



	All	L1	L2	L2A	L2NN
Unergative prime	15,1%	21,9%	8,3%	10,4%	6,3%
Unaccusative prime	23,4%	32,3%	14,6%	12,5%	16,7%

Figure 17. Locative inversion production according to prime among all groups (error bars: 95% CI)

The elicited data on locative inversions are insufficient for drawing conclusions on priming effects as participants were only primed with locative inverted structures with either unergative or unaccusative verbs, and not with the canonical non-inverted equivalents containing these verbs. Nonetheless, one can still deduce from the data the effect of verb type on acceptance of locative inverted structures among Dutch L2ers and native speakers of English, and the subsequent differences between these groups.

Figure 17 shows that participants' production of locative inversions was affected by the verb type in the prime sentence they had just read. On average participants produced 23% locative inversions with unaccusatives after a similar prime structure compared to just 15% locative inversions with unergative verbs after a similar prime structure. When examining L1 and L2 speaker groups separately, it shows that 32% locative inversions with unaccusatives were produced versus 22% locative inversions with unergatives among L1 speakers, and 15% locative inversions with unaccusatives versus 8% locative inversions with

unergatives for L2 speakers. So, across all groups there was a tendency of accepting and producing locative inversions with unaccusative verbs over locative inversions with unergative verbs after similar primes.

In order to check whether the preference of unaccusatives over unergatives inside locative inversions was significant and whether the difference between native speakers' and L2 learners' productions regarding this preference were significant, a Logistic Mixed Effects Regression analysis was adopted. The following model was implemented to account for a fit of the dependent and independent variables in this experiment, and was subsequently run in R:

```
fit <- lmer(Primed ~ Prime * Group + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

In this LMER model Primed is the dichotomous dependent variable, Prime and Group the fixed factors, and Participant (divided in language groups) and Item the random factors. In addition, this model investigates whether there is a Prime*Group interaction between the two fixed factors (see Table 25 below for results).

Table 25. LMER analysis of the fitted model

	Estimate	***Std. Error***	***z value***	***p value***
(Intercept)	-3.75795	0.82262	-4.568	< 0.001
Prime	0.82359	0.97128	0.848	0.3965
Group	1.61295	0.76328	2.113	0.0346
Prime*Group	0.05998	0.68371	0.088	0.9301

The AIC, BIC and logLik values for this model were 313.7, 341.4 and -149.9 respectively.

Table 25 reveals a main effect of Group (p=0.035), but no effect of Prime, nor a Prime*Group interaction. This means that unergative and unaccusative primes did not have a significant effect on the direction of the primed outcome between the different experimental groups (each experimental group showed the same preference), though the experimental groups in itself were a significant predictor for the primed outcome.

Advanced L2ers, near-native and native participants

Additional LMER analyses were conducted to examine how different language groups are differently sensitive towards the primed outcome. The main findings of these analyses are summarised in Table 26 below. The statistical analyses show that there were no significant main effects of Prime among all three groups. So the main effect of Group reported in the previous analysis must come from some other variance, or residual error.

Table 26. Main effects of Prime according to subgroup

	Estimate	*Std. Error*	*z value*	*p value*
English L1	0.910	0.851	1.070	0.285
Dutch L2A	0.248	0.797	0.311	0.756
Dutch L2NN	1.377	1.555	0.886	0.376

Aware and unaware participants

From the twenty-four Dutch participants in this experiment, eight were able to guess or tell what the purpose of the experiment was *after* they did the experiment. Among the native speakers of English, this was only five out of twenty-four. In order to investigate whether the participants' awareness of the purpose of the experiment had any influence on the primed outcome of the word order, the model in the previous LMER analysis was updated with a predictor Awareness. The factor Awareness was implemented as a binary variable, in which 1 means the participant was aware of the purpose of the experiment and 0 means the participant was not. Subsequently, the model was rerun, checking for a three-way interaction between Prime, Group and Awareness:

```
fit <- lmer(Primed ~ Prime*Group*Awareness + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

The LMER analysis in Table 27 below shows that the difference in number of locative inversion productions between aware Dutch L2ers and English NSs was significant, *i.e.* there was a main effect of Group (p=0.021), thought there was no Group*Prime interaction. In addition, the LMER analysis revealed no main effect of Awareness, nor any interactions with this fixed factor. So this means that Awareness is not a significant predictor for the overall Primed dependent variable.

Table 27. LMER analysis of the fitted model

	Estimate	***Std. Error***	***z value***	***p value***
(Intercept)	-4.2484	0.9898	-4.292	< 0.001
Prime	0.7682	1.1211	0.685	0.4932
Group	2.2192	0.9644	2.301	0.0214
Awareness	1.2444	1.2037	1.034	0.3012
Prime*Group	-0.1313	0.8915	-0.147	0.8829
Prime*Awareness	0.1281	1.0898	0.118	0.9064
Group*Awareness	-1.9603	1.7570	-1.116	0.2645
Prime*Group* Awareness	1.2221	1.5748	0.776	0.4377

The AIC, BIC and logLik values for this model were 318.6, 362.1 and -148.3 respectively.

In sum, no conclusions can be drawn with respect to priming effects, but there is a significant difference in locative inversion production between the different language groups: the native speakers of English produced significantly more locative inversions than the Dutch L2 learners of English (as illustrated in Figure 17).

5.3.3. Discussion of locative inversions

Both Dutch learners of English and native speakers of English produced more locative inversions with unaccusatives than with unergatives. This result was predicted from the start as unaccusative verbs do not assign theta-roles and therefore are 'less informationally heavy' than unergative verbs. However, the English native speakers produced more locative inversions in total than the Dutch learners of English. This is quite a surprising result as locative inversions appear less in English than in Dutch.

An explanation for this outcome could be the differences in access to *explicit* metalinguistic knowledge by the participants between the experimental groups. The Dutch learners of English were all lecturers, PhD students or language teachers at the English departments of Leiden and Utrecht University. As a result of their positions as language researchers and/or language educators they possess a heightened sense of explicit metalinguistic knowledge of the English language, more so than the native speakers of English who were all students (mostly undergraduates) at Edinburgh University. So the Dutch L2 learners used their explicit metalinguistic knowledge of English to their advantage and subsequently avoided producing ungrammatical structures in more cases than English native speakers avoided producing these ungrammatical structures. The structural priming task adopted in this experiment was devised to avoid metalinguistic strategies, but automatised routines stemming from metalinguistic L2 knowledge could not prevent the near-native L2 learners from producing grammatical structures when they were primed with their ungrammatical equivalents. In order to avoid metalinguistic strategies altogether we devised a syntactic priming task with limited access to cognitive resources (experiment 6). The idea is that syntactic priming tasks under time pressure or extra memory load hinders the process of automatic retrieval of (meta)linguistic L2 knowledge and so advanced to near-native Dutch L2 learners' L2 production is genuinely unmonitored (see experiments 6 to 8).

Further evidence comes from the different registers used among the Dutch and English participants. The native speakers of English described pictures in a more narrative/informal style –indicating unconscious language monitoring, whereas the Dutch learners of English described the pictures in a more academic/formal style –indicating conscious language monitoring. The latter was confirmed by the answers given by the

participants to the questions posed after the experiment, where Dutch L2 learners acknowledged to have experienced the pressure of being tested on their L2 knowledge. In addition to this, scores on the Sentence-Picture Matching Task between the two groups indicate that English native speakers focused more on answering these questions accurately than on producing grammatical structures (*i.e.* focus on meaning rather than on form).

5.3.4. Results preposed adverbials of manner

No participants were excluded from the analyses as they all answered more than 75% correct of the sentence-picture matching questions. However, this section also analyses subsets of the overall participant group (*i.e.* Dutch L2ers according to L2 proficiency). Table 28 shows the frequencies and percentages of target responses to primed sentences with grammatical V2 (NegXVS), ungrammatical V2 (*PosXVS), grammatical V3 (PosXSV) and ungrammatical V3 (*NegXSV) structures per participant group.[21]

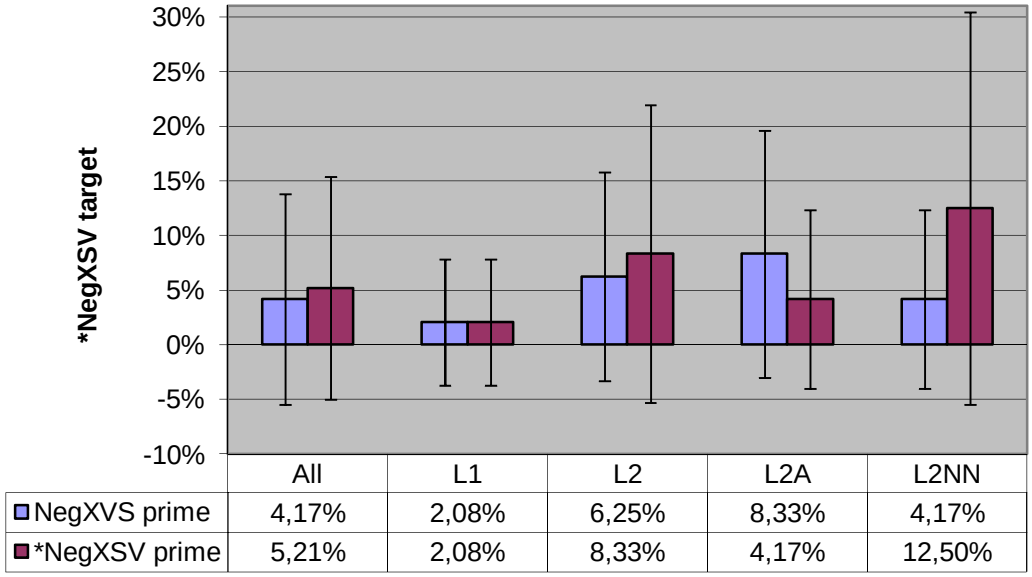
Table 28. Frequencies and percentages of target responses according to prime per group

	NegXVS target				***NegXSV target**				***PosXVS target**			
Prime	***L1***	***L2***	***L2A***	***L2N***	***L1***	***L2***	***L2A***	***L2N***	***L1***	***L2***	***L2A***	***L2N***
NegXVS	**44**	**36**	**14**	**22**	**1**	**3**	**2**	**1**	**0**	**0**	**0**	**0**
	92%	75%	58%	92%	2%	6%	8%	4%	0%	0%	0%	0%
***NegXSV**	**43**	**39**	**21**	**18**	**1**	**4**	**1**	**3**	**0**	**0**	**0**	**0**
	90%	81%	88%	75%	2%	8%	4%	13%	0%	0%	0%	0%
***PosXVS**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**13**	**6**	**7**
	0%	0%	0%	0%	0%	0%	0%	0%	17%	27%	25%	29%
PosXSV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**1**	**2**
	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	4%	8%

	PosXSV target				**Other target**			
Prime	***L1***	***L2***	***L2A***	***L2N***	***L1***	***L2***	***L2A***	***L2N***
NegXVS	**0**	**0**	**0**	**0**	**3**	**8**	**8**	**0**
	0%	0%	0%	0%	6%	17%	33%	0%
***NegXSV**	**0**	**0**	**0**	**0**	**4**	**5**	**2**	**3**
	0%	0%	0%	0%	8%	10%	8%	13%
***PosXVS**	**37**	**31**	**15**	**16**	**3**	**4**	**3**	**1**
	77%	65%	63%	67%	6%	8%	13%	4%
PosXSV	**47**	**43**	**22**	**21**	**0**	**2**	**1**	**1**
	98%	90%	92%	88%	0%	4%	4%	4%

[21] NegX stands for a preposed adverbial of manner containing a negative polarity item, where PosX is the positive equivalent. VS indicates verb second followed by a postverbal subject, and SV indicates canonical subject-verb word order.

The differences between native speaker and L2 learners' target responses to ungrammatical primes are the focus of this study, and are illustrated in Figures 18 and 19 for preposed adverbials with negative and positive polarity items respectively.



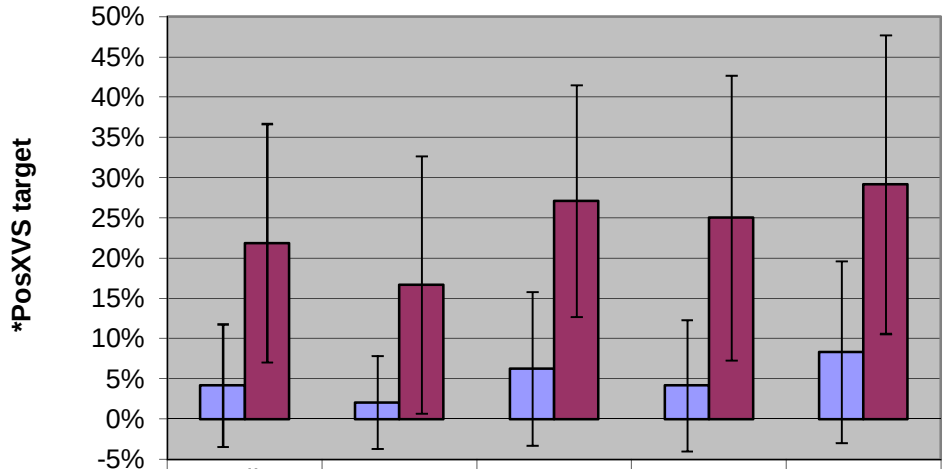
	All	L1	L2	L2A	L2NN
NegXVS prime	4,17%	2,08%	6,25%	8,33%	4,17%
*NegXSV prime	5,21%	2,08%	8,33%	4,17%	12,50%

Figure 18. Ungrammatical V3 production according to NegX primes among all groups (error bars: 95% CI)

Figure 18 shows that participants could be primed into producing ungrammatical V3 word order after a preposed adverbial of manner with a negative polarity item in it. It also shows that Dutch L2 learners of English were much more prone to be affected by priming effects than native speakers of English. A more detailed analysis reveals that advanced L2 learners of English in fact produced more NegXVS (V2) structures after a *NegXSV prime than after a NegXVS prime (88% vs 58% respectively; see Table 28). This could indicate overt correction due to (meta)linguistic knowledge being triggered by the ungrammatical V3 prime.

In contrast, native speakers of English produced the grammatical V2 structure invariably, no matter whether they were primed with NegXVS or *NegXSV word order (92% and 90% respectively; see Table 28). Only 2% of all native speakers' production consisted of the earlier mentioned ungrammatical V3 structure, whereas this was 8% for all Dutch L2 learners. Contradictory to expectations it was the near-native Dutch L2 group that produced more ungrammatical V3 (13%) than the advanced Dutch L2ers (4%), see Figure 18.

Figure 19 reveals that when Dutch L2ers were primed with a preposed adverbial containing a positive polarity item followed by a grammatical SV (V3) word order, they only produced an ungrammatical V2 structure after a positive preposed adverbial in 6% of the times. The native speakers of English produced even less ungrammatical V2 structures after SV primes, *viz.* 2%. However, when the participants were primed with a positive preposed adverbial followed by ungrammatical VS (V2) word order, both Dutch L2ers as well as native speakers of English were more likely to produce an ungrammatical V2 structure. This so-called priming effect was of a bigger magnitude for the Dutch L2ers (6% in SV prime condition increased to 27% in VS prime condition) than for the native speakers of English (2% in SV prime condition increased to 17% in VS prime condition). Both advanced Dutch L2 learners of English and near-native Dutch L2 learners of English produced more ungrammatical V2 (*PosXVS) structures than the native speakers of English after *PosXVS primes (25% and 29% vs 17%) and PosXSV primes (4% and 8% vs 2%).



	All	L1	L2	L2A	L2NN
PosXSV prime	4,17%	2,08%	6,25%	4,17%	8,33%
*PosXVS prime	21,88%	16,67%	27,08%	25,00%	29,17%

Figure 19. Ungrammatical V2 production according to PosX primes among all groups (error bars: 95% CI)

However, it is striking that the near-natives produced more ungrammatical V2 structures after positive preposed adverbials than the advanced Dutch L2ers of English (cf. ungrammatical V3 in negative preposed adverbials).

An LMER analysis was conducted to examine to what degree factors like Polarity (negative vs positive), Word Order (V2 vs V3), Group (L1 vs L2A vs L2NN) and Awareness

of the experiment (yes vs no) contribute to whether a structure is primed or not. In order to do so the following model was implemented and run in R (see Table 29 for results):

```
fit <- lmer(Primed ~ Polarity * Word Order * Group * Awareness + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

Table 29. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	1.6149	0.6517	2.478	0.013219
Polarity	-2.9298	0.8989	-3.259	0.001117
Word Order	-3.6920	0.9557	-3.863	< 0.001
Group	1.4854	0.8916	1.666	0.095725
Awareness	-1.0449	0.7229	-1.445	0.148345
Polarity*Word Order	7.0731	1.3407	5.276	< 0.001
Polarity*Group	-2.1334	1.0882	-1.960	0.049949
Word Order*Group	-3.1807	1.4850	-2.142	0.032208
Polarity*Awareness	1.4073	1.0082	1.396	0.162759
Word Order*Awareness	-15.6821	2924.5259	-0.005	0.995722
Group*Awareness	-0.5293	1.3314	-0.398	0.690982
Polarity*Word Order*Group	5.5214	2.0049	2.754	0.005887
Polarity*Word Order*Awareness	16.0992	2924.5262	0.006	0.995608
Polarity*Group*Awareness	1.1090	1.7291	0.641	0.521282
Word Order*Group*Awareness	2.2136	4739.5229	0.000	0.999627
Polarity*Word Order*Group*Awareness	11.4626	6007.8022	0.002	0.998478

The AIC, BIC and logLik values for this model were 282.5, 357.6 and -122.3 respectively.

The analysis revealed main effects of Polarity (p=0.001) ,Word Order (p<0.001), but no main effects of Group or Awareness. In addition, the analysis reveals significant interactions between Polarity and Word Order (p<0.001), Polarity and Group (p=0.05), Word Order and Group (p=0.032), and a significant three-way interaction between Polarity, Word Order and Group (p=0.006). As there is no main effect of Group, investigating the interactions between Group and the other factors mentioned is not worthwhile. That leaves the Polarity*Word Order interaction for follow-up comparisons, where the particular focus lies on whether ungrammatical V2 can be primed (i.e. V2 word order after positive preposed adverbials in English).

For all three groups (L2A, L2NN, L1) *t*-tests revealed priming effects of *PosXVS primes on ungrammatical V2 (*PosXVS) target productions. For the advanced L2ers of English 4% *PosXVS target productions after an PosXSV prime increased to 25% *PosXVS target productions after a *PosXVS prime, this increase is just significant: $t(11)=2.171$ (p=0.05). For the near-native Dutch speakers of English the priming effect of *PosXVS on ungrammatical V2 (*PosXVS) productions was highly significant, as *PosXVS target

productions after preposed positive adverbials increased from 8% after PosXSV primes to 29% after *PosXVS primes: $t(11)=3.317$ ($p=0.007$). Even for the native English speakers there was a significant priming effect of *PosXVS primes, as 2% *PosXVS productions after an PosXSV prime increased to 17% *PosXVS productions after a *PosXVS prime: $t(23)=2.598$ ($p=0.016$).

Thus the fixed factors of Polarity and Word Order are significant predictors whether a certain structure can be primed among the participants. However, the Group factor is not a significant predictor, *i.e.* the participant's language group is not a reliable predictor whether a certain structure can be primed, and therefore this model is unable to make any predictions about the direction of priming effects between native speakers of English and Dutch L2 learners of English. In addition, the participant's awareness of the purpose of the experiment was also not a significant predictor whether a particular structure could be primed or not.

5.3.5. Discussion of preposed adverbials of manner

Ungrammatical V3 in sentences with negative preposed adverbials were primed more in the L2 production of Dutch learners of English than in the L1 production of native speakers of English. An explanation for this is that it can be the result of 'overgeneralisation' on the part of the Dutch L2ers. They possess the metalinguistic knowledge that English is not a V2 language and subsequently over-applied V3 word order in those instances where V2 word order is licensed in English. This implies that rather than processing L2 structures hierarchically, where word order is determined by the lexcico-syntactic feaures of other elements in the syntactic tree, the L2 learners adopt a 'Good Enough' linear strategy, where the word order is slotted in the syntactic tree according to a default SVO model no matter what the lexio-syntactic features of the other elements in the sentence are (cf. negative polarity items in preposed adverbials of manner). So the explicit knowledge of English word order can affect syntactic priming of grammatical V2 word order negatively in Dutch L2 learners of English. A typical sequence of events would be: a Dutch L2er is primed with a grammatical V2 structure, in this case a preposed negative adverbial of manner followed by V2 word order, but does not necessarily repeat the word order when having to produce a similar structure. Instead the L2er could produce an ungrammatical V3 structure by over-applying canonical SVO word order as a prescriptive rule after the preposed adverbial. This so-called 'anti-priming' effect can surface because of the saliency of V2 word order in an English construction with preposed adverbials of manner, leading the L2 learner to think that this salient structure must be incorrect as it does not comply with the canonical SVO word order in English.

The majority of English native speakers produced V2 word order after negative preposed adverbials no matter what word order the prime sentence had. Ungrammatical V2 in sentences with positive preposed adverbials was more often primed among the Dutch L2ers than the English L1ers (even more so among the near-natives than the advanced learners). This can be attributed to L1 transfer on the part of the Dutch L2ers since Dutch is a V2 language and requires a verb after a preposed adverbial –no matter what polarity. So L1 knowledge is seeping through into their L2 production, *i.e.* L2ers being unable to suppress their L1 syntax. The issue of real-time access to memory and time resource allocation involving metalinguistic knowledge of lexical-syntactic constraints on V2 word order in English is targeted by the Syntactic Priming Task with digit recall and speeded comprehension and speeded production experiments in the next chapter.

5.3.6. Conclusion

The results of this study showed that when advanced Dutch L2ers of English, even near-native speakers, are primed with ungrammatical V2 word order in sentences starting with a positive preposed adverbial that their subsequent L2 production differs quantitatively and qualitatively from native speakers of English. So, when primed, native speakers of a V2 language like Dutch are more prone to maintaining V2 word order in their L2 English, even when this V2 structure is not licensed.

However, this study also showed that this only applied to positive preposed adverbials and not to locative inversions. So in this instance, Dutch learners of English may not have automatised the lexical dependency of polarity items on word order in online L2 production of sentences starting with preposed adverbials. The results confirm that it is indeed very difficult for L2 learners to become native-like in a second language at certain interfaces –in this particular instance the syntax-lexicon interface. So the prediction made at the start of the experiment that Dutch L2 learners of English are more susceptible to producing ungrammatical V2 word order after being primed with this ungrammatical structure than English native speakers was borne out.

Further research targeting the gradience of V2 structures at the syntax-lexicon interface is needed to generate more conclusive evidence for the interface hypothesis. The next chapter investigates the gradience and *real-time processing* of residual V2 word order after preposed adverbials of manner in more detail; it will do so according to different online methods and by increasing the number of experimental items containing preposed adverbials of manner.

5.4. Comparisons between experiments 3 and 4

5.4.1. Locative inversions

In the offline Magnitude Estimation Task English L1 speakers and Dutch L2 learners behaved similarly on two points with respect to locative inversions: 1) they both accepted locative inversions more in light contexts rather than in heavy contexts, though 2) in heavy contexts locative inversions containing unergatives were preferred over locative inversions with unaccusatives. This is unexpected because unaccusatives do no assign theta roles in a way unergatives would. It was predicted from the start that unaccusatives would be more accepted in locative inversions, since these constructions start out with a non-thematic preposed adverbial of location. However, the Dutch L2 learners rated locative inversions with unaccusatives higher in Dutch and English than the English native speakers did in English.

In addition, Dutch L2 learners' ratings of locative inversions with unaccusatives and unergatives in English were numerically closer to one another than the ratings of these particular structures by English native speakers. An explanation for this is that the Dutch L2 learners were influenced by their L1, because in Dutch locative inversions containing unergatives and unaccusatives are both grammatical, whereas in English predominantly only unaccusatives may appear in locative inversions, and even then locative inversions are much more marked than in Dutch. Though corpus research has shown that in English locative inversions with unaccusatives are more frequent than those with unergatives (Levin & Rappaport Hovav 1995), the results in the offline task showed higher ratings for locative inversions with unergatives for English native speakers.

In order to test whether Dutch L2 learners' and English L1 speakers' preferences are similar under time constraints in online production, we conducted a Syntactic Priming Task targeting locative inversions. This experiment also targets the question whether L2 competence (L2 comprehension in an offline task) equals correct L2 performance (L2 production in an online task) in highly advanced to near-native Dutch L2 learners of English. The results of the online task revealed that both Dutch L2 learners and English L1 speakers were producing more locative inversions containing unaccusative verbs than those containing unergative verbs. This is different from what one would expect from the offline results in the Magnitude Estimation Task, where locative inversions containing unergatives were preferred over those with unaccusatives. In addition, the English native speakers produced *more* locative inversions than the Dutch L2 learners. The materials were kept exactly the same in both experiments, so this cannot be the reason for the discrepancies

between competence and performance. However, there are two explanations available that do not exclude one another:

1) The Dutch L2 learners in the online experiment were not tested on locative inversions in Dutch, but the Dutch L2 learners in the offline task were. Therefore, an increased preference for locative inversions with unaccusatives over those with unergatives overall makes sense as in the online experiment the participants were only tested on English. That is, the Dutch data skewed the preferences for locative inversions towards those structures containing unergatives in the offline experiment as these structures are perfectly fine in Dutch (but not in English). However, English native speakers were not tested on Dutch data in the offline experiment, but showed an increased preference for locative inversions with unergatives over unaccusatives in that experiment.
2) The Dutch L2 learners in the online experiment were near-native Dutch learners of English (lecturers in English at universities in the Netherlands) and subsequently had higher L2 proficiency levels than the very advanced Dutch L2 learners of Dutch in the offline task (BA/MA/PhD students of English). So the increased preference of locative inversions among English native speakers could be relative as it was not the English L1 speakers who differed in their preferences from those in the offline task, but the Dutch L2 learners who did. So, an increased awareness in *explicit* (meta)linguistic L2 knowledge among the Dutch L2 learners could have been the reason why they outperformed English L1 speakers in the online task. In the next chapter, experiments 6-8 address this issue where (meta)linguistic knowledge is blocked by overloading working memory among both L1 and L2 speakers of English.

5.4.2. Preposed adverbials of manner

In the offline Magnitude Estimation Task the Dutch L2 learners of English in general gave higher ratings to all structures (*i.e.* preposed adverbials of manner containing a positive or negative element followed by V2 or V3 word order) than English native speakers did. With respect to the English data both Dutch L2 learners and English L1 speakers rated sentences starting with a preposed adverbial with a negative polarity item followed by a postverbal subject more acceptable than those sentences starting with preposed adverbials with a positive polarity item followed by a postverbal subject (negXVS > *posXVS). In addition, Dutch L2 learners and English L1 speakers agreed that preposed positive adverbials

followed by a preverbal subject were more acceptable than negative preposed adverbials followed by a preverbal subject (posXSV > *negXSV). These findings conform to what one can expect based on prescriptive grammar. However, the most important discovery in the offline Magnitude Estimation Task is that although the Dutch L2 learners are aware of the ungrammaticality of preposed positive adverbials followed by a postverbal subject (*posXVS) they still rated these structures significantly more acceptable than native speakers of English.

The offline data revealed that very advanced Dutch L2 learners were aware of the lexical-semantic constraints that polarity items in preposed adverbials pose on the word order of an English sentence. There was, however, a tendency among the Dutch L2 learners to accept sentences with a Dutch-like (V2) grammar slightly more than English native speakers did. We conducted a follow-up Syntactic Priming Task (experiment 4) to test whether L1 interference in Dutch L2 learners' English may become more predominant in online production when there is no longer ample time to monitor L2 production. So this additional experiment addressed the issue whether learners' L2 competence outperforms their L2 performance.

The results of the online Syntactic Priming Task revealed that Dutch L2 learners of English were primed into producing more ungrammatical sentences starting with a preposed negative adverbial followed by a preverbal subject (*negXSV) than native speakers of English. In addition, Dutch L2ers also produced more ungrammatical sentences starting with a preposed postitive adverbial followed by a postverbal subject (*posXVS) than native speakers of English. These results conform to the results of the offline comprehension task, suggesting that the differences in online production between Dutch L2ers and English L1ers stem from the same source as those in offline comprehension. That is, the Dutch L2 learners adopted a linear processing strategy rather than a hierarchically structured processing strategy, where word order is slotted in the syntactic tree according to a default SVO model no matter what the lexio-syntactic features of the other elements in the sentence were (see section 5.3.5. and discussion below).

An explanation why Dutch L2 learners of English were primed into producing more ungrammatical *negXSV structures than native speakers of English comes in the form of hypercorrection. Advanced Dutch L2 learners of English are aware of the predominant SVO structure English sentences take on and apply this mould to most sentences, even to those exceptions that do not license SVO word order, such as sentences starting with preposed negative adverbials. In these sentences, the presence of the negative polarity item in the preposed adverbial of manner is not taken as a cue for changing word order from SVO to

VSO (as it should because of the negative semantics). On top of this, Dutch L2 learners of English are infrequently exposed to negative inverted V2 structures. So this plays a facilitating part in over-applying canonical SVO word order in those cases where marked V2 word order is called for. In sum, specific (meta)linguistic L2 knowledge of English is overgeneralised and linearly applied in these circumstances.

However, the offline and online data also showed that V2 structures in sentences starting with preposed positive adverbials were successfully primed, where in such sentences one would expect V3 word order because of the earlier mentioned SVO mould. A reason why ungrammatical *posXVS is primed more among Dutch L2 learners than among English native speakers is L1 interference. In Dutch, sentences that start with preposed adverbials are always followed by a verb and then a subject (V2 word order), and unlike English, this is even the case when there is a positive polarity item present in the preposed adverbial of manner. So in Dutch there are no lexical-semantic constraints imposed by polarity items in a preposed adverbial on the word order of the rest of the sentence.

In order to collect more supportive evidence for the theoretical explanations above, we conducted a fifth experiment that is focusing specifically on word order after preposed adverbials of manner (see experiment 5 in the next chapter).

5.5. Chapter summary

This chapter presented empirical data elicited among highly advanced to near-native Dutch learners of English on near-native competence in a Magnitude Estimation Task and near-native performance in a Syntactic Priming Task with respect to V2 word order dependency on lexical-semantic items in the sentence (*i.e.* syntax-lexicon interface structures). The results showed that near-native Dutch learners of English behaved more or less similarly to the native speakers of English in the offline and online tasks targeting locative inversions, but differently on the linguistic structures involving preposed adverbials of manner.

The differences in outcome between the offline and online experiments were discussed as a result of the different linguistic structures tested as well as a result of the methodologies used. Linguistic structures with preposed adverbials of manner showed the most significant differences between advanced-to-near-native Dutch learners of English and native speakers of English, indicating inconsistencies in near-nativeness and nativeness. As a result, we will test these specific structures in more online experiments in the next chapter.

The differences in language competence and performance can partly be attributed to L1 interference and partly to over-application of linguistic L2 knowledge. With respect to de Bot's (1992) bilingual production model one would expect L1 and L2 interference among

very advanced to near-native L2 learners who store and retrieve lexical items and syntactic rules from one processing unit (cf. formulator) rather than separate units per language. In the next chapter we test this conjecture rigouresly by applying extra pressure/workload whilst targeting the same linguistic structure (*i.e.* preposed adverbials of manner). So we will now investigate how exactly online language processing is influenced by restricted access to cognitive resources.

Chapter 6 Preposed adverbials of manner

6.1. Chapter overview

The previous chapter revealed that the most significant differences in comprehension and production between near-native and native speakers of English were found with respect to word order in sentences with preposed adverbials of manner. This chapter focuses entirely on this particular linguistic structure in the online language production and comprehension of very advanced to near-native Dutch learners of English and native speakers of English. The experimental methods used consisted of Syntactic Priming Tasks with and without a Digit Recall Tasks, speeded Grammaticality Judgement Tasks and speeded Sentence Completion Tasks. The results of these experiments are discussed and compared with one another.

6.2. Experiment 5: Syntactic Priming Task

This experiment was a replication of experiment 4 (see previous chapter) as the results of that experiment indicated significant differences between highly advanced to near-native speakers of English and native speakers of English with respect to sentences containing preposed adverbials of manner. The adopted experimental methodology was exactly the same as in experiment 4, though the number of critical items concerning preposed adverbials of manner was increased, and the critical items concerning locative inversions were omitted, in order to elicit more robust results on this specific linguistic structure. In addition, different participants were tested, but with similar backgrounds as the ones in experiment 4. The prediction is that highly advanced Dutch L2 learners of English will be primed into producing more ungrammatical V2 structures than native speakers of English.

6.2.1. Method

Participants

The following groups were tested:

i. An experimental group of 18 Dutch learners of English (age range: 19-33, mean age: 24.8, L2 onset age range: 10-12, mean L2 onset age: 10.7; see Appendix J for individual data). The participants were either academics or alumni from various universities in the Netherlands across different fields of study (but not linguistics or English language). L2 proficiency was controlled for by having these participants

take the grammar part of the Oxford Placement Test (mean score: 85 out of 100, range: 60-99).[22]

ii. A control group of 20 native speakers of English (age range: 20-36, mean age: 24.9; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University, who had not participated in any of the previous experiments reported in this thesis.

Materials

A computerised Syntactic Priming Task was implemented in E-Prime 2.0 in order to examine potential priming effects of grammatical and ungrammatical V2/V3 word order in sentences with preposed adverbials of manner. Twenty-four sentences were designed to correspond with a prime picture or target picture. The prime sentences were divided into:

a) preposed negative adverbials of manner followed by V2 word order, *e.g.* "In no circumstances may you smoke."
b) preposed negative adverbials of manner followed by V3 word order, *e.g.* "*In no circumstances you may smoke."
c) preposed positive adverbials of manner followed by V2 word order, *e.g.* "In some circumstances may you smoke."
d) preposed positive adverbials of manner followed by V3 word order, *e.g.* "In some circumstances you may smoke."

The prime sentences were controlled for the numbers of words (word count) and number of characters (sentence length) between the different experimental conditions. Post-hoc Bonferroni corrected *t*-tests revealed that there are no significant differences in word count (all p values ≥ 0.50) and sentence length (all p values ≥ 0.20) between the different conditions (see Appendix E for full details of these statistics).

An additional sixty-four filler items were added to the item pool: sixteen of them were sentences containing modified noun phrases (*e.g.* "this is the graceful ballerina"), sixteen of them were sentences containing numerals followed by plural nouns (*e.g.* "there are five pencils"), twenty of them were sentences describing objects with respect to location (*e.g.* "two airplanes are flying in the sky"), and twelve of them were sentences that expressed recommendations which participants had to complete themselves (*e.g.* "in case of emergency …").

[22] No main effects of early L2 onset age (p=0.562), having non-native Dutch parents (p=0.917), having stayed in an English-speaking community for more than 6 months (p=0.396) or 3 years (p=N/A) on L2 proficiency.

The experimental and filler items were combined into prime-target pairs such that neither the prime sentence with matching picture nor the target sequence with matching picture where repeated in either a target sequence or a prime sequence. All items were presented once and in random order to the participants in four blocks (see Figure 16 in experiment 4 for an example, and Appendix E for all experimental items). In sum, the experiment is a mixed 2 x 2 x 2 design, consisting of within-participants factors Polarity (negative vs positive) and Word Order (V2 vs V3) and a between-participants factor Group (Dutch L2ers vs English NSs).

Procedure

At the offset of the experiment, participants were informed about their rights and asked to sign a consent form, as well as provide some bio-data regarding age, education, second languages they speak *etc.* (see Appendix I). The participants were instructed that speed is of the essence in the experiment and that they should not linger in producing their responses, but pursue their initial reactions. They were also informed that their reactions were recorded and transcribed for the purposes of the experiment. The participants were first subjected to a practice session of eight item pairs before the experiment started. The participants' production was recorded with a stand-alone Zoom 2 digital voice recorder.

The computerised Syntactic Priming Task consisted of two interrelated subtasks: 1) a Sentence-Picture Matching Task, and 2) a Picture Description Task. In the first subtask participants had to read out loud a phrase that appeared for four seconds in the middle of the computer screen which was either a prime or a filler item. Then they were shown a configuration of pictures that either matched the phrase read out loud, or not. The computer programme waited for input before proceeding to the second subtask. Participants had to type in a 'y' for 'yes', or an 'n' for 'no' to indicate whether the phrase and subsequent picture matched. After the matching task, another configuration of pictures appeared on screen, and participants were expected to describe the scene out loud within four seconds, thereby producing the primed target construction or not.

Analysis

After being subjected to a grammar test from the Oxford Placement Test, only 15 Dutch learners of English scored 75% and above (CEFR C1 level and above).[23] For the analyses, these 15 participants were grouped in a subgroup labelled 'L2A'. All 18 Dutch learners of

[23] As the bio-info on the L2 participants was gathered, six participants refused to take the Oxford Placement Test (see Appendix J). They were still qualitatively assessed on their L2 proficiency based on the L2 productions in the syntactic priming task and oral interactions with the experimenter and subsequently deemed C1 level and above.

English were included in a group labelled 'L2'. No native speakers of English were excluded from the analyses. Table 30 below shows the frequencies and percentages of participants' target productions per language group according to prime.

Table 30. Frequencies and percentages of target responses according to prime

	NegXVS		***NegXSV**		***PosXVS**		**PosXSV**		**Other**	
Prime	*L1*	*L2*	*L1*	*L2*	*L1*	*L2*	*L1*	*L2*	*L1*	*L2*
NegXVS	**47**	**10**	**0**	**27**	**0**	**0**	**0**	**0**	**13**	**8**
	78%	19%	0%	50%	0%	0%	0%	0%	22%	15%
***NegXSV**	**55**	**11**	**4**	**26**	**0**	**0**	**0**	**0**	**1**	**8**
	92%	20%	7%	48%	0%	0%	0%	0%	2%	15%
***PosXVS**	**1**	**0**	**0**	**0**	**7**	**0**	**51**	**42**	**1**	**3**
	2%	0%	0%	0%	12%	0%	85%	78%	2%	6%
PosXSV	**1**	**0**	**0**	**0**	**12**	**0**	**46**	**41**	**1**	**4**
	2%	0%	0%	0%	20%	0%	77%	76%	2%	7%

Figures 20 and 21 graphically illustrate the effects of ungrammatical primes on participants' target productions. Figure 20 examines target ungrammatical V3 production as a result of grammatical V2 and ungrammatical V3 primes in negative preposed adverbials, and Figure 21 examines target ungrammatical V2 production as a result of ungrammatical V2 and grammatical V3 primes in positive preposed adverbials. In these figures 'L2' signifies the entire L2 group (N=18) and 'L2A' the highly advanced to near-native Dutch L2 learners of English (N=15), whose OPT scores were above 75%.

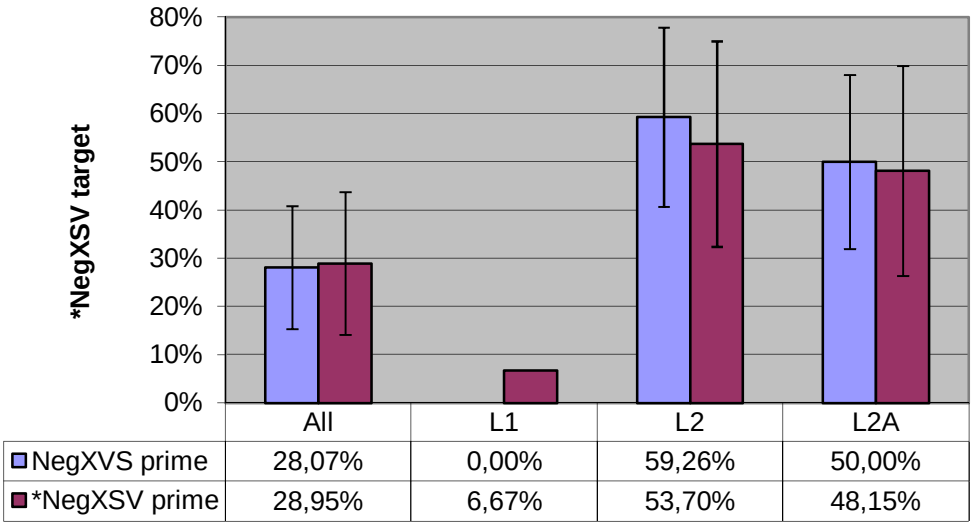
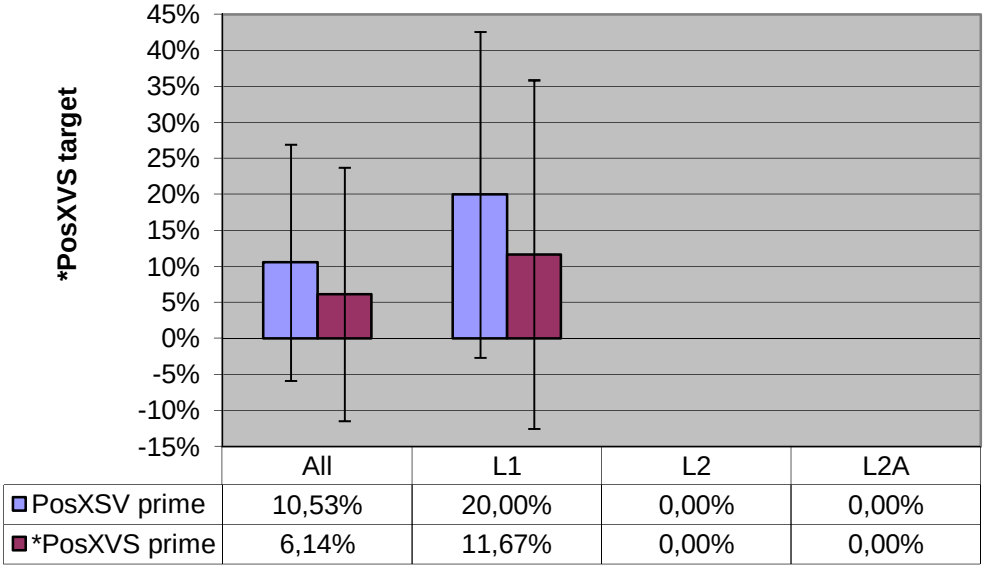


Figure 20. Ungrammatical V3 production according to NegX primes among all groups (error bars: 95% CI)



	All	L1	L2	L2A
PosXSV prime	10,53%	20,00%	0,00%	0,00%
*PosXVS prime	6,14%	11,67%	0,00%	0,00%

Figure 21. Ungrammatical V2 production according to PosX primes among all groups (error bars: 95% CI)

6.2.2. Results

A Logistic Mixed Effect Regression analysis was conducted to examine to what degree factors like Polarity (negative vs positive), Word Order (V2 vs V3) and Group (L1 vs L2 vs L2A) and Awareness of the purpose of the experiment (yes vs no) contribute to whether a structure is primed or not. In order to do so the following model was implemented in R:

```
model <- lmer(Primed ~ Polarity * Word Order * Group * Awareness + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

in which Primed is the dichotomous dependent variable, Polarity, Word Order, Group and Awareness the fixed factors, Participant and Item random factors where participants were divided in subgroups but did see the same items. On top of that this model investigates whether there are interactions between these fixed factors (see Table 31 below for results).

Table 31. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	-1.2283	0.3904	-3.146	0.002
Polarity	-17.4290	1565.3517	-0.011	0.991
Word Order	1.4299	0.5212	2.743	0.006
Group	2.2607	0.4730	4.780	< 0.001
Awareness	0.5029	1.2864	0.391	0.696
Polarity*Word Order	19.7248	1565.3518	0.013	0.990
Polarity*Group	14.5897	1565.3517	0.009	0.993
Word Order*Group	-4.8997	0.7639	-6.414	< 0.001
Polarity*Awareness	-0.4823	6577.1663	0.000	0.999
Word Order*Awareness	-1.4134	1.8022	-0.784	0.433
Group*Awareness	17.0933	3104.6334	0.006	0.996
Polarity*Word Order*Group	-13.2134	1565.3520	-0.008	0.993
Polarity*Word Order*Awareness	17.4807	9063.7240	0.002	0.998
Polarity*Group*Awareness	-33.8854	7907.0524	-0.004	0.997
Word Order*Group*Awareness	-32.3653	4435.0447	-0.007	0.994
Polarity*Word Order*Group*Awareness	32.9532	10556.7194	0.003	0.998

The AIC, BIC and logLik values for this model were 386.5, 464.8 and -174.3 respectively.

The analysis revealed main effects of Word Order ($p=0.006$) and Group ($p<0.001$), and a significant Word Order*Group interaction ($p<0.001$). This means that Word Order and Group are significant predictors whether a particular structure will be primed. On the other hand, Polarity and Awareness of the purpose of the experiment are not significant predictors. Both L1 and L2 speakers acted similarly in sentences starting with positive preposed adverbials, but differently in sentences starting with negative preposed adverbials, *viz.* almost half of L2 speakers' production followed these adverbials up with V3 word order, whereas the English native speakers stuck to the grammatically licensed V2 word order (see Table 30).

The Word Order*Group interaction confirms that when primed with certain word order, this affected participants in one language group more than in the other language group. In order to establish what the differences in priming effects as a result of word order primes are between Dutch L2 learners of English and native speakers of English, the following post-hoc comparisons were carried out. A paired samples t-test reveals that among the Dutch L2 learners of English the primed outcome of a structure differed significantly when participants were primed with preverbal subject (XSV) structures as opposed to postverbal subject (XVS) structures: $t(35)=-7.0586$ ($p<0.001$), whereas this was not the case for native speakers of English: $t(39)=0.248$ ($p=0.8054$). This sensitivity towards word order primes among the Dutch L2ers concerned mainly their response towards *ungrammatical* primes. Figures 20 and 21 illustrate that Dutch L2ers produced more ungrammatical V3 structures and less ungrammatical V2 structures than English native speakers. A paired

samples t-test confirmed this difference is significant: $t(19)=5.405$ ($p<0.001$). However, one cannot speak of a priming effect of negative adverbials with V3 as Dutch L2ers did not significantly produce more of this type of structure after a V3 prime than a V2 prime. In fact they produced less V3 structures after a negative V3 prime than after a negative V2 prime (48% vs 50% respectively).

So the results revealed no priming effects for L2 learners, and a slight increase in ungrammatical V3 production after a *NegXSV prime compared (within-subjects) to a NegXVS prime among L1 speakers (0 to 6%). Nevertheless, a between-subjects comparison revealed that Dutch L2ers' ungrammatical V3 production was significantly elevated after primes with negative preposed adverbials compared to native speaker V3 production, and that Word Order of the prime sentence in general proved to be a significant predictor whether a particular structure was produced. The general discussion deals with this issue in more detail.

6.2.3. Discussion

In general, most native speakers of a language are conscious of ungrammatical productions and depending on real-time constraints will most likely recast the ungrammatical production into an unmarked one. However, under sufficient stress ungrammaticalities could be repeated due to limited time to respond and produce, and so-called priming effects ensue. The chances of this happening are greater for those who have fewer resources at their disposal, those who cannot come up with a grammatical equivalent target production in time. Subsequently, one would expect this to occur more among L2 learners of a language than native speakers of that language, especially when the ungrammatical L2 structure is grammatical in the learner's L1.

In this experiment, participants from all the language groups predominantly produced grammatical target structures upon being primed with ungrammatical primes. However, the one exception to this was ungrammatical negative preposed adverbials of manner followed by V3. Here Dutch L2 learners did produce significantly more ungrammatical V3 word order after sentences starting with a negative preposed adverbial than the native speakers of English. This phenomenon cannot be a result of L1 transfer as negative preposed adverbials are followed up by V2 word order in Dutch by default. In addition, Dutch L2 learners did not produce ungrammatical V2 in sentences that started with positive preposed adverbials. Thus, Dutch learners of English did not transfer V2 in their L2 production at all, but did overextend V3 word order in sentences starting with negative preposed adverbials.

In contrast to the Dutch L2 learners, the native speakers of English could be enticed into producing ungrammatical V2 word order after a preposed adverbial of manner containing a positive polarity item. Still, one cannot speak of a priming effect as there was less ungrammatical V2 than grammatical V3 target production after an ungrammatical V2 prime (12% and 85% respectively, see Table 30).

6.2.4. Conclusion

No priming effects were found in all language groups concerning prime sentences with either negative or positive preposed adverbials with differing word orders. So the prediction regarding primeability of ungrammatical V2 word order among Dutch L2ers was not borne out. However, Dutch L2ers did produce significantly more ungrammatical V3 structures after a negative preposed adverbial than English native speakers. This cannot be a result of L1 transfer as these structures in Dutch would have been V2, but could be interpreted as some form of overextending the more or less 'fixed' English SVO structure (V3) after negative preposed adverbials. A possible explanation for this would be that ungrammatical V3 word order in the context of negative preposed adverbials is a result of a 'Good Enough' linear approach (or hypercorrection) on the part of Dutch L2ers as they possess the metalinguistic knowledge that English is not a V2 language, and therefore may overuse V3 in those instances where V2 is licensed in English.

The majority of English native speakers produced V2 word order after negative preposed adverbials regardless of the word order the prime sentence had. The overall outcome of this experiment confirms that interface phenomena appeared among highly advanced L2 learners at the syntax-lexicon interface, though these non-native-like utterances came in different realisations than was predicted (i.e. hypercorrection instead of transfer).

6.3. Comparisons between experiments 4 and 5

The results of the online Syntactic Priming Task described above were different from the results in the Syntactic Priming Task described in the previous chapter. The difference here was that the English native speakers produced more ungrammatical sentences starting with a preposed positive adverbial followed by a postverbal subject (*posXVS) than the Dutch L2 learners of English did. In fact, the Dutch L2 learners did not produce a single *posXVS structure, thereby falsifying the hypothesis that for the particular structure of sentences starting with preposed positive adverbials Dutch L2 learners' L1 grammar may seep through in their L2 syntax at the syntax-lexicon interface. All components of experiments four and five were maintained as similar as possible except for:

1) a difference in the composition of the experimental group;
   In the former online task older near-native Dutch L2 learners of English were tested, whereas in the latter online task younger highly advanced Dutch L2 learners of English were tested. The difference in proficiency, age and L2 experience could have had an effect on susceptibility to priming.
2) a difference in the ratio experimental items:filler items;
   In the second online priming task more experimental items were added to the item pool in order to pursue a more robust priming effect. However the number of filler items did not increase in equally matched proportions as the experimental items. The relatively higher increase in experimental items could have led to the Dutch participants 'seeing through' the purpose of the experiment, and thereby avoid producing L1-like ungrammatical *posXVS structures.

However, some results of experiment 4 were replicated in experiment 5, *viz.* Dutch L2 learners of English did produce more ungrammatical sentences starting with a preposed negative adverbial followed by a preverbal subject (*negXSV) than native speakers of English did. These results are supportive of a theory that proposes hypercorrection towards *negXSV word order among Dutch L2 learners, as a possible result of overextending metalinguistic L2 knowledge about SVO word order in English through linear processing strategies.

6.4. Experiment 6: Syntactic Priming Task with Digit Recall Task

Experiments 4 and 5 revealed that highly advanced to near-native Dutch L2 speakers of English accepted and produced ungrammatical V3 word order after preposed adverbials of manner containing a negative polarity item on significantly more occasions than native speakers of English. This result cannot be due to L1 transfer as Dutch does not allow V3 word order under those circumstances (it is V2 by default). In the discussion sections of the previous experiments we put forward an explanation for ungrammatical V3 word order in L2 comprehension and production as a consequence of overextending canonical SVO word order after preposed adverbials of manner, even if they do contain negative polarity items (*NegXSV). In order to pursue the role of working memory and how it affects linguistic knowledge under stressed conditions, we adopted a Syntactic Priming Task with an additional Digit Recall Task to pressurise the participants' working memory, thereby implicitly preventing them from carefully monitoring their production. The prediction is that

Dutch L2 learners of English will be primed into producing more ungrammatical V3 structures than English L1ers after negative preposed adverbials of manner as a result of adopting a linear processing strategy, where canonical SVO word order is appended after preposed adverbials of manner no matter what the polarity of the preposed adverbials are.

6.4.1. Method

Participants

The following groups were tested:

i. An experimental group of 22 Dutch learners of English (age range: 21-65, mean age: 34.9, L2 onset age range: 6-12, mean L2 onset age: 10.3; see Appendix J for individual data).[24] The participants were carefully screened on L2 proficiency by means of an Oxford Placement Test (mean score: 82 out of 100, range: 68-99).

ii. A control group of 22 native speakers of English (age range: 18-35, mean age: 21.8; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University, who had not participated in any of the previous experiments reported in this thesis.

Materials

A computerised Syntactic Priming Task with an incorporated Digit Recall Task was implemented in E-Prime 2.0 in order to examine potential priming effects of grammatical and ungrammatical V2/V3 word order under stressed conditions. The experimental items and filler items were identical to the ones used in experiment 5 (see materials section in 6.2.1. and Appendix E for all experimental items and their statistics).

Procedure

Before the experiment started, participants were asked to sign a consent form and fill in a bio-data questionnaire (see Appendix I). The participants were instructed not to linger in their responses to the tasks at hand, and were informed that their responses were recorded and transcribed for the purposes of the experiment. The participants were first subjected to a practice session of eight item pairs before the experiment started. The participants' production was recorded with a stand-alone Olympus memo voice recorder.

[24] The L2 participant who reported an L2 onset age of 6 did not receive *formal instruction* on L2 English until after the age of 8, but had their first L2 *exposure* at age 6 (as was later confirmed through oral communication). There were no main effects of early L2 onset age (p=0.862), having non-native Dutch parents (p=0.592), having stayed in an English-speaking community for more than 6 months (p=0.238) or 3 years (p=0.550) on L2 proficiency of the L2 participants in this experiment.

The procedure of the computerised Syntactic Priming Task was similar to the one in experiment 5, but with an additional Digit Recall Task. Upon each trial the participants had to perform five subtasks: 1) memorise a randomly generated three-digit number that was presented on the screen for only one second, 2) read out loud a prime sentence that appeared on screen for four seconds, 3) verify whether the picture following the prime sentence depicted what was read out loud by inputting 'y' for 'yes' or 'n' for 'no' on the keyboard, 4) describe a complete new picture out loud within four seconds, 5) recall the memorised three-digit number and type it in with the keyboard. The computer programme waited for as long as it would take participants to type in the three-digit number before repeating the sequence of these five subtasks. The Picture Description Task (subtask 4) elicited sentences with preposed adverbials in exactly the same way as in experiment 5 (by means of traffic signs, ticks, crosses and incomplete utterances).

Analysis

After being subjected to the grammar part of the Oxford Placement Test, only 16 out of 22 Dutch learners of English scored 75% and above (CEFR C1 level and above). As this score seems to reflect the general knowledge of L2 grammar, and therefore could impact the knowledge of lexical-semantic constraints on V2 structures, six Dutch learners of English were excluded from the statistical analyses when it deals with highly proficient Dutch learners of English (L2A) as opposed to Dutch learners of English (L2).

Table 32 below shows the frequencies and percentages of participants' target productions according to prime. The data shows that advanced Dutch L2 learners of English produced a relatively high number of ungrammatical V3 structures after negative preposed adverbials regardless of the grammaticality of the prime word order (NegXVS or *NegXSV). It also shows that native speakers of English produced a substantial number of ungrammatical V2 structures after positive preposed adverbials regardless of the grammaticality of the prime word order (PosXSV or *PosXVS). This was the same as in experiment 5.

Table 32. Frequencies and percentages of target responses according to prime per group

	NegXVS		*NegXSV		*PosXVS		PosXSV		Other	
Prime	*L1*	*L2A*	*L1*	*L2A*	*L1*	*L2A*	*L1*	*L2A*	*L1*	*L2A*
NegXVS	**53**	**24**	**7**	**14**	**0**	**0**	**0**	**0**	**6**	**10**
	80%	50%	11%	29%	0%	0%	0%	0%	9%	21%
***NegXSV**	**55**	**31**	**6**	**14**	**0**	**0**	**0**	**0**	**5**	**3**
	83%	65%	9%	29%	0%	0%	0%	0%	8%	6%
***PosXVS**	**0**	**0**	**0**	**0**	**7**	**3**	**54**	**44**	**5**	**1**
	0%	0%	0%	0%	11%	6%	82%	92%	8%	2%
PosXSV	**1**	**0**	**0**	**0**	**8**	**0**	**53**	**48**	**4**	**0**
	2%	0%	0%	0%	12%	0%	80%	100%	6%	0%

Figures 22 and 23 graphically illustrate the effects of ungrammatical primes on participants' target productions. Figure 22 shows target ungrammatical V3 production as a result of grammatical V2 and ungrammatical V3 primes in negative preposed adverbials, and Figure 23 shows target ungrammatical V2 production as a result of ungrammatical V2 and grammatical V3 primes in positive preposed adverbials. In these figures 'L2' signifies the entire L2 group (N=22) and 'L2A' the highly advanced to near-native Dutch L2 learners of English (N=16).

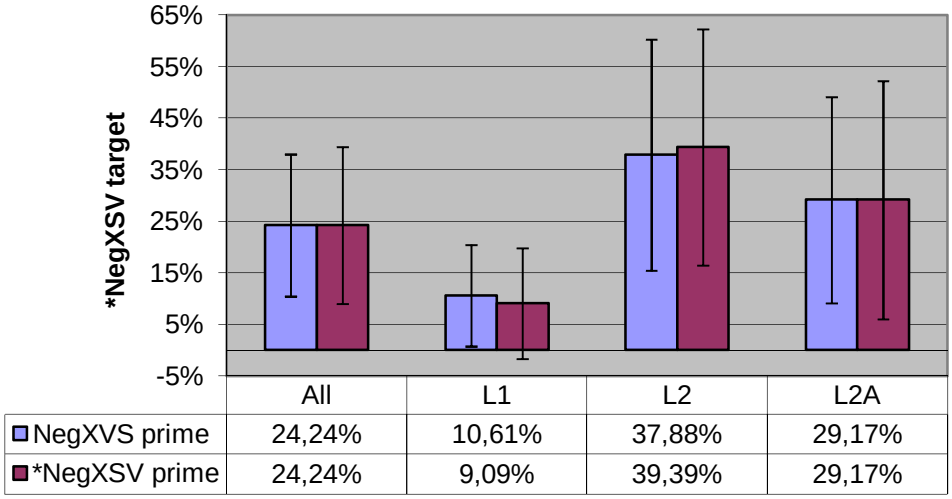
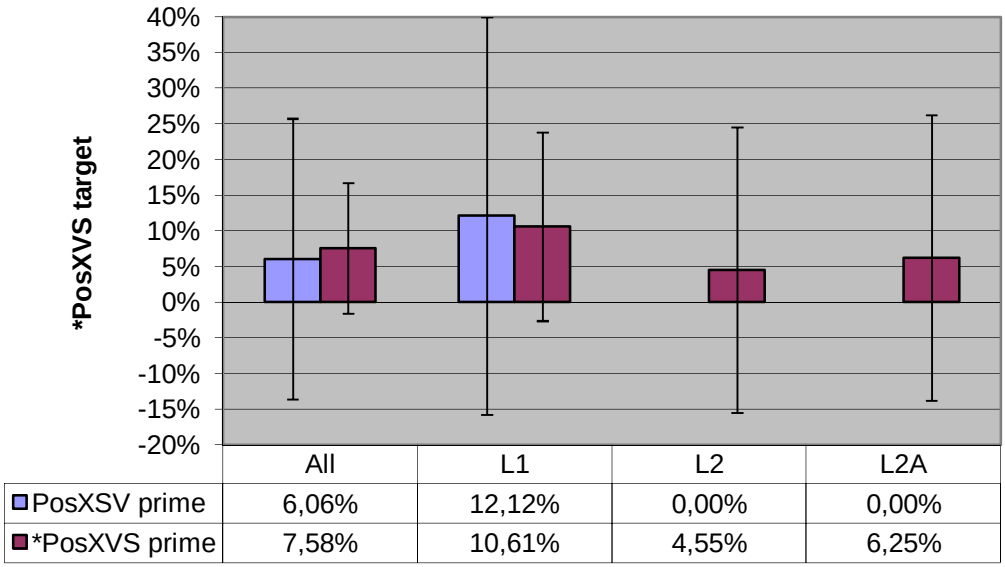


Figure 22. Ungrammatical V3 production according to NegX primes among all groups (error bars: 95% CI)



	All	L1	L2	L2A
PosXSV prime	6,06%	12,12%	0,00%	0,00%
*PosXVS prime	7,58%	10,61%	4,55%	6,25%

Figure 23. Ungrammatical V2 production according to PosX primes among all groups (error bars: 95% CI)

6.4.2. Results

A Logistic Mixed Effects Regression model was fitted to the data with fixed factors Polarity, Word Order, Language Group and random factors Participant and Item (participants divided in groups), where the random factor Participant was crossed with Proficiency (*i.e.* the random slope is different for each individual participant because of differences in proficiency scores). In order to avoid collinearity with other predictors, the continuous L2 learners' Oxford Placement Test Proficiency scores were centred on its grand mean value (*i.e.* the mean proficiency score of the L2 learners was subtracted from each individual proficiency score).[25] The proficiency scores for the native speakers of English were set to 100 as a default. So the native speakers' centred proficiency scores were 0 (100-100). This resulted in the following LMER model in R, where the dichotomous dependent variable is Primed (true or false), see Table 33 for the subsequent analysis:

```
fit <- lmer(Primed ~ Polarity * Word_Order * Group + (Proficiency|Group/Participant) + (1|Item), data = d, family="binomial")
```

[25] In the previous LMER analyses centering of independent variables was not necessary as they were all binary. As the OPT proficiency score is continuous in this model, we centered this variable to avoid collinearity.

Table 33. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	-0.6132	0.3153	-1.945	0.052
Polarity	-2.6309	0.6930	-3.796	< 0.001
Word Order	0.1464	0.4046	0.362	0.717
Group	2.1276	0.4505	4.722	< 0.001
Polarity*Word Order	7.0739	1.1388	6.212	< 0.001
Polarity*Group	-1.1496	0.8544	-1.346	0.178
Word Order*Group	-4.1016	0.6635	-6.182	< 0.001
Polarity*Word_Order *Group	0.6576	1.3512	0.487	0.626

The AIC, BIC and logLik values for this model were 456.8, 520.9 and -213.4 respectively.

The LMER analysis reveals significant main effects of Polarity ($p<0.001$) and Group ($p<0.001$), and significant interactions between Polarity and Word Order ($p<0.001$) and Word Order and Group ($p<0.001$). The interpretations of these results are discussed below.

6.4.3. Discussion

The directions of the effects can easily be interpreted from Figures 22 and 23. The main effect of Group is carried by the fact that native speakers of English produced significantly less ungrammatical V3 structures after negative preposed adverbials (10%) than L2 learners whether they were primed with this structure or not (35%): $t(21)= 3.097$ ($p=0.005$). So the main effect of Group indicates a significant difference in the primed outcome between L2ers and L1ers.

The significant two-way Polarity*Word Order and Word Order*Group interactions indicate that word order and polarity of the prime sentences make a significant contribution to which structures are primed among the L2ers and L1ers in general, and the influence of word order on priming certain structures among the language groups specifically. Of these interactions the latter is more interesting for the purposes of this research (i.e. the difference in susceptibility to priming between near-native and native speakers). A follow-up to this interaction revealed that L2 learners produced significantly more ungrammatical V2 when primed with ungrammatical V2 word order than when primed with grammatical V3 word order: $t(21)=-16.672$ ($p<0.001$) than native speakers of English. In short, the L2ers were more susceptible to priming of ungrammatical V2 than the L1ers. This confirms our prediction in Chapter 2 (section 2.9) that near-native Dutch L2 learners of English could still show L1 interference in their L2 production after being primed with L1-like structures (i.e. V2 word order) in their L2 English.

6.4.4. Conclusion

The most important conclusions that can be drawn from the results of this experiment are: 1) L1 V2 word order is not effectively inhibited by advanced and highly advanced Dutch L2 learners of English as they can be primed into producing ungrammatical V2 structures after preposed adverbials of manner containing a positive polarity item, and 2) canonical English SVO word order is overextended by advanced and highly advanced Dutch L2 learners of English, even in those exceptional cases in English where V2 word order is permitted, as these L2 learners produce ungrammatical V3 word order after preposed adverbials containing a negative polarity item, irrespective of the word order in the prime sentence. So the prediction that Dutch L2 learners of English are *primed* into producing more ungrammatical V3 word order after negative preposed adverbials of manner than English native speakers was not borne out, as the L2ers produced ungrammatical V3 after negative preposed adverbials of manner regardless of the prime structure. However, this does confirm that Dutch L2 learners adopt a linear processing strategy in which they append canonical SVO word order after (negative) preposed adverbials of manner.

This experiment was in all aspects the same as the previous experiment (experiment 5) except for the added Digit Recall Task. As all other factors were *ceteris paribus*, even the demographics of the participant groups in both experiments were relatively similar, the differences in number of successfully primed target productions between the participants in both experiments can only be attributed to the memory overload as a result of the added Digit Recall Task. What follows is a brief comparison between the experiments and an interpretation of the results.

6.5. Comparison between experiments 5 and 6

The descriptive statistics show that among the native speakers of English ungrammatical V3 structures after negative preposed adverbials (*NegXSV) were more primed in the Syntactic Priming Task with digit recall than in the one without digit recall (9.09% vs 6.67%). In addition, in the Syntactic Priming Task without digit recall no ungrammatical V3 structures were produced at all by the native speakers of English after a grammatical V2 prime, but they were in the Syntactic Priming Task with digit recall (0% and 10.61% respectively). In both Syntactic Priming Tasks ungrammatical V3 was much more produced by Dutch L2ers as opposed to native speakers of English regardless of the prime. This could indicate unawareness of residual V2 constraints in English by the Dutch learners of English (as confirmed by the results of the Magnitude Estimation Task in experiment 3), or alternatively the unavailability of non-canonical V2 structures in *online* L2 production. In addition, highly

advanced Dutch L2 learners of English were also more primed into producing ungrammatical V2 structures after preposed positive adverbials (*PosXVS) in the Syntactic Priming Task with digit recall than in the task without digit recall (6.25% vs 0% for L2A).

So when memory resources are overloaded via a Digit Recall Task, native speakers of English were less rigid in grammatical residual V2 structures in English, resulting in more ungrammatical *NegXSV productions in total. An explanation for this could be that this is the result of limited access to cognitive resources as the added memory load prevented the native speakers from carefully monitoring their production, thus resulting in more ungrammatical productions. The Dutch L2 production of *NegXSV structures, regardless of the prime and whether memory resources were overloaded or not, remained high, indicating a more structural deficiency in *online* production, that is the inability to supress prescriptive SVO word order, even in exceptional cases where VSO (V2) word order is licensed.

In sum, upon memory overload Dutch L2ers were primed into producing more ungrammatical V2 after preposed adverbials containing positive polarity items. However, they could not be primed into producing this ungrammatical structure in the Syntactic Priming Task without digit recall. This could indicate that V2 transfer (or the inability to inhibit L1 grammar word order rules) does occur under stressed induced conditions. In previous experiments is has already been established that the Dutch L2 learners rated these structures more acceptable than the native speakers of English (Magnitude Estimation Task in experiment 3) and that they could be primed into producing ungrammatical V2 after a *PosXVS prime (Syntactic Priming Task in experiment 4).

6.6. Experiment 7: Speeded Grammaticality Judgement Task

This experiment was designed to test online access to lexico-syntactic knowledge of verb order constraints after preposed adverbials of manner. The Grammaticality Judgement Task was speeded in order to elicit online unmonitored comprehension, *i.e.* participants' initial responses, after it was concluded from the results that highly advanced to near-native Dutch learners of English still had ample time to monitor their comprehension judgements in the previous timed Magnitude Estimation Task (experiment 3). The prediction for this experiment is that Dutch L2 learners of English judge ungrammatical word order (V2/V3) after preposed adverbials of manner more often grammatical than native speakers of English as a result of a lack of cognitive and computational resources available to them.

6.6.1. Method

Participants

The following groups were tested:

i. An experimental group of 18 Dutch learners of English (age range: 18-32, mean age: 21.5, L2 onset age range: 7-13, mean L2 onset: 10.6; see Appendix J for individual data).[26] The participants were BA students of English Language and Linguistics at Radboud University Nijmegen and were selected by lecturers who diagnosed them to pass for C1 proficiency level (CEFR) in their second language.

ii. A control group of 22 native speakers of English (age range: 20-46, mean age: 27.1; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University, who had not participated in any of the previous experiments reported in this thesis.

Materials

The speeded Grammaticality Judgement Task consisted of ninety-two items that had to be judged under considerable time pressure (two-and-a-half seconds per item), of which sixty were filler items and thirty-two were experimental items divided over four conditions (eight items per experimental condition). The experimental conditions were the same as for the previous experiments on preposed adverbials of manner (NegXVS, *NegXSV, *PosXVS, PosXSV), though different sentences were adopted that not only started with a conditional adverbial of manner but also ended in an adverbial of location or time. See sentences (a) to (d) below for example sentences of the four different experimental conditions (all items can be found in Appendix F).

a) Under no condition should you lose control in public. (NegXVS)
b) Never before I have kissed a man underneath the mistletoe. (*NegXSV)
c) On several occasions have the boxers fought outside the ring. (*PosXVS)
d) In certain circumstances he is allowed to drive his car at night. (PosXSV)

The items were presented in a pseudo-randomised order in four blocks of twenty-three items. The items were controlled for the number of words (word count) and number of characters (sentence length) and there were as many grammatical as ungrammatical items.

[26] As the participants were already carefully handpicked by professional language educators on their equivalent L2 proficiencies, the subsequent statistical analyses are bound to show no differences of external factors on L2 proficiency . As expected, there were no main effects of early L2 onset age (p=0.553), having non-native Dutch parents (p=0.337), having stayed in an English-speaking community for more than 6 months (p=0.846) or 3 years (p=N/A) on the L2 participant's L2 proficiency.

Post-hoc Bonferroni corrected *t*-tests revealed no significant differences in word count (all p values > 0.90) and sentence length (all p values ≥ 0.03; Bonferroni corrected critical p value is 0.0125) between the different conditions. See Appendix F for full details of these statistics.

There were four versions of the Grammaticality Judgement Task designed according to a Latin Square design. Like experiments 4-6, the experiment is a mixed 2 x 2 x 2 design, consisting of within-participants factors Polarity (negative vs positive) and Word Order (V2 vs V3) and a between-participants factor Group (Dutch L2ers vs English NSs).

Procedure

The participants were asked to read and sign a consent form before the experiment as well as fill in a questionnaire regarding their bio-data such as age, education *etc.* (see Appendix I).

The speeded Grammaticality Judgement Task for this study was programmed in E-prime 2.0. Participants were presented with ninety-two sentences (forty-six grammatical and forty-six ungrammatical) and were asked to pass their judgement regarding the grammaticality of these sentences within a brief time window of two-and-a-half seconds after the onset of appearance of the sentence on screen. They were informed only to pay attention to the structure of the sentence and not to the meaning. Several pilot trials were conducted to discover that two-and-a-half seconds was the ideal time window in which participants were pressurised to react instinctively to the sentence, *i.e.* having just enough time to read and judge a sentence.

Participants were instructed to judge sentences by hitting the 'z' key when they thought the sentence was grammatical, and hitting the 'm' key when they thought it was not, while the sentence was still on screen. Throughout the presentation of the sentences the word 'grammatical' was shown in the bottom left corner of the computer screen (coinciding with the position of the 'z' key on the qwerty keyboard lay-out of the laptop this task was run on), and the word 'ungrammatical' was shown in the bottom right corner of the computer screen (coinciding with the position of the 'm' key on the keyboard lay-out). The 'z' and 'm' responses were later coded as 'grammatical' and 'ungrammatical' responses again. The responses were still recorded 1 second after the stimulus disappeared from the screen, as to diminish data loss in case the participants reacted too slowly. A failure to respond, or no response recorded during this time period, resulted in data loss.

The sentence presentations were preceded by a blank screen for half a second followed by a fixation cross for half a second. At the end of each block participants were given feedback on how they were performing the task (x% correct, x% incorrect in a pie

chart), as this would encourage them to be as accurate as possible in their judgements. The font used for the sentences to be judged was Courier New size 20.

The task described above was part of a bigger within-subjects experiment, where the participants not only had to do the speeded Grammaticality Judgement Task but also a speeded Sentence Completion Task (see experiment 8). The order of which task was administered first was counter-balanced by means of four different versions. There were practice sessions of twelve items before each of these tasks. After these practice sessions, participants were given ample time and opportunities to ask the experimenter any practical questions they had.

6.6.2. Results

Three participants (one L2er, two L1ers) who failed to produce a response in more than 20% of the cases were excluded from the analyses. Table 34 below is an overview of the participants' correct judgements according to condition (*i.e.* the percentage of correct grammaticality judgements of the different experimental items per condition).

Table 34. Percentages correct grammaticality judgements per experimental condition

	NegXVS	**NegXSV*	**PosXVS*	*PosXSV*
Dutch L2ers	80.88%	29.41%	32.35%	80.88%
English L1ers	88.13%	57.50%	27.50%	74.38%

Table 34 reveals a large discrepancy in speeded grammaticality judgement responses between Dutch L2ers and English L1ers regarding ungrammatical V3, *i.e.* only in 29% of the cases were the Dutch L2ers able to identify these structures as ungrammatical, whereas 58% of the English L1ers were able to judge the structures as ungrammatical. This discrepancy is graphically illustrated in Figure 24 below, where it shows that the English L1ers in general rated *NegXSV structures less grammatical than the Dutch L2ers as one can see by the lower mean judgement values (where 0 means ungrammatical and 1 means grammatical).

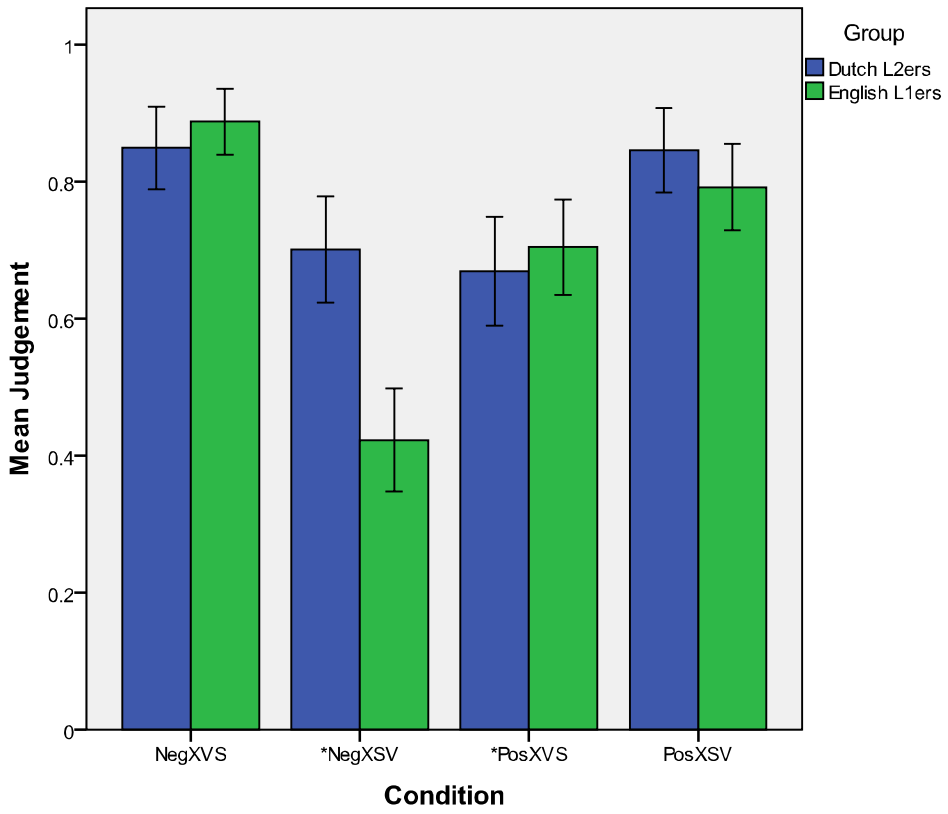


Figure 24. Mean judgements per experimental conditions among the different groups (error bars: 95% CI)

A Logistic Mixed Effects Regression model similar to the model adopted in experiment 5 was fitted to the L1 and L2 English data, where the dependent variable was a dichotomous variable Correct Judgement and the predictors were Polarity, Word Order and Group, with random effects Participant and Item (see LMER analysis in Table 35 below):

```
fit <- lmer(Correct ~ Polarity * Word Order * Group + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

Table 35. LMER analysis of the fitted model

	Estimate	*Std. Error*	*z value*	*p value*
(Intercept)	1.4652	0.2264	6.472	< 0.001
Polarity	-2.2157	0.2867	-7.728	< 0.001
Word Order	-2.3543	0.2898	-8.123	< 0.001
Group	0.5681	0.3343	1.700	0.089
Polarity*Word Order	4.5679	0.4078	11.201	< 0.001
Polarity*Group	-0.8031	0.4182	-1.921	0.055
Word Order*Group	0.6274	0.4130	1.519	0.129
Polarity*Word_Order *Group	-0.7709	0.5638	-1.367	0.172

The AIC, BIC and logLik values for this model were 1327, 1383 and -652.4 respectively.

The analysis confirmed significant main effects of Polarity ($p<0.001$) and Word Order ($p<0.001$), a significant Polarity*Word Order interaction ($p<0.001$) and a marginally significant Polarity*Group interaction ($p=0.055$). This means that the Polarity and Word Order of the experimental sentences with preposed adverbials were significant predictors whether a participant judged a sentence grammatical or ungrammatical.

Even though there was only a marginal interaction with Group, it is worth mentioning that a follow-up t-test confirmed there was a significant difference in grammaticality judgements between Dutch L2ers and English L1ers regarding the *NegXSV structure, *i.e.* the Dutch L2ers judged this ungrammatical V3 structure as being grammatical more often than the English L1ers: $t(36)=-4.697$ ($p<0.001$). No other significant differences were found between L1 and L2 comprehension of the other experimental structures.

6.6.3. Discussion

The results reported above revealed that Dutch L2ers displayed non-native-like grammaticality judgements with respect to ungrammatical V3 after preposed adverbials of manner containing a negative polarity item. When comparing the grammaticality judgements of the Dutch L2ers from this experiment to the magnitude estimation judgements of the Dutch L2ers in the offline task (experiment 3), one can see that ungrammatical V3 word order was accepted more often under time pressure than when it was not under time pressure. In the speeded Grammaticality Judgement Task only 29% of the Dutch L2ers identified ungrammatical V3 as being ungrammatical, whereas in the offline Magnitude Estimation Task this was 80%. So 71% accepted ungrammatical V3 in the speeded Grammaticality Judgement Task and only 20% accepted ungrammatical V3 in the offline Magnitude Estimation Task. The difference in percentages correct between grammaticality judgements and magnitude estimations of the native speakers of English was less dramatic. Native speakers of English accepted ungrammatical V3 in 42% of the cases in the speeded Grammaticality Judgement Task and only 22% in the offline Magnitude Estimation Task (58% vs 78% correctly identified ungrammatical V3 word order). So time pressure has a significant effect on grammaticality judgement outcome among L2 learners and to a lesser extent to L1 speakers. This could be a result of working memory (in)accessibility as we will discuss in more detail in the next chapter. We will argue in the next chapter that having to deal with two languages simultaneously, even when one of the languages is dormant (in the case of L2 learners), takes up more working memory and leaves less memory resources available than when only having to deal with one language (as is the case with monolingual native speakers of English for example).

6.6.4. Conclusion

This experiment was conducted in order to investigate how Dutch learners of English and native speakers of English are affected by cognitive limitations induced by time pressure in their language comprehension of certain linguistic structures at the syntax-lexicon interface (*i.e.* how polarity items in preposed adverbials of manner influence sentence word order).

The results showed that only the lexico-syntactic dependency of exceptional V2 word order in English after preposed adverbials of manner containing negative polarity items was judged non-native-like among the Dutch learners of English. That is, Dutch learners of English failed to recognise this exceptional case of V2 word order under considerable time pressure, and instead judged ungrammatical V3 (SVO) word order as grammatical under these circumstances.

However, the results from previous (offline) experiments show that highly advanced Dutch learners of English are aware of this exceptional V2 word order in English. So rather than being a result of divergent underlying grammatical representations, this outcome can be attributed to inefficient language processing as a result of increased cognitive load. Inefficient language processing here manifested itself in overextending learned knowledge about English word order in these particular circumstances (SVO word order by default) rather than applying the rule of exceptional V2 word order (licensed by the presence of a negative polarity item in the preposed adverbial of manner). This processing strategy is an instantiation of the 'Good Enough' approach to language production, where the Dutch L2ers resorted to linear strategies of slotting V3 word order after every preposed adverbial of manner instead of hierarchically building a syntactic tree dependent on lexico-syntactic items in the preceding context (i.e. lexical features of polarity items in preposed adverbials of manner).

We can establish for certain that the non-native-like acceptability of *NegXSV structures is not a result of L1 transfer, or an inability to inhibit L1 grammar in L2 processing, as this would rather facilitate dismissing *NegXSV structures as being ungrammatical (V2 word order being the default in Dutch). So the prediction that Dutch L2 learners of English judge ungrammatical word order after preposed adverbials of manner more often grammatical than native speakers of English was borne out only for ungrammatical V3 structures, but not for ungrammatical V2 structures. The next section compares the results of this comprehension experiment with the results of our previous comprehension experiment in more detail.

6.7. Comparisons between experiments on comprehension (experiments 3 and 7)

Similar to the previous comprehension task on preposed adverbials (experiment 3) Dutch L2ers accepted ungrammatical V3 (*NegXSV) more than the native speakers of English. In both experiments a significant interaction was found between Polarity and Word Order. In the offline task (experiment 3) Dutch L2ers accepted ungrammatical V2 structures roughly the same number of times than ungrammatical V3 structures, but in the online task (experiment 7) Dutch L2ers were found to accept ungrammatical V3 structures on more occasions than ungrammatical V2 structures. This discrepancy cannot be attributed to L1 transfer as a result of time constraints as V3 is not grammatically licensed in Dutch after preposed adverbials of manner, no matter what polarity the adverbial is.

The difference in acceptance of ungrammatical V3 between the two experiments could be attributed to the methodology adopted. In experiment 3 the participants had to give their magnitude estimation within six seconds, which proved to be just enough time to elicit a carefully monitored initial response to the presented materials, whereas in experiment 7 participants only had two-and-a-half seconds to respond to the materials. As a result of this time pressure the Dutch L2ers fell back on learned knowledge and not on their L1 grammar. So in judging the ungrammatical V3 structures as grammatical they condoned these structures by over-applying prescriptive SVO word order. As for the other ungrammatical structure (*PosXVS), the acceptance of this ungrammatical V2 structure was higher among Dutch L2ers than English L1ers in both experiments, though this difference in acceptability was not statistically significant.

6.8. Experiment 8: Speeded Sentence Completion Task

This experiment tests online performance (i.e. automatic first pass) under stressed conditions by speeding up a Sentence Completion Task in such a way that the participants can no longer carefully monitor their language production. The specific purpose here is to test online *instant* access to knowledge of lexico-syntactic constraints on V2 word order after preposed adverbials of manner. The participants in this experiment are the same as in experiment 7, thereby making a cross-comparison between language comprehension and production possible. From this comparison conclusions on near-native competence and performance under limited cognitive resources can be made. The prediction here is that because of the significant time constraints Dutch L2 learners of English produce more errors with respect to word order after preposed adverbials of manner than native speakers of English.

6.8.1. Method

Participants

The same participants from experiment 7 were tested in this experiment (repeated below):

i. An experimental group of 18 Dutch learners of English (age range: 18-32, mean age: 21.5, L2 onset age range: 7-13, mean L2 onset: 10.6; see Appendix J for individual data).[27] The participants were BA students of English Language and Linguistics at Radboud University Nijmegen and were selected by lecturers who diagnosed them to pass for C1 proficiency level (CEFR) in their second language.

ii. A control group of 22 native speakers of English (age range: 20-46, mean age: 27.1; see Appendix J for individual data). These participants were recruited among the students of Edinburgh University, who had not participated in any of the previous experiments reported in this thesis (apart from experiment 7).

Materials

There were seventy-two items in this task, of which forty were filler items and thirty-two experimental items. It was made sure that there were as many grammatical items as there were ungrammatical ones. The experimental conditions consisted of incomplete utterances containing either an adverbial with a negative polarity item or one with a positive polarity item (so there were sixteen items per experimental condition). For example, incomplete utterances would start with 'Under no condition …' or with 'In certain circumstances …' This means that only Polarity was a factor in this experimental design as participants had to produce the word order themselves. In order to prevent primed sentence productions the verbs presented prior to the incomplete utterances were different from the ones the participants saw in the speeded Grammaticality Judgement Task (see procedure section below).

As with the previous experiments, all of the experimental items were controlled for the number of words (word count) and number of characters (sentence length). Post-hoc Bonferroni corrected *t*-tests revealed no significant differences in word count (all p values > 0.90) and sentence length (all p values ≥ 0.03; Bonferroni corrected critical p value is 0.0125) between the different conditions. See Appendix G for full details of these statistics.

[27] The same participants from experiment 7 participated in this experiment. So among the L2 participants, there were no main effects of early L2 onset age (p=0.553), having non-native Dutch parents (p=0.337), having stayed in an English-speaking community for more than 6 months (p=0.846) or 3 years (p=N/A) on L2 proficiency.

Procedure

The speeded Sentence Completion Task was programmed in E-prime 2.0 and was administered either directly before or directly after the speeded Grammaticality Judgement Task. In the speeded Sentence Completion Task a conjugated finite verb appeared on screen for half a second after which an incomplete utterance appeared for another half a second, the participant was asked to complete this utterance using the conjugated verb he or she saw prior to the incomplete utterance. For example, the verb 'threatened' flashed up on screen followed by the incomplete utterance 'On several occasions …' The use of a non-finite verb ensures that the participant would not simply add an infinitive after the preposed adverbial to construct an imperative as in *e.g.* 'On several occasions threaten', but had to incorporate a subject into the sentence, *e.g.* 'On several occasions he threatened her.'

Several pilot trials were conducted to find out that the ideal timing for a single three-phase experimental trial was: half a second of a blank screen, followed by half a second of showing the verb on screen, followed by presenting the incomplete utterance for four seconds. To put the participants under even more stress the four second time frame was visualised by a countdown clock. This ensured that a) participants were under considerable time pressure, and b) participants were aware of how much time they had left to produce an utterance. The heightened anxiety and time stress to try to fulfil the task contributed to unmonitored speech production as can naturally be found in *e.g.* a heated conversation between two people.[28] Any speech produced outside this four second time window was not recorded by E-Prime. The font used to show the verb and incomplete utterance was Courier New size 20.

The experimental and filler items were presented in a pseudo-randomised order in four blocks of eighteen items. Each block consisted of ten fillers and eight experimental items, of which four contained positive preposed adverbials of manner and four contained negative preposed adverbials of manner (see Appendix G for the experimental items).

6.8.2. Results

Four participants (three L2ers, one L1er) whose 'other production' responses were over 20%, meaning they produced no response or sentences that started with a different utterance than instructed, were excluded from the analyses. Table 36 below provides an overview of the participants' mean percentage of (un)grammatical V2/V3 or other productions in the speeded Sentence Completion Task.

[28] As far as spontaneous speech production goes when participants are steered into a direction by having to complete an incomplete sentence. In this instance, unmonitored means that the interlocutor does not overly apply prescriptive grammar but reacts in a first pass to the incomplete utterances.

Table 36. Percentages of specific V2/V3 structures or other structures produced

	NegXVS	**NegXSV*	**PosXVS*	*PosXSV*	*Other*
Dutch L2ers	37.29%	10.00%	11.67%	35.42%	5.63%
English L1ers	44.79%	1.34%	6.10%	41.52%	6.25%

Table 36 reveals a higher incidence of ungrammatical V2 (*PosXVS) and V3 (*NegXSV) structures produced among the Dutch L2ers compared to the English L1ers, whereas the 'other' responses were more or less similar between the two groups.

A Logistic Mixed Effect Regression analysis in which the dependent variable is a binary variable Grammatical Word Order, the fixed factors Polarity and Group, and the random factors Participant (divided in subgroups) and Item, yields the following LMER model and results (see Table 37):

```
fit <- lmer(Grammatical Word Order ~ Polarity * Group + (1|Group/Participant) + (1|Item), data = d, family="binomial")
```

Table 37. LMER analysis of the fitted model

	Estimate	***Std. Error***	***z value***	***p value***
(Intercept)	1.2128	0.2598	4.668	< 0.001
Polarity	-0.1984	0.3034	-0.654	0.513
Group	1.1870	0.3066	3.871	< 0.001
Polarity*Group	-0.3903	0.3212	-1.215	0.224

The AIC, BIC, logLike values were 1066, 1102, -526.1 respectively.

A significant main effect of Group ($p<0.001$) confirmed a difference in language production between near-native Dutch learners of English and native speakers of English, though the LMER analysis cannot single out this difference as a result of Polarity in the incomplete utterances as there was no main effect of Polarity, nor an interaction between Polarity and Group.

However, separate *t*-tests performed on the different structures produced in the speeded Sentence Completion Task revealed there was a significant difference (Bonferroni corrected to a critical p value of 0.0125) in the number of *NegXSV productions between Dutch L2ers and English L1ers, where the L2ers produced the ungrammatical V3 structure significantly more: $t(35)=3.49$ ($p=0.001$). There was no significant difference between Dutch L2ers and English L1ers with respect to the other ungrammatical, *PosXVS, structure: $t(35)=1.72$ ($p=0.095$), though in general Dutch L2ers did produce more ungrammatical V2

than the English L1ers, see Figure 25 below (where 0 means ungrammatical and 1 means grammatical).

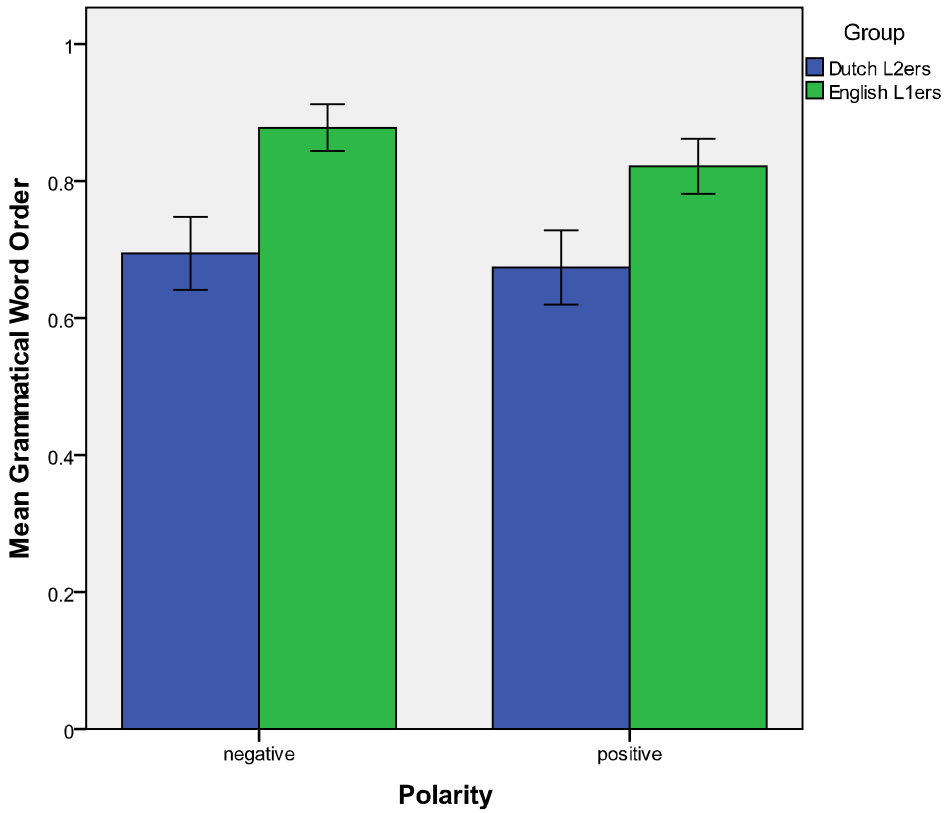


Figure 25. Grammatical structures according to conditions (error bars: 95% CI)

6.8.3 Discussion

The results show that ungrammatical V3 word order after preposed adverbials of manner containing a negative polarity item (*NegXSV) was significantly more produced by highly advanced to near-native Dutch learners of English than it was by native speakers of English. As mentioned in the discussion of experiment 7, this non-native-like production by the Dutch learners of English could have been a direct consequence of limited cognitive resources (*i.e.* reduced access to working memory) induced by the time pressure component of the speeded Sentence Completion Task. So the results of this experiment confirmed that the Dutch learners of English behaved similarly in their L2 production with respect to word order acceptability as they did in their L2 comprehension (experiment 7), *i.e.* overextending V3 word order after preposed adverbials of manner containing a negative polarity item.

6.8.4. Conclusion

In contrast to the general predictions set out at the start of this thesis (see Chapter 2), highly advanced to near-native Dutch L2 learners of English were less subject to V2 word order transfer after preposed adverbials of manner than expected from a theoretical point of view. The results of the last experiments confirmed that L1 V2 word order was not seeping through into the L2 grammar of the highly advanced to near-native Dutch learners of English at the syntax-lexicon interface. In fact, it was sufficiently inhibited, even so much so that other issues arose. Instead of exceptional V2 in English being condoned on erroneous grounds (via L1 transfer), this particular instance of residual V2 word order was actually less accepted and produced. The Dutch learners of English overextended learned knowledge on English word order, and thereby produced V3 word order in those circumstances where V2 was licensed. The explanation for this behaviour is that the lack of cognitive resources available (due to the time constraints imposed by the speeded task and memory constraints imposed by limited working memory capacity as a result of L2 processing) forces the Dutch L2 learners of English to adopt a more cost-efficient linear processing strategy. A strategy in which canonical English word order (SVO) is appended after preposed adverbials of manner despite the presence of negative polarity items (*NegXSV). So the prediction regarding more errors in word order after preposed adverbials of manner among the Dutch L2ers compared to the English L1ers were borne out in this experiment with respect to ungrammatical V3.

The results in this production experiment agree with the comprehension results elicited in the speeded Grammaticality Judgement Task in experiment 7. This was anticipated as the same participants were tested in both tasks. A more detailed analysis of the differences and similarities between comprehension and production, and the different methodologies adopted to test these, is discussed extensively in the next section.

6.9. Comparisons between experiments on production (experiments 4-8)

The first production experiment involving preposed adverbials of manner (experiment 4) revealed that very advanced to near-native Dutch learners of English produced significantly more ungrammatical V3 (*NegXSV) and ungrammatical V2 (*PosXVS) structures than native speakers of English. The statistical analyses confirmed that Polarity and Verb Order (Word Order) were fair predictors for priming/producing the following structures starting with preposed adverbials of manner: NegXVS, *NegXSV, *PosXVS, PosXSV.

In order to replicate these results a similar Syntactic Priming Task with more experimental items was adopted (experiment 5). This experiment also revealed that Dutch L2ers produced significantly more ungrammatical V3 (*NegXSV) structures than English

L1ers. However, English L1ers produced significantly more ungrammatical V2 (*PosXVS) structures than Dutch L2ers in this experiment (the exact opposite as in experiment 4). The only difference between experiments 4 and 5 was the number of stimuli and L2 proficiency among the Dutch L2ers (experiment 4 targeted near-natives and experiment 5 highly advanced learners). Therefore, the difference in priming of ungrammatical V2 should be attributed to the difference between participants. To rule this extralinguistic factor out as a confounding factor, we adopted a within-subjects experimental design testing for both comprehension and production (experiments 7 and 8).

In order to investigate whether, and if so how, different experimental conditions would impact language production among the different language groups a sixth experiment was adopted. This experiment was a replication of experiment 5 with the exact same materials but with an added Digit Recall Task that would tax the memory resources of the participants. The results of this experiment revealed once again that Dutch L2ers produced significantly more ungrammatical V3 (*NegXSV) structures than English L1ers, but found no evidence for a significant difference in ungrammatical V2 (*PosXVS) production between the two language groups (as opposed to experiments 4 and 5). From this we can conclude that L1 transfer of V2 word order was not facilitated by limited memory resources in the L2 production of very advanced Dutch learners of English.

To examine whether limiting other resources has an effect on L2 production, we adopted a speeded Sentence Completion Task in which not working memory but participants' reaction times were constrained. This experiment, experiment 8, revealed that Dutch L2ers produced significantly more ungrammatical V3 (*NegXSV) structures than English L1ers and roughly the same number of ungrammatical V2 (*PosXVS) structures as English L1ers.

So in experiments 6 and 8 different constraints were imposed on the participants' resources: in experiment 6 participants' memory resources were constrained as a result of a Digit Recall Task, and in experiment 8 participants' reaction time was constrained by means of a speeded Sentence Completion Task, but the results in both experiments were exactly the same. From this we can conclude that not only limiting Dutch L2ers' memory resources, but also their time resources, led to over-applying learned L2 knowledge about word order in English, and not to L1 transfer of Dutch word order.

As a result of having the same participants participate in experiments 7 and 8 we can now perform a within-subjects comparison of language comprehension (experiment 7) versus language production (experiment 8). Experiment 7, a speeded Grammaticality Judgement Task, revealed that Dutch L2ers judged ungrammatical V3 (*NegXSV) structures

grammatical on significantly more occasions than English L1ers when the participants in both groups had to make these judgements under substantial time pressure. The experiment also revealed that ungrammatical V2 (*PosXVS) structures in this experiment were judged similarly by the Dutch L2ers and English L1ers, *i.e.* judged grammatical/ungrammatical more or less on the same number of occasions. Overall, the results of the language comprehension task coincided with the results of the language production tasks in experiments 5, 6 and 8. This means that the register did not have an effect on how grammatical representations were conveyed among very advanced to near-native Dutch learners of English.

In sum, the outcome of all production experiments is that significantly more ungrammatical V3 (*NegXSV) structures were produced among Dutch L2ers than the English L1ers, but no conclusive statements could be made with respect to ungrammatical V2 (*PosXVS) between the different language groups as the differences in ungrammatical V2 production varied between experiments.

6.10. Chapter summary

This chapter reported experimental data testing for interface phenomena at the syntax-lexicon interface regarding V2 word order after preposed adverbials of manner. The data was elicited through means of four different online tasks, where extra workload was added to the last three experiments by applying memory/time constraints. The data presented here revealed that highly advanced to near-native Dutch learners of English did not suffer from L1 transfer in these tasks, but rather over-applied their L2 knowledge on word order. So rather than L1 seeping through in L2 comprehension and production, highly proficient L2 learners fall back to default prescriptive rules they know the L2 adheres to, thereby disregarding certain exceptions in interface structures. This implies that near-nativeness does not differ from nativeness with respect to differences in underlying grammatical representations; rather it is real-time access and integration of grammatical knowledge that separates the two. The next chapter discusses this in more detail along with the implications for the bilingual production model, and the overall big picture on near-native research.

Chapter 7 Conclusion

7.1. Chapter overview

The previous Chapters 4-6 presented empirical data obtained in linguistic experiments via different methodologies (discussed in Chapter 3) in order to answer the research questions raised in Chapter 2 that contribute to research on near-nativeness at the syntax-lexicon interface. This chapter summarises the overall set of results and then discusses these in more detail per linguistic structure tested. The empirical patterns found in this study lead us to draw conclusions on late L2 learners' comprehension and production with respect to competence and performance (as compared to native speakers). The general and specific research questions posed at the start of this thesis are answered explicitly and the implications of these answers are discussed in light of current Second Language Acquisition theories and models. The chapter finishes with recommendations for further research on the syntax-lexicon interface and on near-native research in general.

7.2. Overall results

The general rationale for the research conducted in this thesis was to investigate whether late L2 learners can ever achieve native-like proficiency. To limit the scope of the vast implications of this question, we decided to focus on lexical-semantic word order dependence in L1 and L2 English, *i.e.* word order that is dependent on specific lexical items at the syntax-lexicon interface. We adopted several offline and online methodologies to investigate competence, performance, and processing.

Magnitude Estimation Tasks were adopted as an offline task to measure L2 knowledge (competence) among highly advanced to near-native late Dutch L2 learners of English, and how these late L2 learners compare to native speakers of English with respect to specific linguistic knowledge on English at the syntax-lexicon interface. As the participants had sufficient time and memory resources in this task to carefully monitor their judgements on English sentences, this task first and foremost tested comprehension (not production) and offline processing. In order to test for effects associated with performance and online processing, we adopted a Syntactic Priming Task, where the time window in the task would reduce how much monitoring in language production participants could engage in. In addition, we also investigated how processing load affects language comprehension and production among L1 and advanced/near-native late L2 speakers of English. The measures we took to increase processing load consisted of reducing the time window in which the participant had to respond and introducing an additional task they had to perform

simultaneously to the Syntactic Priming Task. The aim was to overload the participants' working memory in such a way that they could no longer carefully monitor their language comprehension and production.

The specific linguistic structures testing for interface phenomena at the syntax-lexicon interface were: possessive structures, locative inversions and preposed adverbials of manner. Comprehension and knowledge of lexico-syntactic constraints of these structures were tested in English among advanced/near-native Dutch learners of English and native speakers of English, and in Dutch among native speakers of Dutch only. Production and online processing of these structures were tested only in English among the Dutch L2ers and English L1ers.

The general pattern that emerged was that Dutch L2ers were as much aware of the lexico-syntactic constraints and exceptions of these particular structures at the syntax-lexicon interface in English as native speakers of English were, though their online performance differed from native speakers of English, especially when they were placed under extra processing load.

The overall similarities found between the advanced and near-native L2 learners and the native speakers indicated that the participants in these groups did not differ from one another in their comprehension (acceptability judgements) and production (priming susceptibility) of locative inversions with unergative or unaccusative verbs. However, the experiments also revealed that there were differences between the different language groups with respect to acceptability judgements of word order in possessive structures, and that the most significant differences between the different language groups were found in comprehension and production of word order after preposed adverbials of manner.

So highly advanced/near-native Dutch L2 speakers of English showed native-like behaviour with respect to lexical-semantic constraints of transitivity on word order in comprehension and production, but they showed non-native-like behaviour with respect to lexical-semantic constraints of polarity and animacy lexical items impose on word order. In sum, two out of three of the tested syntax-lexicon interface structures revealed non-native-like divergence in comprehension and/or production. We will discuss these differences in more detail below.

7.3. On possessives

In Chapter 4 we saw that in the offline Magnitude Estimation Tasks (testing for language comprehension) ungrammatical postnominal genitive constructions received higher acceptability ratings from Dutch learners of English than from native speakers of English.

This was explained as an L1 transfer effect as postnominal genitives are more frequent in Dutch (even if these structures contain animate possessors and possessums). On the other hand, there were no significant differences in ratings between Dutch learners of English and native speakers of English with respect to prenominal genitives.

The results also showed that in online Syntactic Priming Tasks (testing for language production) both Dutch L2ers and English L1ers could be primed into producing ungrammatical postnominal genitives. We interpreted this as a priming effect and not as an L1 effect, because some of the specific ungrammatical postnominal genitives primed were ungrammatical in Dutch too. Furthermore, English L1ers were primed into producing ungrammatical postnominal genitive structures on even more occasions than the Dutch learners of English (due to a 'saliency' effect). In sum, with respect to postnominal genitive structures we can conclude that there is an L1 transfer effect in offline comprehension but not in online production among the Dutch learners of English.

7.4. On V2 structures

Locative inversions

In the Magnitude Estimation Tasks (testing for offline comprehension) in Chapter 5, we saw that the locative inversions under different conditions (unaccusatives in light contexts vs unaccusatives in heavy contexts and unergatives in light contexts vs unergatives in heavy contexts) were rated similarly by Dutch L2 learners of English and native speakers of English, although there was a clear trend for unaccusatives in heavy contexts to be more accepted in locative inversions by the Dutch learners of English than by the English native speakers.

In the Syntactic Priming Tasks (testing for online production) the Dutch L2 learners of English and the native speakers of English could both be primed into producing locative inversions. More specifically, both groups were more primed into producing locative inversions containing unaccusative verbs than locative inversions with unergative verbs (the exact opposite of the ratings given in the offline Magnitude Estimation Task to these structures). In addition, native speakers of English were producing more locative inversions in general than the Dutch learners of English (this is also the exact opposite of the findings in the offline Magnitude Estimation Task).

So with respect to locative inversion structures, the data elicited through the Magnitude Estimation Tasks and Syntactic Priming Tasks did not show a consistent pattern and as a result made it impossible to draw any conclusions on L1 or L2 knowledge interference at the syntax-lexicon interface. Therefore a different interface structure in which

sentence word order is dependent on the presence and characteristics of lexical items in preposed adverbials was tested, *viz.* sentences with a preposed adverbial of manner.

Preposed adverbials of manner

In the offline Magnitude Estimation Task (experiment 2), the preposed adverbials of manner with positive polarity items followed by an ungrammatical postverbal subject (V2 word order) were rated significantly higher by the Dutch learners of English than by the native speakers of English. This was explained as an L1 effect, as V2 word order in these circumstances is the default in Dutch. When participants were asked to provide magnitude estimation values to preposed adverbials of manner with positive polarity items followed by grammatical preverbal subjects (V3 word order), the Dutch L2ers and English L1ers assigned similar ratings to these. The same was true for preposed adverbials of manner with negative polarity items followed by grammatical postverbal subjects (V2 word order), and for ungrammatical preverbal subjects (V3 word order) among the Dutch learners of English and native speakers of English.

In the online Syntactic Priming Task (experiment 4), the Dutch learners of English were primed into producing ungrammatical V2 after preposed adverbials of manner containing a positive polarity item on more occasions than the native speakers of English. We interpreted this as an L1 transfer effect (as with the results on language comprehension above). In addition, the Dutch L2 learners of English were also primed into producing more ungrammatical V3 after preposed adverbials containing a negative preposed adverbial of manner than the English native speaker. We interpreted this as overextending L2 knowledge (hypercorrection).

In the second Syntactic Priming Task (experiment 5) the Dutch learners of English produced significantly more ungrammatical V3 word order after negative preposed adverbials of manner than the English native speakers. In contrast, the English native speakers produced significantly more ungrammatical V2 after positive preposed adverbials of manner than the Dutch learners of English. However, both findings are not the result of priming as the groups produced these ungrammatical structures as many times after a prime sentence as they did after a non-prime sentence.

In order to test whether unmonitored comprehension and production would lead to different results among Dutch L2 learners of English, participants were again tested on language comprehension and production but with additional time and memory stress. This was done in order to prevent careful monitoring and carefully applying and overextending

L2 knowledge in the case of Dutch learners of English: so different results could be expected in those experiments than the ones summarised above.

Preposed adverbials of manner under limited cognitive resources

In the online Syntactic Priming Task with additional Digit Recall Task (experiment 6), the Dutch learners of English produced significantly more ungrammatical V3 word order after negative preposed adverbials of manner than English native speakers (this is the same result as in the other Syntactic Priming Tasks without digit recall; experiments 4 and 5). In addition, the Dutch learners of English were primed significantly more into producing ungrammatical V2 word order after positive preposed adverbials of manner than the native speakers of English (this matches with the ratings in the offline Magnitude Estimation Task).

In the online speeded Grammaticality Judgement Task (experiment 7), the Dutch L2 learners of English accepted ungrammatical V3 word order after negative preposed adverbials of manner significantly more than native speakers of English (this is the same result as in the offline Magnitude Estimation Task in experiment 3 and matches with the results of the online Syntactic Priming Tasks in experiments 4-6). The Dutch L2 learners of English also accepted ungrammatical V2 word order after preposed positive adverbials of manner on more occasions than the English native speakers; although this difference was considerable, it was not significant (it was only significant in the offline Magnitude Estimation Task in experiment 3).

In the online speeded Sentence Completion Task (experiment 8), the Dutch L2 learners produced significantly more ungrammatical V3 word order after negative preposed adverbials of manner than the native speakers of English (this is the same result as in all online production tasks and agrees with the ratings in the offline Magnitude Estimation Task). However, the Dutch L2 learners of English produced as much ungrammatical V2 after positive preposed adverbials of manner than English native speakers.

In sum, there was no overall L1 effect of V2 word order in all of the offline and online comprehension and production tasks combined, though the data showed that overextension of L2 word order knowledge occurred in all of the offline and online comprehension and production tasks by advanced to near-native Dutch learners of English.

7.5. Answers to the research questions

At the start of the empirical research undertaken for this study, we postulated several general research questions, followed by more specific research questions on the particular linguistic structures tested. These questions are reiterated and answered explicitly one by one below, so it is easier for the reader to process the answers to the research questions.

General research questions

Question 1: What is the exact difference between near-nativeness and nativeness?

Answer: The results in this study showed that most of the times the native speakers of English possessed the ability to instantly access and correctly apply implicit linguistic knowledge in order to produce grammatical linguistic structures under stressed conditions at the syntax-lexicon interface. Under the same stressed conditions Dutch advanced and near-native speakers of English produced significantly more non-native-like linguistic structures at the syntax-lexicon interface than the native speakers of English. From this we can conclude that interface phenomena occur under these so-called 'stressed' conditions (note that this was not pushing it to the limits) because the L2 learners are less able to instantly access and correctly apply implicit and explicit linguistic knowledge. The explanation we proposed for this is that L2 learners have a momentarily decrease in working memory capacity as a result of the induced stressed conditions (time/memory constraints). On top of that, the L2 learner's working memory also has to deal with their dormant language in addition to their active language, resulting in a further reduction of working memory capacity and subsequently interfering with the monitoring aspect of the active language.

Question 2: Are there any (lexico-)syntactic structures in the L2 end state of highly advanced to near-native learners that are divergent from the L1 grammar, *i.e.* evidence for underspecification of knowledge representations?

Answer: There are structural differences in the lexico-syntactic representation of the L2 grammar of highly advanced to near-native Dutch learners of English compared to native speakers of English with respect to word order in possessive constructions with animate possessors and possessums, and word order after preposed adverbials of manner. The answer to this question comes from the differences in ratings of these structures in the offline and online comprehension tasks, where Dutch learners of English rated the particular ungrammatical structures higher, *i.e.* in a non-native-like fashion, and from the differences in susceptibility to ungrammatical V3 word order priming after preposed adverbials of manner containing negative polarity items.

Question 3: Are there significant differences in the ability to integrate information of the lexicon and syntax in real-time between highly advanced to near-native L2 and L1 speakers, *i.e.* evidence for a divergent processing strategy or a processing deficiency?

Answer: There are no signs of a processing deficiency (i.e. no underspecification) at the syntax-lexicon interface of highly advanced/near-native Dutch learners of English with respect to possessive structures, as the online results in the Syntactic Priming Task were similar in every aspect to those of the English native speakers. As for V2 structures, the data showed there were no problems in processing locative inversions, though irregularities arose when Dutch L2ers were confronted with ungrammatical word order after preposed adverbials of manner. When presented with ungrammatical V3 word order after negative preposed adverbials of manner, Dutch L2ers could be primed into producing this structure (instead of adopting grammatical V2). So the experimental data showed near-native Dutch L2ers adopted a divergent processing strategy from the English L1ers: instead of hierarchically building a tree structure where the verb order is determined by the lexico-syntactic features of other elements in the sentence (polarity items in preposed adverbials of manner), the Dutch L2ers simply adopted a linear/flat approach where canonical SVO (V3) word order was over-applied irrespective of the lexico-syntactic features of other elements in the sentence. To investigate this issue more thoroughly, and detect possible similarities in processing strategies among L1ers when placed under extra stress, follow-up experiments were conducted in which the participants were placed under time and/or memory constraints (see answerts to questions 4, 5 & 6).

Question 4: Are there significant differences in real-time access to cognitive resources dealing with specific (lexico-)syntactic structures between highly advanced to near-native L2 and L1 speakers, *i.e.* evidence for reduced or no accessibility to cognitive resources?

Answer: When put under significant time/memory stress Dutch L2 learners of English produced significantly more ungrammatical sentences with preposed adverbials of manner with negative polarity items and ungrammatical V3 word order than English native speakers. So the effect of restricted access to cognitive resources had a much more significant effect on ungrammatical language production among Dutch L2 learners of English than it had among native speakers of English. This can be interpreted as time/memory constraints of unmonitored online production affecting access to linguistic knowledge much more among L2ers than L1ers. So time/memory constraints placed on the native speakers did not contribute as much to inaccessibility of linguistic knowledge/cognitive resources, whereas it did for near-native speakers. An explanation for this is that time/memory stress affected executive function resources among highly advanced to near-native L2 learners, *i.e.* the

induced stress of time and/or memory constraints led to an inconsistent ability to integrate different types of information, and thus reverting to a 'Good Enough' (i.e. linear) processing strategy.

Question 5: In terms of online priming, can highly advanced to near-native Dutch learners of English be primed into producing ungrammatical English structures?
Answer: Yes, the syntactic priming data revealed Dutch learners of English could be primed into producing:

a) ungrammatical postnominal genitive constructions with animate possessors and possessums,
b) ungrammatical locative inversions with unergatives,
c) ungrammatical V2 word order after preposed adverbials of manner containing a positive polarity item,
d) ungrammatical V3 word order after preposed adverbials of manner containing a negative polarity item.

It should be noted that not all these ungrammatical linguistic constructions were consistently replicated in successive experiments, but that Dutch learners of English foremost 'overextended' V3 word order after preposed adverbials of manner containing negative polarity items in all successive experiments even when they were not primed with this ungrammatical structure.

Question 6: Can native speakers of English be primed into producing ungrammatical English structures to the same extent as the Dutch learners of English?
Answer: Yes, the data elicited in the Syntactic Priming Task of postnominal genitive structures with animate possessors and possessums showed that English native speakers produced this ungrammatical structure when primed. In addition, the priming of locative inversions with unaccusatives amongst English native speakers also confirmed that native speakers can be primed into producing marked linguistic structures. However, the native speakers of English were primed to a lesser extent in producing ungrammatical word order after preposed adverbials of manner. Only after administering significant time and memory stress in the online production tasks (experiments 6-8) were native speakers of English producing more ungrammatical utterances with respect to residual V2 structures than in the unstressed online production tasks, but still not to the same extent as the near-native Dutch L2ers of English. This means that the English L1 production system is more robust against

stress, i.e. not reverting to linear processing strategies as quickly as near-native speakers in their L2 production system. An explanation for this is the reduced working memory capacity among the L2 learners, where having a dormant language (L1) already takes up some of the working memory available. Subsequently, executive function (inhibiting L1 from interfering with L2 and vice versa) and processing strategies are affected (see answer to question 4). In sum, the English L1ers' grammar is unaffected at the syntax-lexicon interface, but can be primed into producing ungrammatical structures (to a certain extent) as a result of extra induced processing stress.

Specific research questions

Question 1: Do highly advanced/near-native Dutch learners of English possess (meta)linguistic knowledge of all lexical-semantic constraints and their exceptions with respect to *possessive structures* in (offline) L2 *comprehension, i.e.* when they have sufficient time to monitor and check explicit L2 knowledge?

Answer: A Magnitude Estimation Task revealed that in most contexts there were no significant differences between highly advanced Dutch learners of English's and native speakers of English's ratings regarding preferences of prenominal genitive structures. However, the Dutch learners did accept ungrammatical English postnominal genitives with animate possessors more than the English native speakers, even though low ratings indicated their disapproval of this marked structure in English. Despite this disapproval, Dutch L2 learners still gave it significantly higher ratings than the English native speakers. A possible explanation could be L1 transfer as postnominal genitives with animate possessors are grammatical in Dutch.

In order to test whether L1 transfer indeed influenced the Dutch L2 learners to accept postnominal genitives with animate possessors more, a Syntactic Priming Task was devised where Dutch L2 learners and native speakers of English were primed with these structures and their subsequent language productions recorded. If these marked postnominal structures were indeed more often primed among the Dutch L2ers than amongst the English L1ers, then this would be a clear indication that Dutch L1 grammar is influencing English L2 grammar at a representational level (see answer to question 2 below).

Question 2: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-semantic constraints and their exceptions with respect to *possessive structures* in (online) L2 *production*, *i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge?

Answer: The results of a Syntactic Priming Task showed that highly advanced and near-native Dutch L2ers of English can indeed be primed into producing ungrammatical postnominal genitive constructions with animate possessors and possessums. However, the data also revealed that native speakers of English produced even more of these ungrammatical genitive constructions upon priming. In sum, the data elicited in this task could not singularly point out that L1 transfer is at the root of Dutch L2ers' acceptance of postnominal genitives with animate possessors.

To find out whether there really still is L1 transfer in highly advanced to near-native Dutch learners of English' comprehension and production, a different linguistic structure was pursued. In order to test the interface hypothesis, the structure investigated, like the possessive structure, is one dependent on a cross-section between two domains, *i.e.* the lexicon and syntax, and shows some degree of optionality in English. The ideal candidate for this was V2 word order structures as they are only possible under certain constraints in English, but are the default in Dutch (see answers to questions 3-5 below).

Question 3: Do highly advanced/near-native Dutch learners of English possess (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures in (offline) L2 *comprehension*, *i.e.* when they have sufficient time to monitor and check explicit L2 knowledge?

Answer: A Magnitude Estimation Task, where the critical items contained V2/V3 word order after preposed adverbials of location and manner, was adopted to investigate if highly advanced and near-native Dutch learners of English were aware under which circumstances V2 structures are grammatical in English. The results revealed that Dutch learners of English mirror English native speaker's preference for unaccusatives over unergatives inside locative inversions and acceptance of residual V2 word order after preposed adverbials containing a *negative* polarity item. However, Dutch learners of English accepted ungrammatical V2 word order after preposed adverbials containing a *positive* polarity item significantly more than the English native speakers. This indicates that even near-native Dutch learners of English were still sensitive to V2 transfer from the L1 at the syntax-lexicon interface *in (offline) comprehension*.

In order to test whether L2 learners' representation of V2 structures in English suffers from L1 transfer, a Syntactic Priming Task was conducted. If the marked V2 structures were significantly more primed among the Dutch L2ers than the English L1ers, this would be a clear indication that Dutch L1 grammar is not efficiently suppressed by the L2 learners and subsequently influences English L2 grammar at a representational level.

Question 4: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures in (online) L2 *production, i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge?

Answer: A Syntactic Priming Task revealed that there was no significant difference in the number of locative inversions primed between highly advanced/near-native Dutch learners of English and native speakers of English. However, the Dutch L2ers produced significantly more ungrammatical V2 structures after preposed adverbials of manner containing a positive polarity item than the native speakers of English. A follow-up Syntactic Priming Task focusing only on preposed adverbials of manner revealed that Dutch L2ers also produced significantly more ungrammatical V3 structures after preposed adverbials containing a negative polarity item than native speakers of English.

From these findings we concluded that highly advanced to even near-native Dutch learners of English's grammar differs from native speakers of English's in that they have not internalised the lexical dependency of polarity items on word order in real-time L2 production (ungrammatical V2 after positive preposed adverbials), and are even prone to 'hypercorrecting' English residual V2 to V3 (ungrammatical V3 after negative preposed adverbials). In order to investigate whether real-time access and application of (meta)linguistic L2 knowledge facilitates hypercorrection, another Syntactic Priming Task was devised in such a way that access to (meta)linguistic knowledge was blocked by overloading processing resources (see answer to question 5 below).

Question 5: Do highly advanced/near-native Dutch learners of English have real-time access to (meta)linguistic knowledge of all lexical-syntactic constraints and their exceptions with respect to V2 structures after *preposed adverbials of manner* in (online) L2 *production under extra stressed conditions, i.e.* when they do not have sufficient time to monitor and check explicit L2 knowledge and on top of that have most –if not all– of their memory resources taken up by an additional task?

Answer: A Syntactic Priming Task with an added Digit Recall Task to take up most or all of the participant's memory resources was administered so that real-time access to (meta)linguistic knowledge was severely hindered, if not blocked at all. Upon memory overload, native speakers of English produced more ungrammatical V3 word order after negative preposed adverbials of manner in total than when they were not overloaded (experiment 5). This indicates that non-target-like production could be a result of a processing deficiency. The Dutch L2 production of ungrammatical V3 word order after negative preposed adverbials of manner, regardless of the prime and whether memory resources were overloaded or not, remained high, indicating overextension of English canonical SVO word order. In addition, Dutch L2ers were primed into producing more ungrammatical V2 after preposed adverbials containing positive polarity items in the Syntactic Priming Task with digit recall than in the one without the extra Digit Recall Task. This outcome indicated that V2 transfer may occur under stressed induced conditions.

A speeded Grammaticality Judgement Task was administered to confirm whether there are structural syntactic differences in representation in online comprehension under time pressure between Dutch learners of English and native speakers of English. Under considerable time constraints, Dutch learners of English accepted ungrammatical V2 word order after positive preposed adverbials of manner more than English native speakers, though not significantly more, so this does not confirm a structural difference in representation. However, Dutch L2 learners of English did accept ungrammatical V3 word order after negative preposed adverbials of manner significantly more than native speakers of English, as was the case in the previous online production experiments. This result does confirm a syntactic processing anomaly at the syntax-lexicon interface in online comprehension under stressed conditions.

In order to confirm whether there was also a difference in syntactic representation between Dutch learners of English and native speakers of English with respect to word order after preposed adverbials of manner in online production under extra time stress, a speeded Sentence Completion Task was adopted. The results revealed no significant difference in the production of ungrammatical V2 after positive preposed adverbials of manner between Dutch L2 learners and native speakers of English (so no V2 transfer under time pressure).

However, the same result was obtained with respect to V3 word order in the online comprehension task under time stress as in the other online Syntactic Priming Tasks. Dutch L2 learners of English produced significantly more ungrammatical V3 word order after negative preposed adverbials of manner than English native speakers. This overextension of V3 word order where V2 is licensed confirms that –when pressurised– Dutch L2ers

experience inefficient information integration between the lexicon and syntax, and subsequently fall back on default English word order.

7.6. Implications

The results of this study allow us to progress in our understanding of Second Language Acquisition in three ways. First, we can address our general question whether late second language learners can ever attain native-like proficiency. Second, we can use this data to refine theories on Second Language Acquisition. Thirdly, the refinements can be captured in a processing model.

The data elicited in experiments 1 to 8 showed that L2 grammars of highly advanced to near-native Dutch learners of English were neither incomplete nor divergent with respect to possessive structures and word order in preposed adverbials of location and manner at the syntax-lexicon interface. That is, at the L2 end stage when these late Dutch learners of English no longer progress in their acquisition of English, their L2 grammar does not appear to contain incomplete knowledge representations or divergent syntactic patterns compared to the grammar of native speakers of English (i.e. no underspecification).

However, when these Dutch learners of English were put under significant time and memory stress their L2 performance is non-native-like at the syntax-lexicon interface with respect to word order after preposed adverbials of manner. The explanation for this pattern is that Dutch near-native speakers of English do possess the linguistic knowledge of (exceptions of) word order constraints after preposed adverbials of manner and are able to apply these under monitored circumstances, but as soon as they are pressurised they seem not to be able to integrate the information of lexical polarity items in preposed adverbials affecting word order *in a timely manner* with respect to exceptional V2. Instead they fall back to narrow (linear) syntactic rules producing default SVO (V3) word order on significantly more occasions than native speakers of English would do. This is the result of a 'good enough' approach to language processing: as the parser has to economise on processing costs in order to produce a sentence on time, lexical items are stringed together in a linear fashion and as the results show this happens sometimes at the expense of grammaticality.

In other words, applying significant stress (time/memory constraints) leads to less efficient integration of lexical and syntactic information, so that the exceptions at the syntax-lexicon interface are overlooked and standard narrow syntax rules are linearly applied (overextension of L2 knowledge). In sum, when considerable time and memory constraints are applied (in our case through experimental manipulation, but in a day-to-day situation this

could be a heated conversation for example) near-native performance shows inconsistencies with native performance with respect to interface structures.

This means that in order to account for the near-native performance of the participants in this study, the Interface Hypothesis should be altered slightly. The original postulation by Sorace & Filiaci (2006: 340) was that "narrow syntactic properties are completely acquirable in a second language, even though they may exhibit significant developmental delays, whereas interface properties involving syntax and another cognitive domain may not be fully acquirable." The experimental data in our research showed that interface properties concerning syntax and the lexicon are in fact fully acquirable by late L2 learners, though *the integration of knowledge of these domains in real-time* is less efficient under stressed/unmonitored conditions than in native speakers. The reason for this inefficient integration is that L2 learners may have less cognitive resources available to them than native speakers, because L2 processing in itself already takes up more working memory than L1 processing (*e.g.* by having to deal with an extra vocabulary and an extra set of syntactic rules). Though as the results in the later experiments in this study have shown, when native speakers are pushed to their limits by enforcing significant time stress and memory load, they too will fall back to linear processing in order to prevent a breakdown in communication. However, this affects fewer native speakers and to a lesser degree than the near-native speakers in general (depending on individual working memory capacity).

Sorace (2011: 20) confirms that "[o]verall then, there is robust evidence that at least L2 speakers are less efficient than monolinguals at integrating information from different domains in real-time language use." However, it is not mentioned what exactly 'less efficient' entails. Does it mean that residual optionality in L2 performance is the result of L1 effects seeping through at specific interfaces by falling back on L1 syntax due to insufficient processing resources, or that it is a result of reduced working memory capacities because the second language learner is not monitoring one but two languages at the same time? Sorace (2011) poses the same question in a slightly different way: is it a problem due to L1 transfer or due to the fact the L2 speaker has to control two languages in real time? If the latter, we can see in some cases not so much transfer from the other language but rather the resort to a default form or linear processing strategy. In this study, we have seen that processing inefficiency is not a result of L1 effects *per se*, but a result of L2 effects, *viz.* overextension of narrow L2 syntax rules (cf. default forms) even in exceptional cases such as interface structures.

Taking de Bot's (1992) bilingual production model into consideration, the overextension of L2 rules can be explained as a linear processing strategy for coping with L2

message generation/language production under stress. As the monitoring device in the conceptualiser is overloaded (see Figure 2, Chapter 2) the message that is generated is passed on to the formulator without careful monitoring. The lexical items and syntactic rules are integrated in the grammatical encoding unit, but the links between the speech-comprehension system and the lexicon and the speech-comprehension system and the conceptualiser are weakened by time and memory constraints (as typically present in real-time conversation). Subsequently exceptional rules to the default L2 grammar rules are overlooked in L2 message formulation, and gives rise to linear strategies where the lexical items are stringed according to canonical (default) forms. This means that both the *microplanning stage* (responsible for selecting information to realise communicative goals) and the *macroplanning stage* (responsible for the retrieval of information) are affected. The former is affected in the conceptualiser due to lack of monitoring, and the latter in the formulator due to weakened links between formulator, lexicon and the speech-comprehension system.

The monolingual native speaker's microplanning and macroplanning stages are not as much affected by time and memory constraints in their language production as in the bilingual's, because their access to cognitive resources (e.g. working memory) is not as much overloaded since they only have to deal with one language rather than two or more languages at the same time (even if these are dormant, they still take up working memory capacity). This means that aspects of executive function (*viz.* inhibitory control) are much more involved in second language processing than in native language processing.

The implication of this is that de Bot's bilingual production model should be extended to include an additional working memory component (incl. executive function). In its current state the model is unable to account for divergent productions as a result of time and memory constraints on the speaker. The role of cognitive resources among near-native L2 learners with respect to L2 competence and performance is a factor that should be investigated in more detail. The latter experiments in this study (experiments 6 to 8) have dealt with this issue and suggest that working memory limitations have significantly more effect on language production among highly advanced/near-native L2 learners than native speakers. The role of executive function in L2 processing and its interaction with working memory should be added to the bilingual language production model (see the next section for more recommendations).

In sum, L1 interference did not turn out to be accountable for non-native-like performance of highly advanced to near-native speakers at the syntax-lexicon interface. The overextension of linguistic L2 knowledge according to a linear processing strategy was

responsible for non-native-like performance when near-native speakers were sufficiently pressurised (*e.g.* through time and memory constraints). A replication of the experiments in this study using the methodologies of Syntactic Priming with digit recall, speeded Grammaticality and Sentence Completion Tasks, could provide more experimental evidence for the role of working memory on the integration of information from cognitive domains and syntax in real-time and how this affects near-nativeness. The section below provides more directions for future research.

7.7. Possible avenues for further research

This study focused on linguistic structures concerning word order in possessive structures and after preposed adverbials in English. However, other interface dependent structures at the syntax-lexicon interface should be tested too in order to have more robust evidence for interface phenomena of near-native L2 learners at this interface. In the sections on locative inversion, we described the lexical-syntactic constraints on word order as a result of the unaccusativity/transitivity of the main verb.

Another syntax-lexicon interface dependency concerning unaccusativity is auxiliary selection ('have' or 'be') dependent on verb transitivity. Sorace (1993, 2000b, 2004b, 2011) has investigated this issue extensively, most notably amongst English near-native learners of Italian and German. Recent research by Bard, Frenck-Mestre & Sorace (2010) and Roehm, Sorace & Bornkessel-Schlesewsky (2012) concerns investigating split intransitivity at the syntax-lexicon interface. A replication of their experiments among highly advanced to near-native Dutch learners of English (or English learners of Dutch) can provide more data for interface phenomena at the syntax-lexicon interface of bilinguals with this particular language pair, and potentially provide more robust evidence for the occurrence of interface phenomena among near-native L2 learners in general.

In addition to the online methodologies adopted for researching language *comprehension*, other methodologies like self-paced reading tasks or eye-tracking experiments can be adopted to determine the *exact* time course of language processing. These methodologies, for example, could measure whether there are significant delays in language processing between near-native learners and native speakers when confronted with certain (un)grammatical or gradient structures at the syntax-lexicon interface. As for online *production* methodologies, combining the syntactic priming format with additional tasks tests working memory capacity in online language production. Using different additional tasks will test the working memory capacity in different ways, *e.g.* for time or memory constraints. In this study we have used a Digit Recall Task and speeded Sentence

Completion Tasks to test the influence of working memory on language production and in particular how it might block (meta)linguistic knowledge of the L2, forcing the language learner to produce unmonitored sentences. A slight variation of testing for interface phenomena might be performing such a task not orally, but in written form (*e.g.* a speeded cloze task).

In sum, there is still much research to be done on near-nativeness with respect to the time course and efficiency of integrating information across cognitive domains (*i.e.* online processing), as it has been shown that near-native late L2 learners of a second language are perfectly capable of acquiring a native-like L2 grammar, but still produce non-native-like interface structures when pressurised through time and/or memory constraints.

We have investigated highly advanced to near-native late L2 learners whose L2 was typologically close to their L1 (English and Dutch respectively). In order to pose broader generalisations on the role of working memory and executive function in L2 language production, one would need to investigate language production and comprehension of highly advanced to near-native L2 learners of a language typologically more distant from their L1, as well as control for working memory capacities among the L1ers and L2ers (e.g. by using digit span tasks to distinguish low-span speakers from high-span speakers).

A line of thought worth pursuing is whether a typologically distant L1 is easier to inhibit in L2 production than a typologically similar L1. In the former case the bilinguals' L1 grammar has less in common with the L2 grammar and less interference might be expected on the basis that executive function prevents the bilingual from mixing up similar rules and lexical items (cognates) seeping through from the L1 into the L2 and vice versa. That is, highly advanced to near-native late L2 learners would have to bother less with having to constantly separate cognates and similar but slightly different grammars between their active and dormant languages and can attribute more of their working memory to focusing on the grammar of the active language instead. In these cases the L2 learners could be expected to fall back more on default L2 rules and knowledge, thereby decreasing chances of L1 interference as a source of non-native-like production and comprehension. Even though in this study the results show that non-native-like production was a consequence of falling back on prescriptive L2 knowledge rather than L1 transfer, one could question whether this is even more the case in highly advanced to near-native L2 learners with typologically distant languages.

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Appendix A: Stimuli exp 1 - Magnitude Estimation Task (possessives)

English

	Common noun		Length	Frequency (log)
A	president		9	2.12
	chef		4	0.48
	doctor		6	2.12
	queen		5	1.70
		AVG	6	1.60
		SD	1.87	0.67
B	king		4	1.95
	priest		6	1.51
	queen		5	1.70
	plumber		7	0.48
		AVG	5.5	1.41
		SD	1.12	0.56
C	plane		5	1.65
	pizza		5	0.30
	watch		5	1.57
	tiara		5	0.00
		AVG	5	0.88
		SD	0	0.74
D	bodyguard		9	0.30
	doctor		6	2.12
	death		5	2.35
	son		3	2.20
		AVG	5.75	1.74
		SD	2.17	0.84

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.70 > 0.0083$, n.s.	$p = 0.71 > 0.0083$, n.s.
A-C	$p = 0.39 > 0.0083$, n.s.	$p = 0.26 > 0.0083$, n.s.
A-D	$p = 0.88 > 0.0083$, n.s.	$p = 0.83 > 0.0083$, n.s.
B-C	$p = 0.47 > 0.0083$, n.s.	$p = 0.36 > 0.0083$, n.s.
B-D	$p = 0.86 > 0.0083$, n.s.	$p = 0.59 > 0.0083$, n.s.
C-D	$p = 0.57 > 0.0083$, n.s.	$p = 0.23 > 0.0083$, n.s.

Bonferroni corrected p value: 0.05/6 = 0.0083

I. Prenominal genitive, common noun possessor, inanimate possessum	**Words**	**Length**
1. The president's plane was damaged during its first flight.	9	58
2. The chef's pizza is famous for its spiciness.	8	45
3. The nurse smashed the doctor's watch outside the ward.	9	54
4. Pete saw the queen's tiara on television.	7	41
AVG	8.25	49.5
SD	0.83	6.80
II. Postnominal genitive, common noun possessor, inanimate possessum		
1. The plane of the president was damaged during its first flight.	11	63
2. The pizza of the chef is famous for its spiciness.	10	50
3. The nurse smashed the watch of the doctor outside the ward.	11	59
4. Pete saw the tiara of the queen on television.	9	46
AVG	10.25	54.5
SD	0.83	6.80
III. Prenominal genitive, proper noun possessor, inanimate possessum		
1. John's plane was damaged during its first flight.	8	49
2. Derek's pizza is famous for its spiciness.	7	42
3. The nurse smashed Paul's watch outside the ward.	8	48
4. Pete saw Victoria's tiara on television.	6	40
AVG	7.25	44.75
SD	0.83	3.83
IV. Postnominal genitive, proper noun possessor, inanimate possessum		
1. The plane of John was damaged during its first flight.	10	54
2. The pizza of Derek is famous for its spiciness.	9	47
3. The nurse smashed the watch of Paul outside the ward.	10	53
4. Pete saw the tiara of Victoria on television.	8	45
AVG	9.25	49.75
SD	0.83	3.83
V. Prenominal genitive, common noun possessor, animate possessum		
1. The King's bodyguard took the bullet in the chest.	9	50
2. The priest's doctor passed on the sad news to my grandmother.	11	61
3. Downing Street announced the Queen's death in a press conference.	10	65
4. My father punished the plumber's son for the damage.	9	52
AVG	9.75	57
SD	0.83	6.20
VI. Postnominal genitive, common noun possessor, animate possessum		
1. The bodyguard of the King took the bullet in the chest.	11	55
2. The doctor of the priest passed on the sad news to my grandmother.	13	66
3. Downing Street announced the death of the Queen in a press conference.	12	70
4. My father punished the son of the plumber for the damage.	11	57
AVG	11.75	62
SD	0.83	6.20

VII. Prenominal genitive, proper noun possessor, animate possessum	**Words**	**Length**
1. Henry's bodyguard took the bullet in the chest.	8	47
2. Patrick's doctor passed on the sad news to my grandmother.	10	58
3. Downing Street announced Elizabeth's death in a press conference.	9	65
4. My father punished Harold's son for the damage.	8	47
AVG	8.75	54.25
SD	0.83	7.66
VIII. Postnominal genitive, proper noun possessor, animate possessum		
1. The bodyguard of Henry took the bullet in the chest.	10	52
2. The doctor of Patrick passed on the sad news to my grandmother.	12	63
3. Downing Street announced the death of Elizabeth in a press conference.	11	70
4. My father punished the son of Harold for the damage.	10	52
AVG	10.75	59.25
SD	0.83	7.66

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 0.03 > 0.0125$, n.s.	$p = 0.40 > 0.0125$, n.s.
III-IV	$p = 0.03 > 0.0125$, n.s.	$p = 0.16 > 0.0125$, n.s.
V-VI	$p = 0.03 > 0.0125$, n.s.	$p = 0.36 > 0.0125$, n.s.
VII-VIII	$p = 0.03 > 0.0125$, n.s.	$p = 0.45 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Dutch

	Common noun		Length	Frequency (log)
A	president		9	1.70
	chefkok		7	0.00
	dokter		6	2.11
	koningin		8	1.60
		AVG	7.5	1.35
		SD	1.12	0.80
B	koning		6	1.94
	priester		8	1.43
	koningin		8	1.60
	loodgieter		10	0.00
		AVG	8	1.24
		SD	1.41	0.74
C	vliegtuig		9	1.57
	pizza		5	0.00
	horloge		7	1.51
	tiara		5	0.00
		AVG	6.5	0.77
		SD	1.66	0.77
D	bodyguard		9	0.00
	dokter		6	2.11
	dood		4	2.05
	zoon		4	2.18
		AVG	5.75	1.58
		SD	2.05	0.92

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.65 > 0.0083$, n.s.	$p = 0.87 > 0.0083$, n.s.
A-C	$p = 0.42 > 0.0083$, n.s.	$p = 0.40 > 0.0083$, n.s.
A-D	$p = 0.24 > 0.0083$, n.s.	$p = 0.75 > 0.0083$, n.s.
B-C	$p = 0.28 > 0.0083$, n.s.	$p = 0.47 > 0.0083$, n.s.
B-D	$p = 0.17 > 0.0083$, n.s.	$p = 0.63 > 0.0083$, n.s.
C-D	$p = 0.64 > 0.0083$, n.s.	$p = 0.28 > 0.0083$, n.s.

Bonferroni corrected p value: 0.05/6 = 0.0083

I. Prenominal genitive, common noun possessor, inanimate possessum	**Words**	**Length**
1. De presidents vliegtuig was beschadigd tijdens de eerste vlucht.	9	64
2. De chefkok z'n pizza is berucht om z'n pittigheid.	9	50
3. De verpleegster vernielde de dokters horloge in de zaal.	9	56
4. Peter zag de koningin haar tiara op televisie.	8	46
AVG	8.75	54
SD	0.43	6.78
II. Postnominal genitive, common noun possessor, inanimate possessum		
1. Het vliegtuig van de president was beschadigd tijdens de eerste vlucht.	11	71
2. De pizza van de chefkok is berucht om z'n pittigheid.	10	53
3. De verpleegster vernielde het horloge van de dokter in de zaal.	11	63
4. Peter zag de tiara van de koningin op televisie.	9	48
AVG	10.25	58.75
SD	0.83	8.90
III. Prenominal genitive, proper noun possessor, inanimate possessum		
1. Jans vliegtuig was beschadigd tijdens de eerste vlucht.	8	55
2. Dirk z'n pizza is berucht om z'n pittigheid.	8	44
3. De verpleegster vernielde Pauls horloge in de zaal.	8	51
4. Peter zag Beatrix haar tiara op televisie.	7	42
AVG	7.75	48
SD	0.43	5.24
IV. Postnominal genitive, proper noun possessor, inanimate possessum		
1. Het vliegtuig van Jan was beschadigd tijdens de eerste vlucht.	10	62
2. De pizza van Dirk is berucht om z'n pittigheid.	9	47
3. De verpleegster vernielde het horloge van Paul in de zaal.	10	58
4. Peter zag de tiara van Beatrix op televisie.	8	44
AVG	9.25	52.75
SD	0.83	7.46
V. Prenominal genitive, common noun possessor, animate possessum		
1. De konings bodyguard ving de kogel op met z'n borst.	10	52
2. De priester z'n dokter gaf het trieste nieuws door aan m'n oma.	12	63
3. Het Binnenhof verkondigde de koningins dood op de persconferentie.	9	66
4. Mijn vader strafte de loodgieter z'n zoon voor de schade.	10	57
AVG	10.25	59.5
SD	1.09	5.41
VI. Postnominal genitive, common noun possessor, animate possessum		
1. De bodyguard van de koning ving de kogel op met z'n borst.	12	58
2. De dokter van de priester gaf het trieste nieuws door aan m'n oma.	13	66
3. Het Binnenhof verkondigde de dood van de koningin op de persconferentie.	11	72
4. Mijn vader strafte de zoon van de loodgieter voor de schade.	11	60
AVG	11.75	64
SD	0.83	5.48

VII. Prenominal genitive, proper noun possessor, animate possessum	**Words**	**Length**
1. Willems bodyguard ving de kogel op met z'n borst.	9	49
2. Patrick z'n dokter gaf het trieste nieuws door aan m'n oma.	11	59
3. Het Binnenhof verkondigde Juliana's dood op de persconferentie.	8	63
4. Mijn vader strafte Harold z'n zoon voor de schade.	9	50
AVG	9.25	55.25
SD	1.09	5.93
VIII. Postnominal genitive, proper noun possessor, animate possessum		
1. De bodyguard van Willem ving de kogel op met z'n borst.	11	55
2. De dokter van Patrick gaf het trieste nieuws door aan m'n oma.	12	62
3. Het Binnenhof verkondigde de dood van Juliana op de persconferentie.	10	68
4. Mijn vader strafte de zoon van Harold voor de schade.	10	53
AVG	10.75	59.5
SD	0.83	5.94

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 0.03 > 0.0125$, n.s.	$p = 0.49 > 0.0125$, n.s.
III-IV	$p = 0.03 > 0.0125$, n.s.	$p = 0.40 > 0.0125$, n.s.
V-VI	$p = 0.11 > 0.0125$, n.s.	$p = 0.35 > 0.0125$, n.s.
VII-VIII	$p = 0.11 > 0.0125$, n.s.	$p = 0.41 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix B: Stimuli exp 2 - Syntactic Priming Task (possessives)

	Common noun	Length	Frequency (log)
A	chef	4	0.48
	doctor	6	2.12
	queen	5	1.70
	pilot	5	1.11
	ballerina	9	0.00
	pirate	6	0.48
	soldier	7	1.42
	fireman	7	0.00
	clown	5	0.48
	policeman	9	1.34
	king	4	1.95
	cowboy	6	0.70
	butcher	7	0.00
	baker	5	1.18
	diver	5	0.00
	Eskimo	6	0.00
	AVG	**6**	**0.81**
	SD	**1.46**	**0.72**
B	mouse	5	0.90
	goldfish	8	0.00
	swan	4	0.70
	snake	5	1.15
	cat	3	1.61
	parrot	6	0.48
	dog	3	1.84
	turtle	6	0.00
	monkey	6	0.95
	spider	6	0.60
	lion	4	0.90
	horse	5	1.93
	pig	3	1.26
	rabbit	6	1.04
	lizard	6	0.30
	seal	4	0.70
	AVG	**5**	**0.90**
	SD	**1.37**	**0.56**

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.06 > 0.05$, n.s.	$p = 0.71 > 0.05$, n.s.

I. Prenominal genitives	**Words**	**Length**
1. That is the chef's mouse.	5	25
2. It is the doctor's goldfish.	5	28
3. It is the queen's swan.	5	23
4. It is the pilot's snake.	5	24
5. That is the ballerina's cat.	5	28
6. That is the pirate's parrot.	5	28
7. There goes the soldier's dog.	5	29
8. This is the fireman's turtle.	5	29
9. There is the clown's monkey.	5	28
10. This is the policeman's spider.	5	31
11. This is the king's lion.	5	24
12. There goes the cowboy's horse.	5	30
13. It is the butcher's pig.	5	24
14. It is the baker's rabbit.	5	25
15. There goes the diver's lizard.	5	30
16. That is the Eskimo's seal.	5	26
AVG	**5**	**27**
SD	**0**	**2.47**

II. Postnominal genitives	**Words**	**Length**
1. That is the mouse of the chef.	7	30
2. It is the goldfish of the doctor.	7	33
3. It is the swan of the queen.	7	28
4. It is the snake of the pilot.	7	29
5. That is the cat of the ballerina.	7	33
6. That is the parrot of the pirate.	7	33
7. There goes the dog of the soldier.	7	34
8. This is the turtle of the fireman.	7	34
9. There is the monkey of the clown.	7	33
10. This is the spider of the policeman.	7	36
11. This is the lion of the king.	7	29
12. There goes the horse of the cowboy.	7	35
13. It is the pig of the butcher.	7	29
14. It is the rabbit of the baker.	7	30
15. There goes the lizard of the diver.	7	35
16. That is the seal of the Eskimo.	7	31
AVG	**7**	**32**
SD	**0**	**2.47**

***t*-tests**	**Word count**	**Sentence length**
I-II	p = DIV/0	p = 5.2e-06 < 0.05, sign

Appendix C: Stimuli exp 3 - Magnitude Estimation Task (V2)

English – Locative inversions

A	Unergatives	Length	Frequency (log)
	sang	4	0.70
	worked	6	1.46
	slept	5	0.85
	chattered	9	0.00
	lived	5	1.45
	AVG	5.8	0.89
	SD	1.72	0.54

B	Unaccusatives	Length	Frequency (log)
	appeared	8	1.40
	arrived	7	1.34
	emerged	7	0.85
	died	4	1.40
	went	4	2.24
	AVG	6	1.44
	SD	1.67	0.45

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.87 > 0.05$, n.s.	$p = 0.15 > 0.05$, n.s.

I. Light unergative	**Words**	**Length**
1. On the stage sang some performers.	6	34
2. In the factory worked female technicians.	6	41
3. In the tree slept little monkeys.	6	33
4. In the living room chattered someone.	6	37
5. In the cave lived bats.	5	23
AVG	5.8	33.6
SD	0.40	5.99
II. Light unaccusative		
1. On the stage appeared some performers.	6	39
2. In the factory arrived female technicians.	6	42
3. In the tree emerged little monkeys.	6	35
4. In the living room died someone.	6	32
5. In the cave went bats.	5	22
AVG	5.8	34
SD	0.40	6.90
III. Heavy unergative		
1. On the stage sang The Beatles.	6	30
2. In the factory worked Jill and Judy.	7	36
3. In the tree slept Leo the orang utan.	8	37
4. In the living room chattered Lizzy.	6	35
5. In the cave lived Batman.	5	25
AVG	6.4	32.6
SD	1.02	4.50
IV. Heavy unaccusative		
1. On the stage appeared The Beatles.	6	34
2. In the factory arrived Jill and Judy.	7	37
3. In the tree emerged Leo the orang utan.	8	39
4. In the living room died Lizzy.	6	30
5. In the cave went Batman.	5	24
AVG	6.4	32.8
SD	1.02	5.34

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 0.93 > 0.0125$, n.s.
I-III	$p = 0.31 > 0.0125$, n.s.	$p = 0.80 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 0.96 > 0.0125$, n.s.
II-IV	$p = 0.31 > 0.0125$, n.s.	$p = 0.79 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

English - Preposed adverbials of manner

I. Negative V S	**Words**	**Length**
1. In no circumstances may the prisoners be released early.	9	56
2. Only one mountain have the guides climbed as high as this one.	12	62
3. Not a single time has Claire caught her husband cheating.	10	57
4. Under no condition is it permitted to run in the hallway.	11	57
5. Only once has John been stopped by the police.	9	46
AVG	10.2	55.6
SD	1.17	5.24
*II. *Negative S V*		
1. In no circumstances the prisoners may be released early.	9	56
2. Only one mountain the guides have climbed as high as this one.	12	62
3. Not a single time Claire has caught her husband cheating.	10	57
4. Under no condition it is permitted to run in the hallway.	11	57
5. Only once John has been stopped by the police.	9	46
AVG	10.2	55.6
SD	1.17	5.24
*III. *Positive V S*		
1. In certain circumstances may the prisoners be released early.	9	61
2. Several mountains have the guides climbed as high as this one.	11	62
3. Many times has Claire caught her husband cheating.	8	50
4. Under some conditions is it permitted to run in the hallway.	11	60
5. On multiple occasions has John been stopped by the police.	10	58
AVG	9.8	58.2
SD	1.17	4.31
IV. Positive S V		
1. In certain circumstances the prisoners may be released early.	9	61
2. Several mountains the guides have climbed as high as this one.	11	62
3. Many times Claire has caught her husband cheating.	8	50
4. Under some conditions it is permitted to run in the hallway.	11	60
5. On multiple occasions John has been stopped by the police.	10	58
AVG	9.8	58.2
SD	1.17	4.31

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
I-III	$p = 0.64 > 0.0125$, n.s.	$p = 0.47 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
II-IV	$p = 0.64 > 0.0125$, n.s.	$p = 0.47 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Dutch – Locative inversions

A	Unergatives	Length	Frequency (log)
	zong	4	1.30
	werkten	7	1.32
	sliepen	7	0.95
	kletste	7	0.30
	leefden	7	1.30
	AVG	6.4	1.04
	SD	1.2	0.39

B	Unaccusatives	Length	Frequency (log)
	verscheen	9	1.80
	arriveerden	11	0.60
	doken	5	0.78
	stierf	6	1.48
	gingen	6	2.29
	AVG	7.4	1.39
	SD	2.24	0.63

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.45 > 0.05$, n.s.	$p = 0.37 > 0.05$, n.s.

I. Light unergative	**Words**	**Length**
1. Op het podium zong een paar artiesten.	7	38
2. In de fabriek werkten vrouwelijke technici.	6	43
3. In de boom sliepen kleine aapjes.	6	33
4. In de woonkamer kletste iemand.	5	31
5. In de grot leefden vleermuizen.	5	31
AVG	5.8	35.2
SD	0.75	4.66
II. Light unaccusative		
1. Op het podium verscheen een paar artiesten.	7	43
2. In de fabriek arriveerden vrouwelijke technici.	6	47
3. In de boom doken kleine aapjes op.	7	34
4. In de woonkamer stierf iemand.	5	30
5. In de grot gingen vleermuizen.	5	30
AVG	6	36.8
SD	0.89	6.97
III. Heavy unergative		
1. Op het podium zong The Beatles.	6	31
2. In de fabriek werkten Jasmijn en Judith.	7	40
3. In de boom sliep Leo de Oerang Oetan.	8	37
4. In de woonkamer kletste Liesbeth.	5	33
5. In de grot leefde Batman.	5	25
AVG	6.2	33.2
SD	1.17	5.15
IV. Heavy unaccusative		
1. Op het podium verscheen The Beatles.	6	36
2. In de fabriek arriveerden Jasmijn en Judith.	7	44
3. In de boom dook Leo de Oerang Oetan op.	9	39
4. In de woonkamer stierf Liesbeth.	5	32
5. In de grot ging Batman.	5	23
AVG	6.4	34.8
SD	1.50	7.08

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 0.74 > 0.0125$, n.s.	$p = 0.71 > 0.0125$, n.s.
I-III	$p = 0.58 > 0.0125$, n.s.	$p = 0.58 > 0.0125$, n.s.
III-IV	$p = 0.84 > 0.0125$, n.s.	$p = 0.72 > 0.0125$, n.s.
II-IV	$p = 0.66 > 0.0125$, n.s.	$p = 0.70 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Dutch - Preposed adverbials of manner

I. Negative V S	**Words**	**Length**
1. In geen geval mogen de gevangenen eerder vrijgelaten worden.	9	60
2. Slechts één berg hebben de verkenners beklommen zo hoog als deze.	11	65
3. Geen één keer heeft Carla haar echtgenoot betrapt op overspel.	10	62
4. Onder geen enkele voorwaarde is het toegestaan om in de hal te rennen.	13	70
5. Slechts één keer is Jan door de politie aangehouden.	9	52
AVG	10.4	61.8
SD	1.50	5.95
*II. *Negative S V*		
1. In geen geval de gevangenen mogen eerder vrijgelaten worden.	9	60
2. Slechts één berg de verkenners hebben beklommen zo hoog als deze.	11	65
3. Geen één keer Carla heeft haar echtgenoot betrapt op overspel.	10	62
4. Onder geen enkele voorwaarde het is toegestaan om in de hal te rennen.	13	70
5. Slechts één keer Jan is door de politie aangehouden.	9	52
AVG	10.4	61.8
SD	1.50	5.95
*III. *Positive V S*		
1. In bepaalde gevallen mogen de gevangenen eerder vrijgelaten worden.	9	67
2. Verschillende bergen hebben de verkenners beklommen zo hoog als deze.	10	69
3. Meerdere malen heeft Carla haar echtgenoot betrapt op overspel.	9	63
4. Onder bepaalde voorwaarden is het toegestaan om in de hal te rennen.	12	68
5. Meerdere keren is Jan door de politie aangehouden.	8	50
AVG	9.6	63.4
SD	1.36	7.00
IV. Positive S V		
1. In bepaalde gevallen de gevangenen mogen eerder vrijgelaten worden.	9	67
2. Verschillende bergen de verkenners hebben beklommen zo hoog als deze.	10	69
3. Meerdere malen Carla heeft haar echtgenoot betrapt op overspel.	9	63
4. Onder bepaalde voorwaarden het is toegestaan om in de hal te rennen.	12	68
5. Meerdere keren Jan is door de politie aangehouden.	8	50
AVG	9.6	63.4
SD	1.36	7.00

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
I-III	$p = 0.45 > 0.0125$, n.s.	$p = 0.74 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
II-IV	$p = 0.45 > 0.0125$, n.s.	$p = 0.74 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix D: Stimuli exp 4 - Syntactic Priming Task (V2)

Locative inversions

A	Unergatives	Length	Frequency (log)
	sang	4	0.70
	worked	6	1.46
	slept	5	0.85
	swam	4	0.30
	lived	5	1.45
	danced	6	0.48
	skied	5	0.00
	drove	5	1.20
	studied	7	0.95
	fought	6	0.85
	AVG	5.3	0.82
	SD	0.9	0.45

B	Unaccusatives	Length	Frequency (log)
	appeared	8	1.40
	arrived	7	1.34
	vanished	8	0.78
	drowned	7	0.48
	died	4	2.24
	fell	4	1.43
	emerged	7	0.85
	crashed	7	0.30
	blushed	7	0.00
	slipped	7	0.78
	AVG	6.6	0.96
	SD	1.36	0.62

***t*-tests**	**Word length**	**Frequency (log)**
A-B	$p = 0.03 < 0.05$, sign	$p = 0.60 > 0.05$, n.s.

I. Locative inversions with unergative verbs		**Words**	**Length**
1. In the spotlight sang a rock star.		7	34
2. In the factory worked a woman.		6	30
3. In the palace slept a princess.		6	31
4. In the swimming pool swam a girl.		7	33
5. In the cave lived a brown bear.		7	31
6. On the golf course danced a grandfather.		7	40
7. In the mountains skied a boy.		6	29
8. On the road drove a police officer.		7	35
9. In the train studied a schoolboy.		6	33
10. In the mosque fought a fireman.		6	31
	AVG	6.5	32.7
	SD	0.5	3.00

II. Locative inversions with unaccusative verbs		**Words**	**Length**
1. In the spotlight appeared a rock star.		7	38
2. In the factory arrived a woman.		6	31
3. In the palace vanished a princess.		6	34
4. In the swimming pool drowned a girl.		7	36
5. In the cave died a brown bear.		7	30
6. On the golf course fell a grandfather.		7	38
7. In the mountains emerged a boy.		6	31
8. On the road crashed a police officer.		7	37
9. In the train blushed a schoolboy.		6	33
10. In the mosque slipped a fireman.		6	32
	AVG	6.5	34
	SD	0.5	2.90

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.05$, n.s.	$p = 0.36 > 0.05$, n.s.

Preposed adverbials of manner

III. Negative V S		**Words**	**Length**
1. In no circumstances may people smoke.		6	37
2. Only one time climbed the schoolgirl.		6	37
3. Not a single time prayed the man.		7	33
4. Under no condition is it permitted to run.		8	42
5. Only once has he been arrested.		6	31
6. Under no condition is it allowed to dive.		8	41
7. Never has the policeman fired his gun.		7	38
8. In no circumstances is alcohol allowed.		6	39
9. On no occasion have they fought.		6	32
10. Not a single time has she threatened him.		8	41
	AVG	6.8	37.1
	SD	0.87	3.73
*IV. *Negative S V*			
1. In no circumstances people may smoke.		6	37
2. Only one time the schoolgirl climbed.		6	37
3. Not a single time the man prayed.		7	33
4. Under no condition it is permitted to run.		8	42
5. Only once he has been arrested.		6	31
6. Under no condition it is allowed to dive.		8	41
7. Never the policeman fired his gun.		6	34
8. In no circumstances alcohol is allowed.		6	39
9. On no occasion they have fought.		6	32
10. Not a single time she has threatened him.		8	41
	AVG	6.7	36.7
	SD	0.90	3.82
*V. *Positive V S*			
1. In certain circumstances may people smoke.		6	42
2. Several times climbed the schoolgirl.		5	37
3. Many times prayed the man.		5	26
4. Under some conditions is it permitted to run.		8	45
5. On multiple occasions has he been arrested.		7	43
6. Under some conditions is it allowed to dive.		8	44
7. One time fired the policeman his gun.		7	37
8. In certain circumstances is alcohol allowed.		6	44
9. On several occasions have they fought.		6	38
10. Several times has she threatened him.		6	37
	AVG	6.4	39.3
	SD	1.02	5.40

VI. Positive S V		**Words**	**Length**
1. In certain circumstances people may smoke.		6	42
2. Several times the schoolgirl climbed.		5	37
3. Many times the man prayed.		5	26
4. Under some conditions it is permitted to run.		8	45
5. On multiple occasions he has been arrested.		7	43
6. Under some conditions it is allowed to dive.		8	44
7. One time the policeman fired his gun.		7	37
8. In certain circumstances alcohol is allowed.		6	44
9. On several occasions they have fought.		6	38
10. Several times she has threatened him.		6	37
	AVG	6.4	39.3
	SD	1.02	5.40

***t*-tests**	**Word count**	**Sentence length**
III-IV	$p = 0.81 > 0.0125$, n.s.	$p = 0.82 > 0.0125$, n.s.
V-VI	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
III-V	$p = 0.38 > 0.0125$, n.s.	$p = 0.33 > 0.0125$, n.s.
IV-VI	$p = 0.52 > 0.0125$, n.s.	$p = 0.25 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix E: Stimuli exps 5 & 6 - Syntactic Priming Task (preposed adverbials)

I. Negative V S	**Words**	**Length**
In no circumstances may you smoke.	6	34
Only one time climbed the girl.	6	31
Not a single time prayed the woman.	7	35
Under no condition is it permitted to run.	8	42
Only once has he been arrested.	6	31
Under no condition is it allowed to dive.	8	41
Never has the policeman fired his gun.	7	38
In no circumstances may you drink alcohol.	7	42
On no occasion fought the boxer.	6	32
Not a single time has she threatened him.	8	41
In no circumstances can you exceed the speed limit.	9	51
Only once have they consulted the manual.	7	41
Not a single time has the man cut the lawn.	10	43
Under no condition is it permitted to use your mobile phone.	11	60
Only once have I worn a seat belt.	8	34
Under no condition is it allowed to fire a gun.	10	47
Never has she recycled newspapers.	5	34
In no circumstances may you gossip.	6	36
On no occasion has he locked the door.	8	38
Not a single time have you washed your hands.	9	45
Under no condition can you use your laptop.	8	43
In no circumstances is he allowed to drive.	8	43
Not a single time has she walked the dog.	9	41
Under no condition is it allowed to cycle.	8	42
AVG	7.71	40.21
SD	1.46	6.52

II. *Negative S V	**Words**	**Length**
In no circumstances you may smoke.	6	34
Only one time the girl climbed.	6	31
Not a single time the woman prayed.	7	35
Under no condition it is permitted to run.	8	42
Only once he has been arrested.	6	31
Under no condition it is allowed to dive.	8	41
Never the policeman has fired his gun.	7	38
In no circumstances you may drink alcohol.	7	42
On no occasion the boxer fought.	6	32
Not a single time she has threatened him.	8	41
In no circumstances you can exceed the speed limit.	9	51
Only once they have consulted the manual.	7	41
Not a single time the man has cut the lawn.	10	43

	Words	Length
Under no condition it is permitted to use your mobile phone.	11	60
Only once I have worn a seat belt.	8	34
Under no condition it is allowed to fire a gun.	10	47
Never she has recycled newspapers.	5	34
In no circumstances you may gossip.	6	36
On no occasion he has locked the door.	8	38
Not a single time you have washed your hands.	9	45
Under no condition you can use your laptop.	8	43
In no circumstances he is allowed to drive.	8	43
Not a single time she has walked the dog.	9	41
Under no condition it is allowed to cycle.	8	42
AVG	7.71	40.21
SD	1.46	6.52

III. *Positive V S	**Words**	**Length**
In certain circumstances may you smoke.	6	39
Several times climbed the girl.	5	31
Many times prayed the woman.	5	28
Under some conditions is it permitted to run.	8	45
On multiple occasions has he been arrested.	7	43
Under some conditions is it allowed to dive.	8	44
One time has the policeman fired his gun.	8	41
In certain circumstances may you drink alcohol.	7	47
On several occasions fought the boxer.	6	38
Several times has she threatened him.	6	37
In certain circumstances can you exceed the speed limit.	9	56
Several times have they consulted the manual.	7	45
Many times has the man cut the lawn.	8	36
Under some conditions is it permitted to use your mobile phone.	11	63
On multiple occasions have I worn a seat belt.	9	46
Under some conditions is it allowed to fire a gun.	10	50
Many times has she recycled newspapers.	6	39
In certain circumstances may you gossip.	6	40
On several occasions has he locked the door.	8	44
Several times have you washed your hands.	7	41
Under some conditions can you use your laptop.	8	46
In certain circumstances is he allowed to drive.	8	48
Several times has she walked the dog.	7	37
Under some conditions is it allowed to cycle.	8	45
AVG	7.42	42.88
SD	1.44	7.23

IV. Positive S V		**Words**	**Length**
In certain circumstances you may smoke.		6	39
Several times the girl climbed.		5	31
Many times the woman prayed.		5	28
Under some conditions it is permitted to run.		8	45
On multiple occasions he has been arrested.		7	43
Under some conditions it is allowed to dive.		8	44
One time the policeman has fired his gun.		8	41
In certain circumstances you may drink alcohol.		7	47
On several occasions the boxer fought.		6	38
Several times she has threatened him.		6	37
In certain circumstances you can exceed the speed limit.		9	56
Several times they have consulted the manual.		7	45
Many times the man has cut the lawn.		8	36
Under some conditions it is permitted to use your mobile phone.		11	63
On multiple occasions I have worn a seat belt.		9	46
Under some conditions it is allowed to fire a gun.		10	50
Many times she has recycled newspapers.		6	39
In certain circumstances you may gossip.		6	40
On several occasions he has locked the door.		8	44
Several times you have washed your hands.		7	41
Under some conditions you can use your laptop.		8	46
In certain circumstances he is allowed to drive.		8	48
Several times she has walked the dog.		7	37
Under some conditions it is allowed to cycle.		8	45
	AVG	7.42	42.88
	SD	1.44	7.23

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
I-III	$p = 0.50 > 0.0125$, n.s.	$p = 0.20 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
II-IV	$p = 0.50 > 0.0125$, n.s.	$p = 0.20 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix F: Stimuli exp 7 - Speeded Grammaticality Judgements (preposed adverbials)

I. Negative V S	**Words**	**Length**
In no circumstances may the prisoners be released early today.	10	62
Only two mountains have the guides climbed as high as this one.	12	63
Not a single time has Claire struck her husband in the face.	12	60
Under no condition is it permitted to run in the hallway.	11	57
Only once has John been fined for speeding by the police.	11	57
Hardly ever has Peter called in sick for work.	9	46
Never before have the doctors seen such a miracle.	9	50
Rarely has Susan laughed at her father's expense.	8	49
Under no condition should you lose control in public.	9	53
Never before have I kissed a man underneath the mistletoe.	10	58
In no circumstances may you smoke weed in a cafe.	10	49
Only one time has the schoolgirl climbed that tree.	9	51
Not a single time has the desperate man prayed to God.	11	54
Not once have I driven a speed boat on my holiday trips.	12	56
Only once has he been reprimanded for inappropriate behaviour.	9	62
Under no condition is it allowed to dive in the swimming pool.	12	62
Never has the policeman pointed his gun at anyone.	9	50
In no circumstances are they allowed to drink alcohol in the stadium.	12	70
On no occasion have the boxers fought outside the ring.	10	55
Not a single time has she left him alone in the play park.	13	58
In no circumstances may you exceed the speed limit on the motorway.	12	67
Only once have they consulted the catalogue in the library.	10	59
Not a single time has the gardener cut the lawn in our back garden.	14	67
Under no condition is it permitted to use your mobile phone in the corridor.	14	76
Only once have I worn a seat belt in my friend's minivan.	12	57
Under no condition is it allowed to fire a gun in the forest.	13	61
Never has she deposited large sums of money at the bank.	11	56
In no circumstances may you gossip about your colleagues at work.	11	65
On no occasion has he locked the door at the animal laboratory.	12	63
Not a single time have you washed your hands before dinner.	11	59
Under no condition can you use your laptop for computer games.	11	62
In no circumstances is he allowed to drive his car at night.	12	60
AVG	10.97	58.56
SD	1.51	6.49

II. *Negative S V	**Words**	**Length**
In no circumstances the prisoners may be released early today.	10	62
Only two mountains the guides have climbed as high as this one.	12	63
Not a single time Claire has struck her husband in the face.	12	60
Under no condition it is permitted to run in the hallway.	11	57
Only once John has been fined for speeding by the police.	11	57
Hardly ever Peter has called in sick for work.	9	46
Never before the doctors have seen such a miracle.	9	50
Rarely Susan has laughed at her father's expense.	8	49
Under no condition you should lose control in public.	9	53
Never before I have kissed a man underneath the mistletoe.	10	58
In no circumstances you may smoke weed in a cafe.	10	49
Only one time the schoolgirl has climbed that tree.	9	51
Not a single time the desperate man has prayed to God.	11	54
Not once I have driven a speed boat on my holiday trips.	12	56
Only once he has been reprimanded for inappropriate behaviour.	9	62
Under no condition it is allowed to dive in the swimming pool.	12	62
Never the policeman has pointed his gun at anyone.	9	50
In no circumstances they are allowed to drink alcohol in the stadium.	12	70
On no occasion the boxers have fought outside the ring.	10	55
Not a single time she has left him alone in the play park.	13	58
In no circumstances you may exceed the speed limit on the motorway.	12	67
Only once they have consulted the catalogue in the library.	10	59
Not a single time the gardener has cut the lawn in our back garden.	14	67
Under no condition it is permitted to use your mobile phone in the corridor.	14	76
Only once I have worn a seat belt in my friend's minivan.	12	57
Under no condition it is allowed to fire a gun in the forest.	13	61
Never she has deposited large sums of money at the bank.	11	56
In no circumstances you may gossip about your colleagues at work.	11	65
On no occasion he has locked the door at the animal laboratory.	12	63
Not a single time you have washed your hands before dinner.	11	59
Under no condition you can use your laptop for computer games.	11	62
In no circumstances he is allowed to drive his car at night.	12	60
AVG	10.97	58.56
SD	1.51	6.49

III. *Positive V S	**Words**	**Length**
In certain circumstances may the prisoners be released early today.	10	67
Several mountains have the guides climbed as high as this one.	11	62
On many different occasions has Claire struck her husband in the face.	12	70
Under some conditions is it permitted to run in the hallway.	11	60
On multiple occasions has John been fined for speeding by the police.	12	69
On several occasions has Peter called in sick for work.	10	55
Two or three times before have the doctors seen such a miracle.	12	63
Often has Susan laughed at her father's expense.	8	48
In this specific case should you lose control in public.	10	56
Several times before have I kissed a man underneath the mistletoe.	11	66
In certain circumstances may you smoke weed in a cafe.	10	54
Several times has the schoolgirl climbed that tree.	8	51
Many times has the desperate man prayed to God.	9	47
Several times have I driven a speed boat on my holiday trips.	12	61
On multiple occasions has he been reprimanded for inappropriate behaviour.	10	74
Under some conditions is it allowed to dive in the swimming pool.	12	65
One time has the policeman pointed his gun at someone.	10	54
In certain circumstances are they allowed to drink alcohol in the stadium.	12	75
On several occasions have the boxers fought outside the ring.	10	61
Several times has she left him alone in the play park.	11	54
In certain circumstances may you exceed the speed limit on the motorway.	12	72
Several times have they consulted the catalogue in the library.	10	63
Many times has the gardener cut the lawn in our back garden.	12	60
Under some conditions is it permitted to use your mobile phone in the corridor.	14	79
On multiple occasions have I worn a seat belt in my friend's minivan.	13	69
Under some conditions is it allowed to fire a gun in the forest.	13	64
Many times has she deposited large sums of money at the bank.	12	61
In certain circumstances may you gossip about your colleagues at work.	11	70
On several occasions has he locked the door at the animal laboratory.	12	69
Several times have you washed your hands before dinner.	9	55
Under some conditions can you use your laptop for computer games.	11	65
In certain circumstances is he allowed to drive his car at night.	12	65
AVG	11	62.63
SD	1.39	7.74

IV. Positive S V	**Words**	**Length**
In certain circumstances the prisoners may be released early today.	10	67
Several mountains the guides have climbed as high as this one.	11	62
On many different occasions Claire has struck her husband in the face.	12	70
Under some conditions it is permitted to run in the hallway.	11	60
On multiple occasions John has been fined for speeding by the police.	12	69
On several occasions Peter has called in sick for work.	10	55
Two or three times before the doctors have seen such a miracle.	12	63
Often Susan has laughed at her father's expense.	8	48
In this specific case you should lose control in public.	10	56
Several times before I have kissed a man underneath the mistletoe.	11	66
In certain circumstances you may smoke weed in a cafe.	10	54
Several times the schoolgirl has climbed that tree.	8	51
Many times the desperate man has prayed to God.	9	47
Several times I have driven a speed boat on my holiday trips.	12	61
On multiple occasions he has been reprimanded for inappropriate behaviour.	10	74
Under some conditions it is allowed to dive in the swimming pool.	12	65
One time the policeman has pointed his gun at someone.	10	54
In certain circumstances they are allowed to drink alcohol in the stadium.	12	75
On several occasions the boxers have fought outside the ring.	10	61
Several times she has left him alone in the play park.	11	54
In certain circumstances you may exceed the speed limit on the motorway.	12	72
Several times they have consulted the catalogue in the library.	10	63
Many times the gardener has cut the lawn in our back garden.	12	60
Under some conditions it is permitted to use your mobile phone in the corridor.	14	79
On multiple occasions I have worn a seat belt in my friend's minivan.	13	69
Under some conditions it is allowed to fire a gun in the forest.	13	64
Many times she has deposited large sums of money at the bank.	12	61
In certain circumstances you may gossip about your colleagues at work.	11	70
On several occasions he has locked the door at the animal laboratory.	12	69
Several times you have washed your hands before dinner.	9	55
Under some conditions you can use your laptop for computer games.	11	65
In certain circumstances he is allowed to drive his car at night.	12	65
AVG	11	62.63
SD	1.39	7.74

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
I-III	$p = 0.93 > 0.0125$, n.s.	$p = 0.03 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
II-IV	$p = 0.93 > 0.0125$, n.s.	$p = 0.03 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix G: Stimuli exp 8 - Speeded Sentence Completion Task (preposed adverbials)

I. Negative V S	**Words**	**Length**
Not a single time (has she) walked (the dog at the local park).	13	59
Under no condition (are you) allowed (to cycle without lights in the dark).	13	71
Only once (has she) sent (him a post card after his accident).	12	58
Not once (has he) visited (his grandmother in the old people's home).	12	65
Under no condition (may you) sell (goods in the street without a licence).	13	70
Hardly ever (has he) complimented (her on her impressive achievements).	10	67
Under no condition (should you) eat (food past its sell by date).	12	61
In no circumstances (may you) shout (at a student in the classroom).	12	64
Not a single time (has our cat) caught (a mouse in our home).	13	57
Never (has our cat) scratched (a visitor in our house).	10	51
Only once (was the pop star) threatened (by a stalker).	10	51
Not a single time (has Mary) scored (a goal on the hockey field).	13	61
Under no condition (may you) drive (through a red light).	10	53
In no circumstances (can you) eat (food from the floor).	10	52
Rarely (has he) cooked (for his wife and children).	9	47
Hardly ever (is it necessary to) raise (your voice in an argument).	12	63
Not once (has he) shared (his food with his starving friends).	11	58
Under no condition (are you) allowed (to use my laptop).	10	52
On no occasion (has he) practised (the cello with the orchestra).	11	61
Never (has she) read (a book on politics with so much attention).	12	61
Only once (has she) washed (the car at a petrol station).	11	53
Not a single time (have they) taken (her out for a picnic).	12	55
Under no condition (can you) download (music from the internet).	10	60
In no circumstances (is it) allowed (to jump the queue at the supermarket).	13	71
Rarely (has he enjoyed) watching (a film as much as this one).	12	58
Hardly ever (have they) talked (about their loss after the tragic incident).	12	72
Not once (has he) caught (a fish during his fishing trips).	11	55
Under no condition (is it) allowed (to change trains during your journey).	12	70
In no circumstances (is it possible to) change (your social security number).	12	73
Not a single time (has Simon) helped (the teacher outside the classroom).	12	69
Not once (have they) used (their crampons on their winter climbs).	11	62
Under no condition (can you) take (alcohol with your medicine).	10	59
AVG	11.44	60.59
SD	1.14	6.99

II. *Negative S V	**Words**	**Length**
Not a single time (she has) walked (the dog at the local park).	13	59
Under no condition (you are) allowed (to cycle without lights in the dark).	13	71
Only once (she has) sent (him a post card after his accident).	12	58
Not once (he has) visited (his grandmother in the old people's home).	12	65
Under no condition (you may) sell (goods in the street without a licence).	13	70
Hardly ever (he has) complimented (her on her impressive achievements).	10	67
Under no condition (you should) eat (food past its sell by date).	12	61
In no circumstances (you may) shout (at a student in the classroom).	12	64
Not a single time (our cat has) caught (a mouse in our home).	13	57
Never (our cat has) scratched (a visitor in our house).	10	51
Only once (the pop star was) threatened (by a stalker).	10	51
Not a single time (Mary has) scored (a goal on the hockey field).	13	61
Under no condition (you may) drive (through a red light).	10	53
In no circumstances (you can) eat (food from the floor).	10	52
Rarely (he has) cooked (for his wife and children).	9	47
Hardly ever (it is necessary to) raise (your voice in an argument).	12	63
Not once (he has) shared (his food with his starving friends).	11	58
Under no condition (you are) allowed (to use my laptop).	10	52
On no occasion (he has) practised (the cello with the orchestra).	11	61
Never (she has) read (a book on politics with so much attention).	12	61
Only once (she has) washed (the car at a petrol station).	11	53
Not a single time (they have) taken (her out for a picnic).	12	55
Under no condition (you can) download (music from the internet).	10	60
In no circumstances (it is) allowed (to jump the queue at the supermarket).	13	71
Rarely (he has enjoyed) watching (a film as much as this one).	12	58
Hardly ever (they have) talked (about their loss after the tragic incident).	12	72
Not once (he has) caught (a fish during his fishing trips).	11	55
Under no condition (it is) allowed (to change trains during your journey).	12	70
In no circumstances (it is possible to) change (your social security number).	12	73
Not a single time (Simon has) helped (the teacher outside the classroom).	12	69
Not once (they have) used (their crampons on their winter climbs).	11	62
Under no condition (you can) take (alcohol with your medicine).	10	59
AVG	11.44	60.59
SD	1.14	6.99

III. *Positive V S	**Words**	**Length**
Several times (has she) walked (the dog at the local park).	11	55
Under some conditions (are you) allowed (to cycle without lights in the dark).	13	74
Several times (has she) sent (him a post card after his accident).	12	62
On multiple occasions (has he) visited (his grandmother in the old people's home).	13	78
Under some conditions (may you) sell (goods in the street without a licence).	13	73
Occasionally (has he) complimented (her on her impressive achievements).	9	68
Under some conditions (should you) eat (food past its sell by date).	12	64
In certain circumstances (may you) shout (at a student in the classroom).	12	69
Several times (has our cat) caught (a mouse in our home).	11	53
A few times (has our cat) scratched (a visitor in our house).	12	57
On several occasions (was the pop star) threatened (by a stalker).	11	62
Several times (has Mary) scored (a goal on the hockey field).	11	57
Under some conditions (may you) drive (through a red light).	10	56
In certain circumstances (can you) eat (food from the floor).	10	57
Occasionally (has he) cooked (for his wife and children).	9	53
Sometimes (is it necessary to) raise (your voice in an argument).	11	61
Several times (has he) shared (his food with his starving friends).	11	63
Under some conditions (are you) allowed (to use my laptop).	10	55
On several occasions (has he) practised (the cello with the orchestra).	11	67
Several times (has she) read (a book on politics with so much attention).	13	69
On a few occasions (has she) washed (the car at a petrol station).	13	62
On several occasions (have they) taken (her out for a picnic).	11	58
Under some conditions (can you) download (music from the internet).	10	63
In certain circumstances (is it) allowed (to jump the queue at the supermarket).	13	76
On a few occasions (has he enjoyed) watching (a film as much as this one).	15	70
Several times (have they) talked (about their loss after the tragic incident).	12	74
On multiple occasions (has he) caught (a fish during his fishing trips).	12	68
Under some conditions (is it) allowed (to change trains during your journey).	12	73
In certain circumstances (is it possible to) change (your social security number).	12	78
Occasionally (has Simon) helped (the teacher outside the classroom).	9	64
On a few occasions (have they) used (their crampons on their winter climbs).	13	72
Under some conditions (can you) take (alcohol with your medicine).	10	62
AVG	11.47	64.78
SD	1.39	7.39

IV. Positive S V	**Words**	**Length**
Several times (she has) walked (the dog at the local park).	11	55
Under some conditions (you are) allowed (to cycle without lights in the dark).	13	74
Several times (she has) sent (him a post card after his accident).	12	62
On multiple occasions (he has) visited (his grandmother in the old people's home).	13	78
Under some conditions (you may) sell (goods in the street without a licence).	13	73
Occasionally (he has) complimented (her on her impressive achievements).	9	68
Under some conditions (you should) eat (food past its sell by date).	12	64
In certain circumstances (you may) shout (at a student in the classroom).	12	69
Several times (our cat has) caught (a mouse in our home).	11	53
A few times (our cat has) scratched (a visitor in our house).	12	57
On several occasions (the pop star was) threatened (by a stalker).	11	62
Several times (Mary has) scored (a goal on the hockey field).	11	57
Under some conditions (you may) drive (through a red light).	10	56
In certain circumstances (you can) eat (food from the floor).	10	57
Occasionally (he has) cooked (for his wife and children).	9	53
Sometimes (it is necessary to) raise (your voice in an argument).	11	61
Several times (he has) shared (his food with his starving friends).	11	63
Under some conditions (you are) allowed (to use my laptop).	10	55
On several occasions (he has) practised (the cello with the orchestra).	11	67
Several times (she has) read (a book on politics with so much attention).	13	69
On a few occasions (she has) washed (the car at a petrol station).	13	62
On several occasions (they have) taken (her out for a picnic).	11	58
Under some conditions (you can) download (music from the internet).	10	63
In certain circumstances (it is) allowed (to jump the queue at the supermarket).	13	76
On a few occasions (he has enjoyed) watching (a film as much as this one).	15	70
Several times (they have) talked (about their loss after the tragic incident).	12	74
On multiple occasions (he has) caught (a fish during his fishing trips).	12	68
Under some conditions (it is) allowed (to change trains during your journey).	12	73
In certain circumstances (it is possible to) change (your social security number).	12	78
Occasionally (Simon has) helped (the teacher outside the classroom).	9	64
On a few occasions (they have) used (their crampons on their winter climbs).	13	72
Under some conditions (you can) take (alcohol with your medicine).	10	62
AVG	11.47	64.78
SD	1.39	7.39

***t*-tests**	**Word count**	**Sentence length**
I-II	$p = 1 > 0.0125$, n.s.	$p = 1 > 0.0125$, n.s.
I-III	$p = 0.92 > 0.0125$, n.s.	$p = 0.03 > 0.0125$, n.s.
III-IV	$p = 1 > 0.0125$, n.s.	$p = 0.96 > 0.0125$, n.s.
II-IV	$p = 0.92 > 0.0125$, n.s.	$p = 0.03 > 0.0125$, n.s.

Bonferroni corrected p value: 0.05/4 = 0.0125

Appendix H: Free speech tasks

I. Open questions

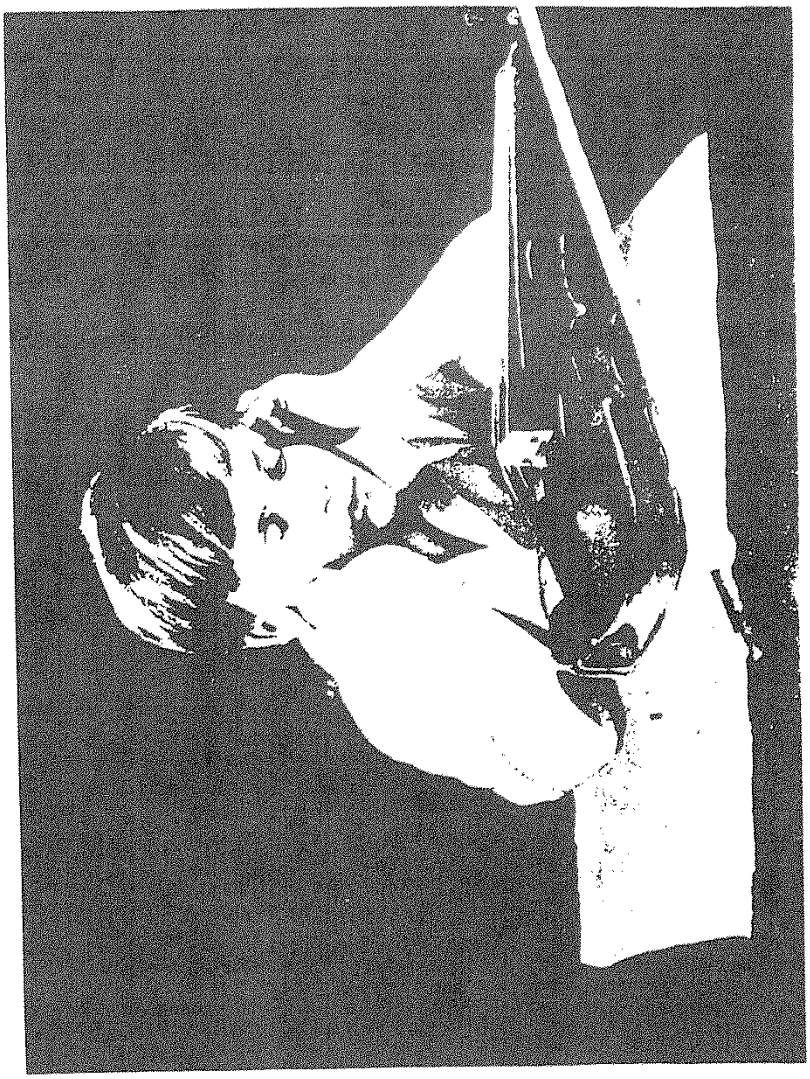
1. Do you think separate vacations are a good idea for married couples?
2. Is it a good idea to mix business with pleasure?
3. Is television a curse or a blessing?
4. Discuss the advantages and disadvantages of keeping secrets from your spouse or partner. Is honesty always the best policy?
5. What do you plan to do after you retire?
6. What do you consider the most important occupations in your society? Are they the highest paid?
7. Is stealing ever justified?
8. According to you what are the effects on our lives of violence in films or television.
9. Who would you like to be for a day? Why?
10. Tomorrow is your last day on earth. How would you like to spend it?

II. Scrupulous questions

1. You bump into an ex-lover and spend a wonderful completely innocent evening. Your mate believes you were working. Do you mention it?
2. One of your colleagues doesn't do his share of the work. You consider this unfair. Do you raise the problem with your boss?
3. You pick up a lottery ticket for a friend when you buy your own. The draw is held before you can deliver your friend's and she wins. Do you switch tickets?
4. Your performance as an athlete is slipping and you fear of being cut. A teammate gives you a drug which he credits for his success. Do you take it?
5. You are an off-duty police officer at a party. A group is sniffing cocaine. Do you arrest them?
6. You are selling your house because it has been burglarised several times. Interested buyers ask why you are selling. Do you give the true reason?

III. Thematic Apperception Test

Intro: Now we are going to show you some pictures. We would like you to describe the picture, and then we would like you to tell us what emotions the people are feeling, what might have happened to the person or the people before and after the scene in the picture.



Boy with violin:

- What does he want to do?

- Why is he sad?

- Do you play an instrument?

Woman entering room:

- Why did she go into the room?

- Who is she?

- What or who is she looking for?

- What is she going to do next?

Couple:

- What is the relationship between the two?

- Who has the stronger personality?

- What's the woman doing in the picture?

- Is he sad about leaving?

- Did the two have a fight?

- Are they on good terms?

IV. L2 proficiency criteria

You will listen to speech samples of both non-native and native speakers of English (of different dialects and accents). Your task is to evaluate each sample with respect to these criteria:

SYNTAX (*e.g.* word order)
LEXICON (*e.g.* appropriateness/precision of words used)
MORPHOLOGY (*e.g.* tense/agreement inflections)
PRONUNCIATION (*e.g.* accent, phonetic accuracy)
FLUENCY (*e.g.* rate of speech, ease of delivery)
OVERALL IMPRESSION (*e.g.* the extent to which the speaker speaks good English, on the basis of the above criteria).

You have been given an evaluation sheet (see other word document) for each speaker you will hear. The sheet has a continuous line next to each criterion, which is labelled 'non-native' at the left end and 'native' at the right end: please put a mark on each of these lines according to the closeness of the speech to either the native or the non-native ends.

So for example if you feel that Speaker 1's vocabulary is fully native, mark the corresponding line like this:

	NON-NATIVE	NATIVE
LEXICON		X

If your overall impression for Speaker 2 is that he/she is very good but not fully native, mark the corresponding line like this:

	NON-NATIVE	NATIVE
OVERALL IMPRESSION		X

If you find that the syntax of Speaker 3 is poor and he/she makes many mistakes, mark the line like this:

	NON-NATIVE	NATIVE
SYNTAX	X	

As we are interested in your first impressions, you may listen to each sample only ONCE! Once you have completed your evaluation for one speaker, you can move on to the next.

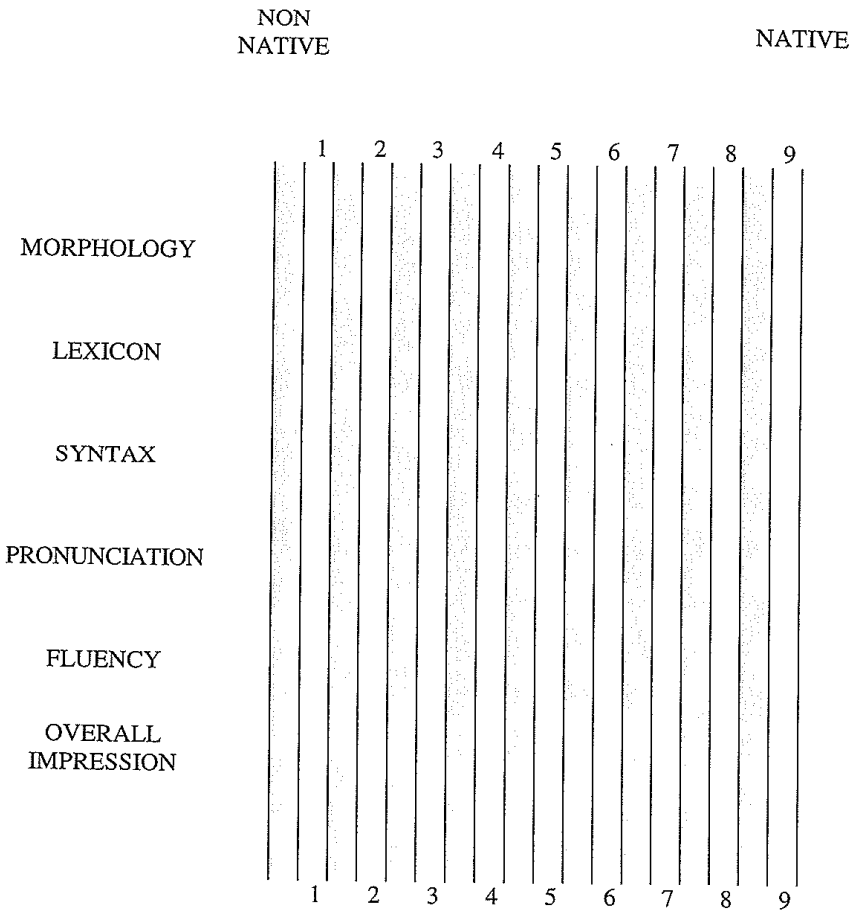
Thank you very much for your cooperation!

V. Scoring sheets

Evaluation Sheet:

Subject n. _____

	NON NATIVE	NATIVE
MORPHOLOGY	_____	
LEXICON	_____	
SYNTAX	_____	
PRONUNCIATION	_____	
FLUENCY	_____	
OVERALL IMPRESSION	_____	


NON
NATIVE
NATIVE
1 2 3 4 5 6 7 8 9
MORPHOLOGY
LEXICON
SYNTAX
PRONUNCIATION
FLUENCY
OVERALL
IMPRESSION
1 2 3 4 5 6 7 8 9

Appendix I: Consent forms

Native speakers of English: Please read the following information carefully. You can also request a copy for future reference.

Experiment: Online Picture Description Task
Experimenter: John-Sebastian Schutter
Affiliation: University of Edinburgh

DESCRIPTION: You are invited to participate in a research study that investigates language production under timed conditions. You will be presented with a set of sentences and pictures for a very brief period, and are asked to either read them out loud (for the sentences) or describe them (for the pictures). This will enable us to study in great detail how certain linguistic constructions are evaluated and produced under time constraints. Your voice will be recorded, but the data will be made anonymous.

TIME INVOLVEMENT: Your participation will take approximately 30 minutes.

PARTICIPANT'S RIGHTS: Please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study.

If you agree with the above-stated conditions and are willing to participate in the experiment, please sign below. By signing the form, you confirm that you meet the following conditions:

- You are a native speaker of English.
- You are at least 18 years old.
- You have read the above consent form, understood it and you agree to it.
- You want to participate in the above-mentioned experiment.

Date: _____ Signature: _____

Bio-data form

Age: _____

Sex: male / female

Which other language(s) do you speak:

_____

English dialect/accent you speak (Irish/Scottish/British/American *etc.*):

_____

Is the native language of one (or both) of your parents not English? Yes / No

Have you lived in a non-English speaking country for more than 6 months? Yes / No

Have you lived in a non-English speaking country for more than 3 years? Yes / No

What's the highest educational degree you obtained? *e.g.* BA / MA / PhD / other:

_____

And in what field? _____

Any other factors that might influence your proficiency in English (*e.g.* dyslexia *etc.*)?

_____

<u>Dutch learners of English</u>: Please read the following information carefully. You can also request a copy for future reference.

Experiment: Online Picture Description Task
Experimenter: John-Sebastian Schutter
Affiliation: University of Edinburgh

DESCRIPTION: You are invited to participate in a research study that investigates timed second language productions of near-native Dutch speakers of English. You will be presented with a set of sentences and pictures, and are asked to either read them out loud (for the sentences) or describe them (for the pictures). This will enable us to study in great detail how certain linguistic constructions are evaluated and produced under timed conditions. Your voice will be recorded, but the data will be made anonymous.

TIME INVOLVEMENT: Your participation will take approximately 30 minutes.

PARTICIPANT'S RIGHTS: Please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study.

If you agree with the above-stated conditions and are willing to participate in the experiment, please sign below. By signing the form, you confirm that you meet the following conditions:

- You are a native speaker of Dutch.
- You are at least 18 years old.
- You have read the above consent form, understood it and you agree to it.
- You want to participate in the above-mentioned experiment.

Date: _____ Signature: _____

Bio-data form

Age: _____

Sex: male / female

How old were you when you started to learn English (formal instruction)?

_____

Which other language(s) do you speak:

_____

English dialect you speak (Irish/Scottish/British/American/Australian *etc.*):

_____

Is the native language of one (or both) of your parents not Dutch? Yes / No

Have you lived in an English-speaking country for more than 6 months? Yes / No

Have you lived in an English-speaking country for more than 3 years? Yes / No

What's the highest educational degree you obtained? *e.g.* BA / MA / PhD / other:

_____

And in what field? _____

Any other factors that might influence your proficiency in English as a second language?

_____

Legend language abbreviations:

Br En = British English	Du = Dutch	Ir = Irish Gaelic	Ru = Russian	Ara = Arabic
Sc En = Scottish English	Afr = Afrikaans	Sc = Scottish Gaelic	Ka = Kazakh	La = Latin
Ir En = Irish English	Fri = Frisian	We = Welsh	Ne = Nepali	Gr = Greek (modern)
Am En = American English	Ge = German	Fr = French	Ma = Mandarin Chinese	Bul = Bulgarian
Can En = Canadian English	LS = Low Saxon	Sp = Spanish	Can = Cantonese	BSL = British Sign Language
Aus EN = Australian English	Da = Danish	Ca = Catalan	Jap = Japanese	DSL = Dutch Sign Language
NZ En = New Zealand English	Nor = Norwegian	Po = Portuguese	Ho = Hokien	N/A = Not Available
SA En = South African English	Swe = Swedish	It = Italian	In = Indonesian	
Ha = Hatian	Fi = Finnish	Cz = Czech	Viet = Vietnamese	
Lin = Lingala	Cro = Croatian	Pol = Polish	Tha = Thai	

Exp 1: Experimental group of 43 highly advanced Dutch learners of English (*CEFR level C1 and above, self-reported)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	19	F	Du	Br En, Fr, Ge	10	no	no	no	very advanced
2	19	F	Du	Br En, Fr, Ge	10	no	no	no	very advanced
3	25	F	Du	Br En, Ge	10	no	no	no	near-native
4	24	F	Du	Br En	12	no	no	no	advanced
5	20	M	Du	Br En	10	no	no	no	near-native
6	24	F	Du	Br En, Fr, Ge, Sp	12	no	no	no	advanced
7	23	M	Du	Br En, Ge	5	no	no	no	near-native
8	23	M	Du	Br En	6	no	no	no	near-native
9	22	M	Du	Br En, Ge	8	no	no	no	near-native
10	21	M	Du	Br En	10	no	no	no	near-native
11	20	M	Du	Br En, Ge	11	no	no	no	near-native
12	23	F	Du	Br En	8	no	no	no	very advanced
13	19	F	Du	Br En	8	no	no	no	very advanced
14	25	F	Du	Br En, Fr	11	no	no	no	very advanced
15	24	F	Du	Br En	10	no	no	no	advanced
16	23	F	Du	Br En	10	no	no	no	near-native
17	20	F	Du	Br En, Fr, Ge	7	no	no	no	near-native
18	21	F	Du	Br En, Fr	10	no	no	no	near-native
19	19	F	Du	Br En, Sp	10	no	no	no	advanced
20	24	F	Du	Am En	6	no	no	no	advanced
21	20	F	Du	Br En, Viet	5	no	no	no	advanced
22	26	F	Du	Br En, Jap	12	no	no	no	very advanced
23	21	F	Du	Br En, Fr, Sp	10	no	no	no	advanced
24	19	F	Du	Br En	11	no	no	no	advanced
25	22	F	Du	Br En, Fr, Ge, Sp	10	no	no	no	near-native

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
26	20	F	Du	Br En	8	no	no	no	near-native
27	20	F	Du	Br En	10	no	no	no	very advanced
28	21	M	Du	Br En, Fr, Ge	12	no	no	no	very advanced
29	21	F	Du	Br En, Ge	10	no	yes	yes	near-native
30	20	F	Du	Br En	10	no	no	no	advanced
31	21	F	Du	Br En	5	no	yes	yes	advanced
32	23	M	Du	Br En, Ge, Jap	11	no	no	no	near-native
33	24	M	Du	Br En	7	no	yes	no	very advanced
34	45	M	Du	Br En, Fr, Ge, It	10	no	yes	no	near-native
35	21	F	Du	Br En	9	no	no	no	near-native
36	27	F	Du	Br En, Ge	11	yes	no	no	very advanced
37	22	F	Du	Br En	11	no	yes	no	very advanced
38	23	F	Du	Br En	12	no	no	no	very advanced
39	24	F	Du	Br En, Fr	10	no	yes	no	near-native
40	25	F	Du	Br En	5	yes	yes	no	very advanced
41	25	F	Du	Br En	6	no	yes	no	near-native
42	25	M	Du	Br En, Ge, Nor, LS	10	no	no	no	very advanced
43	25	F	Du	Br En, Fr, Ge	9	no	no	no	near-native

Exp 1: Control group of 20 native speakers of English recruited among students of Edinburgh University

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	28	F	Br En	Ge, Ir	no	no	no
2	28	F	Am En	Du, Ara	no	yes	yes
3	23	F	Br En	N/A	no	no	no
4	25	M	Am En	N/A	yes	no	no
5	24	F	Am En	Sp	no	no	no
6	23	F	Am En	Sp, Fr	yes	yes	no
7	25	F	Am En	Ru, Sp, Fr, Ka	yes	yes	yes
8	20	F	Br En	N/A	no	no	no
9	21	F	Am En	Sp	no	no	no
10	21	M	Br En	Fr	no	yes	no
11	23	F	Am En	N/A	yes	no	no
12	27	F	Sc En	Fr	no	no	no
13	21	F	Br En	N/A	no	no	no
14	24	F	Am En	Sp	yes	no	no
15	25	F	Br En	N/A	no	no	no
16	22	F	Am En	Sp	no	no	no
17	22	F	Br En	N/A	yes	no	no
18	33	F	NZ En	It, Tha	no	yes	yes
19	20	F	Br En	N/A	no	no	no
20	20	F	Can En	Fr	no	no	no

Exp 1: Control group of 22 native speakers of *ABN* Dutch from final forms (=pre-academic) at *Zandvliet College* secondary school

#	Age	Sex	L1
1	15	M	Du
2	15	M	Du
3	15	F	Du
4	15	F	Du
5	16	F	Du
6	16	F	Du
7	16	M	Du
8	15	M	Du
9	16	M	Du
10	15	M	Du
11	15	F	Du
12	16	F	Du
13	16	F	Du
14	15	F	Du
15	15	F	Du
16	14	M	Du
17	15	M	Du
18	16	M	Du
19	15	F	Du
20	15	M	Du
21	15	F	Du
22	16	F	Du

Exps 2&4: Experimental group of 24 highly advanced Dutch learners of English (12 advanced, 12 near-native, *as assessed by English NS)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	38	M	Du	Br En, Fr, Ge, DSL	12	no	no	no	advanced
2	37	F	Du	Am En, Ge, Fr	11	yes	yes	no	near-native
3	41	F	Du	Br En, Fr	11	no	yes	no	advanced
4	41	M	Du	Br En, Fr, Ge	12	no	yes	no	advanced
5	26	M	Du	Br En	11	no	no	no	advanced
6	36	M	Du	Br En, Ge	12	no	yes	no	advanced
7	55	M	Du	Br En, Ge, Fr, Nor	12	no	yes	no	near-native
8	47	F	Du	Br En, Ge, Fr, Ru	12	no	yes	no	advanced
9	27	F	Du	Br En, Ge	11	no	no	no	advanced
10	26	F	Du	Br En, Ge, Fr	10	no	no	no	near-native
11	30	F	Du	Br En, Ge, Fr	12	no	yes	no	near-native
12	27	F	Du	Ir En, Ge, Fr	10	no	yes	no	advanced
13	36	M	Du	Br En, Ne	11	no	yes	yes	advanced
14	64	M	Du	Br En, Ge	11	yes	no	no	advanced
15	40	M	Du	Br En, Ge, Fr	12	yes	yes	no	near-native
16	32	F	Du	Br En, Ge, Fr	11	no	yes	no	advanced
17	27	F	Du	Br En, Fr, Sp	9	yes	yes	yes	near-native
18	56	F	Du	Am En, Ge, Fr	10	yes	yes	yes	advanced
19	34	F	Du	Aus En, Fr, Ge	11	yes	yes	no	near-native
20	41	F	Du	Am En, Ge, Fr	11	no	yes	no	near-native
21	23	F	Du	Br En, Ge, Fr, Swe	10	yes	no	no	near-native
22	29	F	Du	Br En, Fr, Ge, Fi	12	no	yes	no	near-native
23	51	F	Du	Br En, Ge, Sp	12	no	yes	no	near-native
24	38	M	Du	Br En, Fr, Ge	12	no	yes	no	near-native

Exps 2&4: Control group of 24 native speakers of English recruited among students of Edinburgh University

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	24	F	Am En	Da	no	yes	no
2	31	M	SA En	Afr, Ma	yes	yes	yes
3	27	F	Br En	N/A	yes	no	no
4	25	M	Br En	Fr	no	yes	no
5	22	F	Br En	N/A	no	no	no
6	26	M	Am En	Sc, Fr, It	no	yes	yes
7	22	F	Can En	Bul, Fr	yes	no	no
8	27	F	Sc En	N/A	no	no	no
9	17	F	Am En	N/A	yes	no	no
10	23	F	Am En	Sp, Ge	no	no	no
11	22	F	Am En	Fr, La, Gr	no	yes	no
12	29	F	Am En	Sp	yes	yes	yes
13	21	F	Br En	N/A	no	no	no
14	20	F	Am En	Sp	no	no	no
15	26	F	Br En	Sp	no	no	no
16	22	M	Am En	N/A	no	yes	no
17	26	M	Ir En	Fr	no	no	no
18	19	F	Br En	Sc, Fr	no	no	no
19	19	M	Br En	Sp, It, Po	no	no	no
20	21	F	Br En	Fr, Sp	no	no	no
21	24	F	Br En	N/A	yes	no	no
22	25	M	Am En	N/A	no	no	no
23	26	M	Br En	N/A	no	no	no
24	20	F	Am En	Sp	no	no	no

Exp 3: Experimental group of 36 highly advanced Dutch learners of English (*CEFR level C1 and above, self-reported)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	43	F	Du	Br En	5	no	yes	yes	near-native
2	26	M	Du	Br En	4	yes	yes	no	near-native
3	24	F	Du	Br En	6	no	yes	no	near-native
4	21	F	Du	Br En	12	no	no	no	very advanced
5	32	M	Du	Br En	10	no	yes	no	near-native
6	45	F	Du	Br En	11	no	no	no	very advanced
7	28	F	Du	Br En, Ge	12	no	no	no	very advanced
8	24	M	Du	Br En, Ge	10	no	no	no	very advanced
9	24	F	Du	Br En	6	no	no	no	very advanced
10	23	F	Du	Br En	8	no	no	no	near-native
11	23	F	Du	Br En, Fr, Ge	10	no	no	no	near-native
12	23	F	Du	Br En, Fri	10	no	no	no	near-native
13	20	M	Du	Br En, Fr, Ge	10	no	no	no	advanced
14	23	F	Du	Br En	11	no	no	no	near-native
15	23	F	Du	Br En	12	no	no	no	very advanced
16	31	F	Du	Br En, Fr, Ge	10	no	yes	no	near-native
17	22	F	Du	Br En, Ma	5	yes	yes	no	advanced
18	33	F	Du	Br En, Da, Fr	9	no	yes	yes	near-native
19	22	F	Du	Br En	8	no	no	no	near-native
20	24	F	Du	Br En, Fri	8	no	no	no	near-native
21	21	F	Du	Br En, Fri	5	no	no	no	very advanced
22	29	F	Du	Br En, Fr, Ge	11	no	no	no	very advanced
23	23	F	Du	Br En, Sp, Fr, Ge	11	no	yes	yes	very advanced
24	20	F	Du	Br En	10	no	no	no	advanced
25	20	F	Du	Br En, Sp	10	no	no	no	advanced

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
26	20	F	Du	Br En	6	no	no	no	very advanced
27	21	F	Du	Br En, Ge	10	no	no	no	advanced
28	27	F	Du	Br En, Sp, Ca, Fr, Ge, It	10	no	no	no	advanced
29	27	F	Du	Br En	10	no	no	no	advanced
30	21	F	Du	Br En	10	no	no	no	advanced
31	22	F	Du	Br En, Fr, Ge	10	no	no	no	very advanced
32	22	F	Du	Br En, Fr, Ge	11	no	no	no	very advanced
33	24	F	Du	Br En, Swe	8	no	yes	no	near-native
34	24	F	Du	Br En, Ge, Sp	6	no	yes	no	very advanced
35	23	F	Du	Br En, Ge, Fr	4	no	yes	no	near-native
36	25	F	Du	Br En, Sp	10	no	no	no	very advanced

Exp 3: Control group of 20 native speakers of English recruited among the students of Edinburgh University

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	24	M	Br En	Ge, Fr, BSL	no	no	no
2	28	F	Am En	Gr, Swe	yes	yes	yes
3	30	F	Br En	Ge	no	yes	no
4	23	F	Br En	N/A	no	no	no
5	28	F	Am En	Ha, Fr	no	no	no
6	26	F	Can En	Ge	no	no	no
7	31	M	Am En	Sp, Cz	no	yes	yes
8	31	M	Aus En	N/A	no	no	no
9	28	F	Am En	Jap, Sp	no	no	no
10	22	M	Sc En	N/A	no	no	no
11	20	F	Br En	Fr, Ge	no	no	no
12	26	M	Can En	Sp, Fr	yes	no	no
13	22	F	Br En	Nor, Ge	no	yes	no
14	21	F	Br En	Fr	no	no	no
15	25	F	Sc En	Fr, Sp	no	no	no
16	22	M	Br En	N/A	yes	no	no
17	22	F	Can En	Fr	no	no	no
18	20	F	Sc En	N/A	yes	no	no
19	23	F	Br En	Sp	no	no	no
20	21	F	Am En	Fr	no	no	no

Exp 3: Control group of 21 native speakers of *ABN* Dutch mostly from final forms (=pre-academic) at *Zandvliet College* secondary school

#	Age	Sex	L1
1	23	F	Du
2	33	F	Du
3	15	F	Du
4	14	M	Du
5	14	M	Du
6	14	M	Du
7	14	F	Du
8	14	M	Du
9	55	F	Du
10	54	M	Du
11	14	F	Du
12	14	M	Du
13	14	M	Du
14	15	M	Du
15	14	F	Du
16	14	F	Du
17	14	F	Du
18	14	F	Du
19	13	M	Du
20	15	F	Du
21	15	F	Du

Exp 5: Experimental group of 18 advanced Dutch learners of English (*L2 proficiency assessed through Oxford Placement Task)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	23	F	Du, Fri	Br En, Fr, Ge	11	no	no	no	99%
2	26	M	Du	Br En, Ho	10	yes	no	no	90%
3	25	M	Du	Br En, Fr, Ge	12	no	no	no	87%
4	29	M	Du	Br En	10	no	no	no	86%
5	31	M	Du	Br En, Fr, Ge	10	no	no	no	82%
6	30	M	Du	Br En, Ge, Fr	11	no	no	no	87%
7	31	F	Du	Br En	10	yes	no	no	N/A
8	33	F	Du	Br En, Ge, Fr	11	no	no	no	N/A
9	23	F	Du	Am En, Ma	11	yes	no	no	78%
10	21	F	Du	Br En, Ru, Ge	12	yes	no	no	N/A
11	20	M	Du	Am En, Fr, Sp	12	no	yes	no	N/A
12	20	M	Du	Br En, Ge	11	no	no	no	60%
13	22	F	Du, Fri	Am En, Ge	11	yes	no	no	97%
14	25	M	Du	Am En, Ma	10	no	no	no	82%
15	22	F	Du	Am En, Ge	10	yes	yes	no	N/A
16	19	M	Du	Br En	10	yes	no	no	N/A
17	22	M	Du	Am En, Ge, Fr	10	no	no	no	83%
18	25	F	Du, Fri	Br En, Ge, Fr	11	no	no	no	94%

N/A = These participtants did not want to take the post-experiment L2 proficiency test. However, they were deemed highly proficient in their L2 English as judged on their oral interaction with the experimenter. To remedy this problem, participants were asked to take the L2 proficiency test before the experiment (in experiment 6), or were judged by an official objective third party (in experiments 7 & 8).

Exp 5: Control group of 20 native speakers of English recruited among students of the University of Edinburgh

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	25	M	Br En	N/A	no	no	no
2	24	M	Br En	Pol	no	yes	no
3	36	F	Sc En	N/A	yes	yes	yes
4	24	F	Ir En	Ir	no	no	no
5	23	F	SA En	Afr, Ge	no	no	no
6	22	F	Am En	Jap, Ma, Ru	yes	yes	no
7	20	M	Br En	N/A	no	no	no
8	21	F	Am En	Sp	yes	no	no
9	25	F	Br En	Ge, Fr, It	yes	no	no
10	25	F	Can En	Fr, Ge, Sp	no	yes	no
11	28	M	Br En	N/A	no	no	no
12	22	M	Am En	Sp	no	no	no
13	24	F	Sc En	N/A	no	no	no
14	26	M	Sc En	N/A	no	no	no
15	22	M	Br En	Fr	yes	no	no
16	31	M	Aus En	N/A	no	no	no
17	24	F	Br En	Sp, Ge	no	no	no
18	26	M	Am En	Fr	no	no	no
19	23	F	Am En	Fr	yes	yes	no
20	28	M	Am En	Fr, Sp, La	yes	yes	no

Exp 6: Experimental group of 22 advanced Dutch learners of English (*L2 proficiency assessed through Oxford Placement Task)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	33	M	Du	Br En, Sp, Ge, Fr	10	no	yes	no	90%
2	30	F	Du	Br En	10	no	no	no	70%
3	32	M	Du	Br En, Ge	10	yes	no	no	68%
4	24	F	Du	Am En, Ge, Fr	11	no	no	no	99%
5	29	F	Du	Br En, Fr, Ge, Fri, It	10	yes	no	no	99%
6	23	M	Du	Br En, Fr, Ge	10	no	no	no	93%
7	29	F	Du	Am En, Ma, In	10	yes	no	no	77%
8	33	M	Du	Br En, In	10	yes	yes	no	90%
9	32	M	Du	Br En, Fr, Ge	11	no	no	no	79%
10	30	M	Du	Br En, Po, It, Ge, Jap	11	no	no	no	91%
11	23	F	Du	Br En, Fr, Ge	8	no	no	no	89%
12	21	F	Du	Br En, Ge	11	no	no	no	76%
13	60	F	Du	Br En, Fr	6	yes	yes	no	78%
14	61	M	Du	Br En, Ge, Fr	12	no	no	no	68%
15	60	F	Du	Br En, Fr, Ge	12	yes	yes	no	86%
16	65	M	Du	Br En, Fr, Ge	12	no	no	no	65%
17	27	F	Du	Br En, Ge, Fr	10	no	no	no	69%
18	27	M	Du	Br En, Ge	8	no	no	no	81%
19	39	F	Du	Br En, Sp	12	no	no	no	88%
20	26	F	Du	Am En, Ma	10	yes	no	no	74%
21	30	F	Du	Am En, Pol	12	yes	yes	yes	89%
22	34	F	Du	Br En, Ge, Fr, It	12	no	yes	yes	95%

Exp 6: Control group of 22 native speakers of English recruited among students of the University of Edinburgh

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	19	F	Am En	Sp	yes	yes	yes
2	20	M	Br En	N/A	no	no	no
3	26	M	Am En	Fr	no	no	no
4	20	F	Br En	Fr	no	no	no
5	20	F	Br En	Fr	no	no	no
6	18	F	Sc En	Sp	no	no	no
7	18	M	SA En	Afr	no	no	no
8	20	F	Am En	Fr	no	no	no
9	21	M	Am En	Fr	yes	yes	no
10	20	M	Br En	Sp, Fr	no	no	no
11	21	M	Br En	Ru	no	yes	yes
12	18	F	Br En	N/A	no	no	no
13	19	M	Sc En	N/A	no	no	no
14	21	F	Br En	N/A	yes	no	no
15	19	F	Sc En	N/A	no	no	no
16	24	F	Am En	Sp	no	yes	no
17	30	F	Br En	Fr	no	yes	no
18	19	F	Br En	Fr, Ge	no	no	no
19	26	F	Can En	Ge, Fr	no	no	no
20	23	M	Br En	Ge	no	no	no
21	23	M	Br En	N/A	no	no	no
22	35	M	Sc En	N/A	no	no	no

Exps 7&8: Experimental group of 18 Dutch learners of English (*L2 proficiency assessed by lecturers at Radboud University Nijmegen)

#	Age	Sex	L1	L2	L2 En onset	Parents not Du NS?	in En community > 6 months?	> 3 years?	L2 proficiency*
1	21	F	Du	Br En, Ge	10	no	no	no	CEFR C1
2	22	M	Du	Am En, Sp, Ge, Cro	10	yes	no	no	CEFR C1
3	25	F	Du	Br En, Ge, Fr	12	no	no	no	CEFR C1
4	20	F	Du	Br En, Ge	10	yes	no	no	CEFR C1
5	20	M	Du	Br En	10	no	no	no	CEFR C1
6	22	F	Du	Br En, Ge, Fr	10	no	yes	no	CEFR C1
7	22	F	Du	Br En, Ge, Fr	10	yes	no	no	CEFR C1
8	21	F	Du	Br En, Ge	10	no	no	no	CEFR C1
9	32	F	Du	Br En, Ge, Fr, Lin, DSL	12	yes	yes	no	CEFR C1
10	19	F	Du	Br En, Fr, Ge	10	no	no	no	CEFR C1
11	19	F	Du	Br En, Ge	13	no	no	no	CEFR C1
12	18	F	Du	Br En, Fr	12	yes	no	no	CEFR C1
13	19	F	Du	Br En, Ge	12	no	no	no	CEFR C1
14	20	F	Du	Br En, Sp, Ge	11	no	no	no	CEFR C1
15	23	M	Du	Br En	7	yes	no	no	CEFR C1
16	18	F	Du	Br En	12	yes	no	no	CEFR C1
17	24	F	Du	Am En, Fr, Ge	11	yes	yes	no	CEFR C1
18	22	F	Du	Am En, Fri	10	yes	no	no	CEFR C1

Exps 7&8: Control group of 22 native speakers of English recruited among students of the University of Edinburgh

#	Age	Sex	L1	L2	Parents not En NS?	in non-En community > 6 months?	> 3 years?
1	27	F	Br En	Fr, It, Ge, Sp, Ma	no	yes	no
2	21	F	Sc En	Fr	no	yes	yes
3	21	F	Sc En	N/A	no	no	no
4	24	F	Sc En	N/A	no	no	no
5	27	F	Can En	Ge, Fr	yes	no	no
6	26	M	Br En	N/A	no	no	no
7	21	F	Br En	N/A	no	no	no
8	30	F	Am En	Sp	yes	yes	no
9	28	F	Br En	Sp	no	no	no
10	26	F	Sc En	Fr	no	no	no
11	25	F	Br En	Fr	no	no	no
12	26	F	Am En	Ru	yes	yes	yes
13	25	F	Br En	N/A	yes	no	no
14	20	F	Am En	Sp, Ma	yes	no	no
15	22	F	Br En	Fr	no	no	no
16	30	F	Am En	Ara, Sp	no	yes	yes
17	23	F	Am En	N/A	no	no	no
18	21	F	Br En	N/A	yes	yes	no
19	46	F	Sc En	Gr	no	yes	yes
20	33	F	Aus En	N/A	no	no	no
21	45	F	Sc En	N/A	no	no	no
22	30	F	Can En	Sp, Fr, Ma	no	yes	no