Morphosyntactic Transfer from German and English into Dutch in Third Language Acquisition:

A Study on Dutch Superlatives and Two-Verb Clusters

Andreas Hiemstra

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by

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CHAPTER 1. INTRODUCTION

Multilingualism is by no means the exception but rather the norm, reflecting the linguistic reality of the majority of individuals worldwide. It represents the "natural state of human beings" (Chomsky, 2000, p. 59) throughout history and remains prevalent today. The term *multilingualism* is used in this dissertation to refer to the use of three or more languages (e.g., Hammarberg, 2010). In the globally connected world we live in, it is not uncommon to learn one or more foreign languages after one or more first languages. As a result, language learners often already have knowledge of several languages when they begin learning a new foreign language. For example, German-speaking learners of Dutch, and the same holds for many English-speaking learners of Dutch, usually have knowledge of both German and English as a first language (L1) and second language (L2), when they begin learning Dutch as a third language (L3). As a consequence, Dutch is typically learned as an L3 in the German and English language areas. German-speaking and English-speaking learners of Dutch are therefore multilingual language learners who not only have knowledge of an L1 but have also previously learned an L2 before learning Dutch as an L3. Furthermore, in these cases, the L1, L2 and L3—namely Dutch, German and English—all belong to the West Germanic language family. This means that L3 Dutch is learned after two typologically closely related languages have already been learned. In learning an L3, both the L1 and the L2 can positively or negatively influence the acquisition of the L3. This is referred to as transfer or cross-linguistic influence. Transfer can be defined as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). It is assumed that the extent to which the L3 is influenced by the L1 and/or the L2 depends on various different factors, such as overall typological proximity, psychotypological proximity, structural proximity, L2 status, L2 and/or L3 proficiency and construction frequency in the L3, just to name a few. Over the last two decades, a substantial amount of research has focused on the factors influencing transfer from the L1 and/or the L2 into the L3, especially in the domain of morphosyntax. This research has led to the development of different models of L3 morphosyntactic transfer, each predicting distinct transfer patterns in L3 acquisition. The question of which factor predominates in morphosyntactic

transfer into the L3, as well as which model of L3 morphosyntactic transfer best predicts morphosyntactic transfer in L3 acquisition, remains a subject of ongoing debate and exploration within the field.

1.1 Scope of the Dissertation

This dissertation contributes to the ongoing debate on morphosyntactic transfer into the L3 by offering novel insights into the intricate interplay between the L1, the L2, and the L3 in L3 acquisition. Specifically, we investigate the acquisition of L3 Dutch by German-speaking learners and English-speaking learners of Dutch. This sheds light on the factors influencing L3 morphosyntactic transfer between the closely related West Germanic languages Dutch, German, and English. Additionally, it explores models of L3 morphosyntactic transfer, which predict different transfer patterns in L3 acquisition.

1.1.1 Morphosyntactic Transfer in L3 Acquisition

Learning an L3 differs in many respects from learning an L2. The main difference between L3 acquisition and L2 acquisition lies in the respective level of complexity: In contrast to L2 acquisition, learners in L3 acquisition have already acquired a foreign language and thus have, for example, access to more than one linguistic system (Falk & Bardel, 2011; Aronin & Jessner, 2015). Consequently, L3 learners can use linguistic properties—meaning linguistic phenomena/structures such as phonological, lexical, and morphosyntactic structures—from both their L1 and L2 in their L3. Access to more grammar options, in turn, exponentially increases the possibilities of transfer when learning an L3 (Aronin & Jessner, 2015). When learning an L2, there are two possible directions of transfer (L1 → L2 and L1 ← L2), however, when learning an L3, there are six possible directions of transfer (L1 → L2, L1 → L3, L2 → L3, L1 ← L2, L1 ← L3 and L2 ← L3) (Jarvis & Pavlenko, 2008). Accordingly, L3 learners, unlike L2 learners, can not only fall back on their L1, but also their L2. Thus, they might show transfer, if any, from either their L1 or L2. In the case of German-speaking and English-speaking learners of L3 Dutch, this means that they can, in principle, refer back to both German and English while learning Dutch.

However, it is still debated which of the previous languages influences the L3 grammar more, and which factor predominates in morphosyntactic transfer into the

L3. In recent years, the literature has discussed four possibilities of L3 morphosyntactic transfer: (I) no transfer, (II) default L1 transfer, (III) default L2 transfer, and (IV) L1 and/or L2 transfer (Puig-Mayenco et al., 2020). While transfer models for scenarios (I) and (II) have yet to be formulated, data partially support possibility (II), that is, default L1 transfer (Puig-Mayenco et al., 2020). On the other hand, for possibilities (III) and (IV), different corresponding models of L3 morphosyntactic transfer have been formulated. This dissertation aims to test two such transfer models, which have received most attention in the literature so far: the L2 Status Factor Hypothesis (III), which argues for default L2 transfer (Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011), and the Typological Primacy Model (IV), which argues for either L1 or L2 transfer, depending on the overall typological proximity between the languages in question (Rothman, 2011, 2015).

1.1.2 Models of L3 Morphosyntactic Transfer

Models of L3 morphosyntactic transfer can be categorised into two groups. The first group includes models claiming that the order of acquisition is the determining factor in morphosyntactic transfer into the L3, namely, default L1 transfer (no formal model proposed) and the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011). Several studies support the notion of default L1 transfer, arguing that the L1 is the first language to be acquired and remains the dominant language in most sequential multilinguals, blocking access to the L2 (e.g., Lozano, 2003; Jin, 2009; Na Ranong & Leung, 2009; Hermas, 2010, 2014, 2015). However, there is ample evidence in the literature that the L1 is not the only source of morphosyntactic transfer into the L3, and there seems to be no substantial support for default L1 transfer (Puig-Mayenco et al., 2020). On the other hand, numerous studies argue for default L2 transfer and support the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), arguing that the L2 and L3 are learned in similar ways, however, the L1 is not, blocking access to the L1. Moreover, it is argued that while the L2 and L3 are stored in the declarative memory system, the L1 is stored in the procedural memory system, again, blocking access to the L1 (Ullman 2001, 2004, 2005; Paradis, 2004, 2009; Bardel & Falk, 2012). Evidence from the literature supports the L2 Status Factor Hypothesis (Puig-Mayenco et al., 2020), however, it has also been shown that the L2 is not the only source of L3 morphosyntactic transfer. Both default L1 transfer and the L2 Status Factor

Hypothesis are wholesale transfer models, that is, transfer of a substantial part or even the entirety of the linguistic properties of the L1 grammar or the L2 grammar as a block (Schwartz & Sprouse, 2021).

The second group of models of L3 morphosyntactic transfer includes models claiming that typological/structural proximity between languages is the determining factor in morphosyntactic transfer into the L3, namely, the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017). Linguistic proximity or distance refers to the relatedness or closeness of languages. Typological proximity refers to the general closeness of languages based on broad structural characteristics, while structural proximity refers to the closeness of specific grammatical properties across languages. The Cumulative Enhancement Model proposes that both the L1 and L2 are equally available for transfer in L3 acquisition, and that language learning is cumulative. Moreover, the L1 and the L2 enhance L3 acquisition, that is, negative transfer does not exist in this model. Nevertheless, there is ample evidence in the literature supporting negative transfer. (Puig-Mayenco et al., 2020). The Typological Primacy Model proposes that either the L1 or the L2, but not both, are available for transfer in L3 acquisition, based on typological proximity determined by the internal linguistic parser using hierarchical linguistic cues "after minimally sufficient exposure to the L3" (Rothman, 2015, p. 179). Before that, both the L1 and the L2 are accessible for L3 morphosyntactic transfer (Rothman, 2015). In more recent papers, Rothman (2013, 2015) argues that transfer is subconsciously determined by the linguistic parser rather than by the learner's conscious perception of typological proximity. In the initial version of the Typological Primacy Model, however, Rothman (2011) argues that the selection of either the L1 or the L2 as transfer source depends on the typological proximity or even psychotypological proximity between the L1, L2 and L3. Psychotypology can be defined as "a learner's perception of relative similarity between any two languages, which might or might not coincide with actual typology" (Rothman & Cabrelli Amaro, 2010, p. 214). Although not always the case, in many instances subjective linguistic proximity (psychotypological proximity) and objective linguistic proximity (typological proximity) are the same (Rothman, 2011). There is considerable evidence in favour of the Typological Primacy Model in the literature (Puig-Mayenco et al., 2020). The Linguistic Proximity Model and the Scalpel Model propose that both the L1 and the L2 are equally available for transfer

in L3 acquisition, arguing that different languages of a multilingual are not separate and stay active even when not used. Moreover, in L3 acquisition, the corresponding linguistic properties of both the L1 and the L2 are activated, and compete with each other for structural proximity, and the linguistic property with the higher degree of activation is transferred into the L3. In addition, the Scalpel Model proposes that next to structural proximity, a number of additional factors such as construction frequency in the L3, and language activation and use play a role in morphosyntactic transfer into the L3. While the Typological Primacy Model is a wholesale transfer model, that is, transfer of one grammar (L1 or L2) as a block (see above), the Cumulative Enhancement Model, the Linguistic Proximity Model, and the Scalpel Model are piecemeal transfer models, that is, transfer of individual linguistic properties in a property-by-property fashion (Schwartz & Sprouse, 2021).

In general, the L2 Status Factor Hypothesis and the Typological Primacy Model have received the most attention in the literature so far, and most evidence is in favour of these two models of L3 morphosyntactic transfer (Puig-Mayenco et al., 2020). It is worth noting, however, that the Linguistic Proximity Model and the Scalpel Model, while also promising with regard to morphosyntactic transfer in L3 acquisition, are by comparison more recent and have not been tested as extensively. Further research could provide more evidence for these two transfer models if they were to be systematically tested.

1.1.3 Dutch, German and English

Dutch, German and English are closely related West Germanic languages and share a large number of similarities. German is generally closer to Dutch than English is to Dutch, especially in lexical terms (Van Haeringen, 1956; Gooskens & Heeringa, 2004; Heeringa et al., 2013). Nevertheless, not only geographically but also linguistically, Dutch occupies a middle position between its larger West Germanic neighbours, English and German. This language situation, that is, Dutch being in between English and German, is referred to as the *Germanic Sandwich* (e.g., van der Wouden, 2012). Dutch shows some linguistic properties that have two optional variants each in Dutch, where German and English instead only allow for one, and not the other. Two of those linguistic properties are superlatives (**1**) and two-verb clusters (**2**):

1. Superlatives:

a.	de	natuurlijk.ADJ-st.AFIX-e.NM	appel (DUT)
	der	natürlich.ADJ-st.AFIX-e.NM	Apfel (GER)
b.	de	meest.INTENS natuurlijk.ADJ-e.NM	appel (DUT)
	the	most.INTENS natural.ADJ	apple (ENG)

2. Two-verb clusters:

a.	dat	de	student	gedroomd.PART	heeft.AUX (DUT)
	dass	der	Student	getanzt.PART	hat.AUX (GER)
b.	dat	de	student	heeft.AUX	gedroomd.PART (DUT)
	that	the	student	has.AUX	danced.PART (ENG)

Dutch superlatives and two-verb clusters provide an excellent testing ground for investigating morphosyntactic transfer between L1 German/English, L2 English/German and L3 Dutch. The L1 and the L2, that is, German and English, respectively, exhibit different realisations for the linguistic properties under investigation, as we can see in (1.a) and (1.b), and in (**2.a**) and (**2.b**), which is a prerequisite for observing differential transfer effects in the analysed language pairs (Rothman, 2011). These linguistic properties facilitate testing the L2 Status Factor Hypothesis and the Typological Primacy Model against each other. Furthermore, the grammaticality of both the German and English variants in Dutch allows observations of transfer patterns from the L1 and/or the L2 into the L3. If either the L1 or the L2 exhibits a realisation for the linguistic properties under investigation that is ungrammatical in L3 Dutch, rejection or absence of such a realisation in learners of L3 Dutch does not necessarily provide any information about morphosyntactic transfer into the L3. It might also indicate that learners of L3 Dutch have acquired the knowledge that this realisation is ungrammatical in Dutch.

1.2 Aim of the Dissertation

This dissertation investigates morphosyntactic transfer in L3 acquisition between the closely related West Germanic languages Dutch, German, and English in learners of L3 Dutch with L1 German and L2 English as well as in learners of L3 Dutch with L1 English and L2 German. As recommended in the literature (e.g.,

Puig-Mayenco et al., 2020), we will use a mirror-image methodology. This approach allows us to test between the L2 Status Factor Hypothesis and the Typological Primacy Model with two mirror-image learner groups, "for whom the L3 is shared and the L1 and L2 are the same languages but in reversed order of acquisition" (Puig-Mayenco et al., 2020, p. 42):

- L1 German → L2 English → L3 Dutch
- L1 English → L2 German → L3 Dutch

The main focus lies in testing the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) against the Typological Primacy Model (Rothman, 2011, 2015) in a trilingual context. Thus, we aim to address the following overarching research question:

(RQ) Which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition?

Next to the overarching research question, we aim to address four sub-questions. In the initial version of the Typological Primacy Model, Rothman (2011) argues that although not always the case, in many instances typological proximity and psychotypological proximity are the same (see above). Given that Dutch—although occupying a middle position between English and German—is generally closer to German than to English, the analysed language pairs allow us to test whether typological proximity and psychotypological proximity indeed coincide, addressing the following sub-question:

(SQ.1) What perception do German-speaking and English-speaking learners of L3 Dutch have of the typological proximity between Dutch, German and English?

Furthermore, using two linguistic properties—namely superlatives and two-verb clusters—to investigate morphosyntactic transfer between L1 German/English, L2 English/German and L3 Dutch, allows us to investigate

whether morphosyntactic transfer into the L3 indeed occurs as a block (wholesale transfer) or rather in a property-by-property fashion (piecemeal transfer), addressing the following sub-question:

(SQ.2) To what extent (wholesale vs. piecemeal) are different linguistic properties (superlatives and two-verb clusters) affected in morphosyntactic transfer into the L3?

Moreover, as recommended in the literature (Puig-Mayenco et al., 2020), we use both processing and comprehension (self-paced reading task and grammaticality judgement task) as well as production (sentence completion task) methods to investigate morphosyntactic transfer between L1 German/English, L2 English/German and L3 Dutch, addressing the following sub-question:

(SQ.3) What differences emerge in morphosyntactic transfer into the L3 in language processing and comprehension, and language production?

Finally, we investigate the factor *language proficiency* in the L3 and the L2 in morphosyntactic transfer into the L3. Proficiency is not included in the models of L3 morphosyntactic transfer. However, it has long been argued that proficiency in both the L3 and the L2 influences the source and amount of transfer into the L3. With regard to L3 proficiency, there is a consensus in the literature that transfer into the L3 in general is more likely to occur at lower levels of L3 proficiency. With regard to L2 proficiency, it is generally believed that transfer from the L2 into the L3 occurs more often at the initial stages of L3 acquisition. However, there are opposing views in terms of the effects of different levels of L2 proficiency in morphosyntactic transfer into the L3. On the one hand, it is argued that transfer from the L2 into the L3 seems to be more likely with higher L2 proficiency, and, on the other hand, it has also been shown that transfer from the L2 into the L3 occurs even when L2 proficiency is low or intermediate. Within this debate, empirical evidence is still scarce (De Angelis, 2007; Sánchez & Bardel, 2017; Eibensteiner, 2023; see also Bardel & Sánchez, 2020), which is why we address the following sub-question:

(SQ.4) To what extent is morphosyntactic transfer into the L3 influenced by language proficiency in the L3 and the L2?

1.3 Overview of the Dissertation

We will start with a theoretical background on the topic of morphosyntactic transfer in L3 acquisition (Chapter 2), before providing an overview of the linguistic properties used to investigate morphosyntactic transfer into the L3 (Chapter 3). Then, three studies investigating different aspects of morphosyntactic transfer in L3 acquisition (Chapters 4 – 6) follow. A general discussion on the findings of this dissertation (Chapter 7) concludes the work.

The theoretical background in Chapter 2 lays the theoretical basis for this dissertation. Firstly, it provides general information on morphosyntactic transfer in L3 acquisition by discussing L3 acquisition and transfer in L3 acquisition in comparison to L2 acquisition and transfer in L2 acquisition. Secondly, it provides a discussion on the models of L3 morphosyntactic transfer, namely, default L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017). Finally, it illustrates the international status of Dutch as a foreign language and the distribution of Dutch as a foreign language in the German and English language areas, and it provides an overview of the similarities and differences between Dutch, German and English, both in typological (i.e., objective proximity) as well as in psychotypological (i.e., subjective proximity) terms. Chapter 3 discusses the linguistic properties (superlatives and two-verb clusters) used to investigate morphosyntactic transfer between Dutch, German and English. Moreover, this chapter includes a description of the item selection process and illustrates how the twelve superlative and two-verb cluster test items for the experimental tasks are created based on the *Groningen Twitter Corpus* (Bouma, 2015). Chapter 4 includes a study on the perception of the typological proximity between Dutch, German and English (i.e., psychotypological proximity) of German-speaking learners of L3 Dutch with L2 English, English-speaking learners of L3 Dutch with L2 German, as well as L1 speakers of Dutch. Chapter 5 includes a study on morphosyntactic transfer into the L3 in German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German, in language processing and comprehension, using a self-paced reading task and a grammaticality judgement task. Chapter 6 includes a study on morphosyntactic transfer into the L3 in the same groups of learners of L3

Dutch in language production, using a sentence completion task. Chapter 7 includes a general discussion and conclusion, discussing the overall results of this dissertation, and formulating methodological implications for future research, and pedagogical implications based on the findings of this dissertation.

CHAPTER 2. THEORETICAL BACKGROUND

In this chapter, we provide general information on morphosyntactic transfer in L3 acquisition by discussing L3 acquisition and transfer in L3 acquisition in comparison to L2 acquisition and transfer in L2 acquisition (see **2.1 Morphosyntactic Transfer in L3 Acquisition**). Secondly, we provide a discussion on the models of L3 morphosyntactic transfer, namely, default L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017) (see **2.2 Models of L3 Morphosyntactic Transfer**). Finally, we illustrate the international status of Dutch as a foreign language and the distribution of Dutch as a foreign language in the German and English language areas. Moreover, we provide an overview of the similarities and differences between Dutch, German and English, both in typological as well as in psychotypological terms (see **2.3 Dutch, German and English**).

2.1 Morphosyntactic Transfer in L3 Acquisition

Language learners often have knowledge of more than one language when they begin learning a new language. For example, German-speaking and English-speaking learners of Dutch often have knowledge of both German and English as an L1 and an L2, respectively, when they begin learning Dutch. In the German language area, Dutch is typically learned as an L3 in secondary school education and university education after English as compulsory L2 (Nederlandse Taalunie, 2020). In the English language area, learners of L3 Dutch usually also already have knowledge of L2 German. Here, Dutch courses are often part of German or Germanic Studies departments, so students are often only introduced to Dutch after learning German (Association for Low Country Studies [ALCS], 2006; Vismans & Wenzel, 2012; Verheyen & Collet, 2019). Thus, Dutch is typically learned as an L3 after German and English in the German and English language areas. As a

consequence, both German and English, that is, the L1 and L2, have the potential to positively or negatively influence the acquisition of L3 Dutch[1].

2.1.1 L3 Acquisition

While some define L3 as "a non-native language which is currently being used or acquired in a situation where the person already has knowledge of one or more L2s in addition to one or more L1s" (Hammarberg, 2010, p. 97), others define L3 as all foreign languages acquired after one or more L1s and only one L2, and thereby acknowledging "the difference between acquiring an L2 for the first time and the subsequent acquisition of further languages" (Hammarberg, 2010, p. 95). In this case, the L2 is also referred to as a *true L2* in the literature (e.g., Falk & Bardel, 2011). See, for example Hammarberg (2010) and Bardel and Falk (2021) for a discussion on the terms *L1*, *L2* and *L3*. Next to the term *L3*, the term *Ln* is also commonly used in the literature on the acquisition of new languages by learners who have already acquired at least two other languages (Schwartz & Sprouse, 2021). We confine ourselves to the term *L3* and adopt the latter definition of L3. The L3 is a language learned after the L1 and the true L2, that is, the first foreign language being learned (i.e., consecutive acquisition of L1, L2 and L3 (Jessner, 2008)). As a consequence, in this dissertation, we do not consider learners of an L3 with two L1s, that is, simultaneous bilinguals acquiring an L3 as their first foreign language (Jessner, 2008). This seems reasonable, since learning an L3 differs from learning an L2, and an L1, in many ways. The main difference between L3 acquisition and L2 acquisition lies in the respective level of complexity (e.g., Hufeisen, 2010; Aronin & Jessner, 2015). L3 learners, unlike L2 learners, have, for example, seven language modes (three *monolingual modes*: L1, L2, L3; three *bilingual modes*: L1-L2, L1-L3, L2-L3; one *trilingual mode*: L1-L2-L3) instead of three language modes (two *monolingual modes*: L1, L2; one *bilingual mode*: L1-L2) at their disposal (Grosjean, 2001, 2010). In addition, L3 learners, unlike L2 learners, can make use of a greater number of (language) learning strategies acquired during the acquisition of the L2 (Kemp, 2007). It is argued that L3 learners have developed cognitive skills based on the learning experience during the acquisition of the L2 that L2 learners do not (yet) possess (Bardel & Falk, 2012).

[1] Learners of L3 Dutch in the German and English language areas might have learned additional foreign languages such as French or Spanish. For these language learners, Dutch is not necessarily the third language learned.

Therefore, L3 learners are also considered "experienced language learners" (Cenoz, 2003, p. 72). Moreover, in contrast to L2 learners, L3 learners have access to more than one linguistic system (Falk & Bardel, 2011; Aronin & Jessner, 2015). Consequently, L3 learners can use linguistic properties (e.g., phonology, lexicon and morphosyntax) from both their L1 and L2 in their L3. Access to more grammar options, in turn, exponentially increases the possibilities of transfer[2] when learning an L3 (Aronin & Jessner, 2015). Transfer is recognised within the framework of holistic models for multilingual learning as a central aspect of acquiring an L3 (see, e.g., *Dynamic Model of Multilingualism* (Herdina & Jessner, 2002), *Plurilingual Processing Model* (Meißner, 2004), *Faktorenmodell* (Hufeisen, 2010, 2020), and also *Holistic Model for Multilingualism in Education* (Duarte & Günther-van der Meij, 2018)), and can be defined as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). Positive transfer is the result of similarities between languages when assumed similarities align with objective language similarities; on the other hand, negative transfer is the result of differences between languages when assumed similarities conflict with objective language differences (Jarvis & Pavlenko, 2008, but see, e.g., Ballinger et al., 2020). When learning an L2, there are two possible directions of transfer:

- L1 → L2 (*forward transfer*)
- L1 ← L2 (*reverse transfer*)

However, when learning an L3, there are six possible directions of transfer:

- L1 → L2 and L1 → L3 (*forward transfer*)
- L1 ← L2 and L1 ← L3 (*reverse transfer*)
- L2 → L3 and L2 ← L3 (*lateral transfer*)

[2] The terms *transfer* and *cross-linguistic influence (CLI)* (Sharwood Smith & Kellerman, 1986) are often used interchangeably in the literature on L2 and L3 acquisition studies (Jarvis & Pavlenko, 2008). See, for example, Jarvis (2017) and González Alonso and Rothman (2017) for a discussion of these terms. In L3 acquisition studies, the term *multilingual transfer* (Rothman, 2015) is also used. We use the term *transfer* throughout this dissertation, as is common in most of the literature on L3 morphosyntactic transfer, to refer to the influence from the L1 and the L2 on the L3 as defined by Odlin (1989).

Accordingly, L3 learners, unlike L2 learners, can not only fall back on their L1 (L1 → L3, *forward transfer*), but also their L2 (L2 → L3, *lateral transfer*). For a discussion of the terms *forward transfer*, *reverse transfer*, and *lateral transfer*, see Jarvis and Pavlenko (2008). Thus, L3 learners might show transfer, if any, from either their L1 or L2. In the case of German-speaking and English-speaking learners of L3 Dutch, this implies that they can, in principle, refer back to both German and English while learning Dutch.

There are different types of transfer: phonological, orthographical, lexical, semantic, morphological, syntactic, discursive, pragmatic and sociolinguistic transfer (Jarvis & Pavlenko, 2008). Phonological, orthographical, lexical, and semantic transfer have been researched for decades, while morphological and syntactic transfer have received more interest since around 1990, and discursive, pragmatic, and sociolinguistic transfer only began receiving greater attention since the turn of the century (Jarvis & Pavlenko, 2008). The present dissertation investigates factors in morphosyntactic transfer in L3 acquisition. Morphology and syntax have long been considered to be immune to transfer (e.g., Odlin, 1989; Håkansson et al., 2002; De Angelis, 2007). However, many instances of morphological and syntactic transfer have been observed in recent studies (Jarvis & Pavlenko, 2008). Studying morphosyntactic transfer reveals how learners apply grammatical properties from their L1 and L2 to acquire their L3. Moreover, morphosyntactic transfer might unveil UG influences and developmental patterns in L3 acquisition, and pedagogical implications for L3 acquisition, offering insights into cognitive processes. By investigating morphosyntactic transfer in L3 acquisition, we gain a deeper understanding of L3 acquisition stages and can inform more effective L3 teaching methodologies.

However, it is still debated which of the previous languages influences the L3 grammar more; which transfer factors determine morphosyntactic transfer into the L3; which transfer factor might take precedence over others in L3 acquisition; and whether morphosyntactic transfer in L3 acquisition proceeds as a block (wholesale transfer) or property-by-property (piecemeal transfer). In the literature, four possibilities of morphosyntactic transfer into the L3 are discussed: (I) no transfer, (II) default L1 transfer, (III) default L2 transfer, and (IV) L1 and/or L2 transfer (Puig-Mayenco et al., 2020). For possibilities (I) and (II), transfer models have yet to be formulated, however, data partially support possibility (II), that is, default L1 transfer (Puig-Mayenco et al., 2020). Conversely, for possibilities (III) and (IV), different corresponding transfer models have been formulated: The L2 Status

Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) for possibility (III), and the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017) for possibility (IV). This dissertation aims to test two such transfer models: the L2 Status Factor Hypothesis (III), which argues for default L2 transfer (Bardel & Falk, 2007; Falk & Bardel, 2011), and the Typological Primacy Model (IV), which argues for L1 or L2 transfer, depending on the typological proximity between the L1, L2 and L3 (Rothman, 2011, 2015). Different transfer models are discussed in detail below (see **2.2 Models of L3 Morphosyntactic Transfer**).

2.1.2 Transfer in L3 Acquisition

At the end of the 20th century within UG theory, different hypotheses have been proposed about the nature of the initial state of language acquisition. In L1 acquisition, Universal Grammar (UG) is the initial state (Chomsky, 1981), and in L2 acquisition, either UG or the L1 is the initial state (White, 2003). If this logic is transferred to L3 acquisition, either UG or the L1/L2 is the initial stage.

Initial state proposals arguing that UG is the initial state in L2 acquisition are the Initial Hypothesis of Syntax (Platzack, 1996) and the Full Access (without Transfer) Hypothesis (Epstein et al., 1996). The former explicitly claims that the initial state in L2 acquisition is UG and not L1 grammar, while the latter claims this implicitly (White, 2003). See White (2003) for a comprehensive discussion of these hypotheses. White (2003) summarises the Initial Hypothesis of Syntax (Platzack, 1996) and the Full Access (without Transfer) Hypothesis (Epstein et al., 1996) as follows: (a) UG is the L2 initial state and not L1 grammar, (b) L2 development is UG-constrained (response to L2 input), and (c) the final outcome (i.e., L2 competence) is identical to that of L1 speakers. These hypotheses, thus, reject the possibility of transfer of L1 properties in the L2 initial state. However, according to Rothman et al. (2019) no studies have adopted the claim that there is no transfer from previously acquired languages. They further argue that there is ample evidence from L2 acquisition research demonstrating transfer from the L1 into the L2 and that it is reasonable to assume that this will also apply to L3 acquisition (Rothman et al., 2019). Moreover, there is overwhelming support for transfer from L3 acquisition research and, according to González Alonso and Rothman (2017),

"it seems difficult to deny the involvement of transfer in … [L2], … [L3] or subsequent language acquisition" (p. 280).

In contrast, initial state proposals arguing that the L1, in part or in whole, is indeed the initial state in L2 acquisition are the Minimal Trees Hypothesis (Vainikka & Young-Scholten, 1996), the Valueless Features Hypothesis (Eubank, 1993/1994) and the Full Transfer/Full Access Model (Schwartz & Sprouse, 1996). See White (2003) for a comprehensive discussion of these hypotheses. The Minimal Trees Hypothesis (Vainikka & Young-Scholten, 1996) and the Valueless Features Hypothesis (Eubank, 1993/1994) assume partial transfer from the L1 into the L2. White (2003) summarises these approaches as follows: (a) L1 grammar, in part, is the initial state (Minimal Trees Hypothesis: transfer of lexical categories, no transfer of functional categories; Valueless Features Hypothesis: transfer of lexical categories, functional categories and inert features), (b) L2 development is UG-constrained (response to L2 input), and (c) the final outcome (i.e., L2 competence) is a convergence to L2 grammar. The Full Transfer/Full Access Model (Schwartz & Sprouse, 1996), on the other hand, assumes full transfer from the L1 into the L2. According to White (2003), full transfer concerns the initial state of language acquisition, whereas full access concerns the UG constrained reconstruction of grammar in response to target language input in the course of language acquisition. White (2003) summarises this approach as follows: (a) L1 grammar in its entirety (copy or clone) is the initial state, (b) L2 development is UG-constrained (response to L2 input), and (c) the final outcome (i.e., L2 competence) is a convergence to L2 grammar, although not guaranteed. According to Rothman et al. (2019) a significant number of L2 acquisition studies have clearly shown the presence of full L1 transfer as opposed to partial L1 transfer. They further argue that it is reasonable to state that this is the majority opinion in the field of L2 acquisition (Rothman et al., 2019). In L3 acquisition, full transfer is also assumed, as hypothesised by the Full Transfer/Full Access Model (Leung, 2003, 2006; Rothman et al., 2019). Current models of L3 morphosyntactic transfer, which we discuss below (see **2.2 Models of L3 Morphosyntactic Transfer**),

> also eliminate *a priori* proposals of inaccessibility or partial access to UG, showing instead that new L2 morphosyntactic properties are acquired by successful L2ers insofar as they are available for initial state transfer in L3/Ln acquisition. As such, all existing L3 models … can be viewed as corollaries at some level to the Full Transfer/Full Access initial state model

> for L2 acquisition (Schwartz & Sprouse 1996). (García Mayo & Rothman, 2012, pp. 15-16, emphasis by the authors)[3]

Current models of L3 morphosyntactic transfer can therefore be seen as assuming that (a) the entirety of L1/L2 grammar is the initial state of L3 acquisition, (b) L3 development is UG-constrained (response to L3 input), and (c) the final outcome (i.e., L3 competence) is a convergence to L3 grammar, although not guaranteed. Hence, the initial state of L3 acquisition is the entire L1/L2 grammar, however, L3 input can reconstruct the corresponding grammar in the course of L3 acquisition due to UG-accessibility. Thus, current models of L3 morphosyntactic transfer assume that language learners have access to UG during L3 acquisition.

Although agreeing on full transfer, meaning that the entirety of the L1/L2 grammar is the initial state of L3 acquisition (see above), current models of L3 morphosyntactic transfer differ in terms of how full transfer takes place, and can be categorised into wholesale transfer models and piecemeal transfer models (Schwartz & Sprouse, 2021). Wholesale transfer can be defined as "transfer of a substantial part of or even all of the abstract properties of one of the previously acquired grammars as a block" (Schwartz & Sprouse, 2021, p. 2), resulting in both positive and negative transfer (Rothman, 2015). Piecemeal transfer, on the other hand, can be defined as transfer proceeding "in a property-by-property fashion, i.e., one property at time, most typically when … [L3 learners] in some sense perceive a match between a property in the L3 input and a property in one of the previously acquired languages" (Schwartz & Sprouse, 2021, p. 4). Wholesale transfer models are default L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis and the Typological Primacy Model, and piecemeal transfer models are the Cumulative Enhancement Model, the Linguistic Proximity Model, and the Scalpel Model. See Schwartz & Sprouse (2021) for a discussion on wholesale vs. piecemeal transfer models.

2.1.3 Conclusion

In conclusion, this suggests that transfer is present in L3 acquisition, just as it is in L2 acquisition, but also that transfer is complete in the sense of a full transfer, either

[3] Note that the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b) and the Scalpel Model (Slabakova, 2017) were not yet proposed when García Mayo and Rothman made this claim in 2012.

as a block (wholesale transfer) or property-by-property (piecemeal transfer). The question remains as to how morphosyntactic transfer into the L3 proceeds (wholesale transfer vs. piecemeal transfer), which language, the L1, the L2, or both, is the source of morphosyntactic transfer into the L3, and which transfer factors determine morphosyntactic transfer in L3 acquisition. The models of L3 morphosyntactic transfer discussed below each aim to provide answers to these questions.

2.2 Models of L3 Morphosyntactic Transfer

Although both morphology and syntax have long been considered immune to transfer (e.g., Odlin, 1989; Håkansson et al., 2002, De Angelis, 2007), recent studies have been able to provide numerous examples of morphosyntactic transfer. See Jarvis and Pavlenko (2008) for a discussion on morphological and syntactic transfer. Morphosyntactic transfer in L3 acquisition and the factors involved have been studied extensively over the last two decades, and different factors such as typological proximity, L2 status and proficiency in the L2 and the L3 have been shown to influence transfer (e.g., Williams and Hammarberg 1998; De Angelis, 2007), however, scientific consensus about the strength of the influence of the L1 and/or the L2, and the strength of different factors on morphosyntactic transfer in L3 acquisition is still lacking, and research results seem to contradict each other. In this chapter, we discuss the four possibilities of morphosyntactic transfer into the L3 in more detail: (I) no transfer, (II) default L1 transfer, (III) default L2 transfer, (IV) L1 and/or L2 transfer. In doing so, we also discuss corresponding models of L3 morphosyntactic transfer: default L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis (Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011), the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017). For the sake of completeness, it should be noted that more recent studies claim that the dominant language of communication (L1 or L2) might be the main source of morphosyntactic transfer into the L3 at the initial state of L3 acquisition (Fallah et al., 2016; Fallah & Jabbari, 2018; Jabbari et al., 2018). Since no formal model has yet been proposed for the factor *dominant language of communication*, in this dissertation, we consider this factor as part of

the additional factors that play a role in morphosyntactic transfer according to Slabakova (2017) (see **2.2.6 Scalpel Model**).

2.2.1 Default L1 Transfer

Several studies (e.g., Lozano, 2003; Jin, 2009; Na Ranong & Leung, 2009; Hermas, 2010, 2014, 2015) argue that the L1 is the default/only source of morphosyntactic transfer into the L3. Thus, German-speaking learners of L3 Dutch with L2 English would show exclusive transfer from L1 German into L3 Dutch, and English-speaking learners of L3 Dutch with L2 German would show exclusive transfer from L1 English into L3 Dutch. However, no transfer model arguing for default L1 transfer has yet been formally proposed for L3 acquisition within the generative paradigm (García Mayo & Rothman, 2012; Puig-Mayenco et al., 2020) and the mechanisms determining that there should be L1 transfer only have not yet been explained in detail (Rothman et al., 2019). It is, however, argued that the default status of the L1 is due to its cognitive status: The L1 is the first language to be acquired and remains the dominant language in most sequential multilinguals, and it is assumed that the L1 is therefore also dominant with regard to transfer accessibility (Lloyd-Smith et al., 2017; Rothman et al., 2019). García Mayo and Rothman (2012) argue that absolute L1 transfer would suggest that the L1 acts as a filter, blocking access to the L2, making the L1 the only source of transfer in L3 acquisition.

Rothman et al. (2019) argue that most, if not all, of the data supporting an exclusive role of the L1 in morphosyntactic transfer into the L3 could also be explained by other factors and/or models of L3 morphosyntactic transfer not considered/proposed at the time. For example, in Na Ranong and Leung (2009), the data of Thai-speaking learners of L3 Chinese with L2 English can equally well be explained by the Typological Primacy Model, since participant's L1 Thai and L3 Chinese are typologically related. Furthermore, there is ample evidence in the literature that the L1 is not the only source of morphosyntactic transfer into the L3. A meta-analysis by Puig-Mayenco et al. (2020) shows that only 14.1% of the studies included (10 out of 71) show exclusive L1 transfer. None of these studies controlled for mirror-image groups, and a significant association is found between L1 transfer and studies not using a mirror-image methodology (10 vs. 0; $p = .01$). In addition, four out of the 10 studies showing exclusive L1 transfer can also be explained by the factor *typological proximity*. According to Puig-Mayenco et al.

(2020), the remaining 8.5% of the studies included (6 out of 71) showing L1 transfer might simply represent noise in the data. Hence, there is substantial evidence against default L1 transfer.

2.2.2 L2 Status Factor Hypothesis

A number of studies (e.g., Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011; Bardel & Sánchez, 2017) argue that the L2 is the default/only source of morphosyntactic transfer into the L3. Thus, German-speaking learners of L3 Dutch with L2 English would show exclusive transfer from L2 English into L3 Dutch, and English-speaking learners of L3 Dutch with L2 German would show exclusive transfer from L2 German into L3 Dutch. The dominant role of the L2 in L3 acquisition was already introduced by Meisel (1983) as the so-called *foreign language effect* and later labelled *L2 status factor* by Williams and Hammarberg (1998). Hammarberg (2001) defines the L2 status factor as "a desire to suppress [the] L1 as being 'non-foreign' and to rely rather on an orientation towards a prior L2 as a strategy to approach the L3" (p. 37, emphasis by the author). Following this work, the L2 Status Factor Hypothesis was proposed (Bardel & Falk, 2007). Bardel and Falk (2007) found that the L2 is the source of transfer into the L3 with regard to negation placement in L3 learners of a V2-language (Swedish/Dutch) with a V2-L1 (Dutch/Swedish) and a non-V2-L2 (English). They argue that the typological proximity between the L1 and L3 is not sufficient to cause L1 transfer and, thus, the L2 status factor is stronger than the factor *typological proximity*, even if the L2 leads to negative transfer (Bardel & Falk, 2007). In a later study, Falk and Bardel (2011) found further evidence for the L2 Status Factor Hypothesis: The L2 is the source of transfer into the L3 with regard to the placement of object pronouns in L3 learners of German (pre-verbal in subordinate clauses/post-verbal in main clauses) with either L1 French (pre-verbal in subordinate and main clauses) and L2 English (post-verbal in subordinate and main clauses) or L1 English (post-verbal in subordinate and main clauses) and L2 French (pre-verbal in subordinate and main clauses).

The main argument in support of the L2 Status Factor Hypothesis is the difference between L1 acquisition and foreign language acquisition (Hammarberg, 2001; Falk & Bardel, 2010, 2011). Differences lie in age of onset, outcome, learning situation (natural/informal vs. classroom/formal), degree of metalinguistic knowledge, learning strategies present in L2 acquisition but not in L1 acquisition,

and degree of awareness of the language learning process (Falk & Bardel, 2010). These sociolinguistic and cognitive differences cause transfer from the L1 to be blocked even when the L1 and the L3 are typologically closely related and share linguistic properties, whereas the higher degree of similarity in the acquisition of foreign languages causes a co-activation of the L2 and the L3 (Falk & Bardel, 2011).

Bardel and Falk (2012) also draw on the Declarative/Procedural Model (Ullman 2001, 2004, 2005; Paradis, 2004, 2009) to underpin the L2 Status Factor Hypothesis. Paradis (2009) claims that while L1 grammar is stored in the procedural memory system as implicit linguistic competence, foreign language grammars are stored in the declarative memory system as explicit metalinguistic knowledge. Building on this claim, Bardel and Falk (2012) argue that the L2 and the L3 are cognitively more similar than the L1 and the L3, which is why the L2 influences the L3 more strongly. However, in a subsequent study, Falk et al. (2015) found that the L1 might in fact influence the L3 more strongly than the L2 if learners have developed explicit metalinguistic knowledge about their L1. If L3 learners have a high level of explicit metalinguistic knowledge in their L1, the L1 is the dominant source of transfer into the L3 with regard to adjective placement in L3 learners of Dutch (pre-nominal placement) with L1 Swedish (pre-nominal placement) and a Romance L2 (post-nominal placement) (Falk et al., 2015). In L3 learners of Dutch with low levels of metalinguistic knowledge in their L1 Swedish, the L2 is the dominant source of transfer into the L3 (Falk et al., 2015). Falk et al. (2015) therefore argue that explicit metalinguistic knowledge forms the basis of the L2 Status Factor Hypothesis. Therefore, assuming that L3 learners can develop metalinguistic knowledge also in their L1, "in additional language learning, all previous language learning matters" (Bardel, 2019, p. 199). In a more recent discussion of the L2 Status Factor Hypothesis, Bardel and Sánchez (2017) argue that explicit metalinguistic knowledge is the key factor in transfer, and that the selection of the L1 or L2 as transfer source in L3 learning also depends on individual differences with regard to working memory, attention and noticing. They argue further that negative transfer is a result of shortcomings in cognitive capacities, rather than incorrect transfer source selection (Bardel & Sánchez, 2017). In this context, Puig-Mayenco et al. (2020) note that the erosion of the binary distinction between implicit L1 competence and explicit L2 knowledge makes it difficult to make clear predictions based on the L2 Status Factor Hypothesis. The meta-analysis by Puig-Mayenco et al. (2020) shows that 28.2% of the studies

included (20 out of 71) show exclusive L2 transfer. Only one of these studies controlled for mirror-image groups, and a significant association is found between L2 transfer and studies not using a mirror-image methodology (19 vs. 1; $p = .01$). In addition, a significant association is found between L2 transfer and L3 production studies (12 vs. 8, $p = .02$), thus, production experiments seem to correlate with observing L2 transfer. Sixteen out of the 20 studies showing exclusive L2 transfer can just as well be explained by the factor *typological proximity*, leaving only 5.6% of the studies included (4 out of 71) showing clear L2 transfer and, hence, supporting the L2 Status Factor Hypothesis (Puig-Mayenco et al., 2020).

2.2.3 Cumulative Enhancement Model

The Cumulative Enhancement Model (Flynn et al. 2004; Berkes & Flynn, 2012), in contrast to default L1 transfer and the L2 Status Factor Hypotheses, proposes that all previously learned languages are equally available for transfer in subsequent language learning, and, therefore, both the L1 and L2 serve as sources of transfer into the L3. Note that this model was proposed before the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011). According to Rothman et al. (2019), the Cumulative Enhancement Model, that is, "the first truly bespoke model of L3 … morphosyntactic development" (p. 134), has inspired not only the L2 Status Factor Hypothesis, but all competing models of today. If the Cumulative Enhancement Model best predicts morphosyntactic transfer in L3 acquisition, German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German would show transfer from both L1 German or English, respectively, and L2 English or German, respectively, into the L3. In earlier studies on the acquisition of restrictive relative clauses, Flynn (1983, 1987) found L1 transfer into L2 English (head-initial, right branching) in L2 learners of English with L1 Spanish (head-initial, right branching), but not in L2 learners of English with L1 Japanese (head-final, left branching). Examining whether or not the L1 has a privileged role in subsequent language learning, Flynn et al. (2004) found that the L2 is the dominant source of transfer into the L3 with regard to the acquisition of restrictive relative clauses in L3 learners of English (head-initial, right branching) with L1 Kazakh (head-final, left branching) and L2 Russian (head-initial, right branching). Based on these results, Flynn et al. (2004) argue that the L1 is indeed not the sole source for transfer into the L3, but that all previously

learned languages can influence L3 acquisition, and that language learning is not redundant but cumulative. They argue further that both the L1 and the L2 can either enhance L3 acquisition or remain neutral, that is, L1 and L2 transfer into the L3 only occurs when it has a facilitative effect on L3 acquisition (Flynn et al., 2004). The authors point out that "this claim contrasts with models that either implicitly or explicitly characterise subsequent language learning fundamentally in terms of a deficit model (e.g., negative transfer, and interference)" (Flynn et al., 2004, p. 5). Rothman et al. (2019) argue that these results could equally be explained by the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) and the Typological Primacy Model (Rothman, 2011) which, however, did not exist when the Cumulative Enhancement Model (Flynn et al. 2004) was proposed. Additionally, García Mayo and Rothman (2012) present a thoughtful critique, noting that the Cumulative Enhancement Model does not explain how positive transfer is motivated and negative transfer is blocked. They further state that "somewhat naively, the … [Cumulative Enhancement Model] seemingly predicts that … [negative] transfer would never be attested" (García Mayo and Rothman, 2012, p. 19). Nevertheless, there is ample evidence in the literature supporting the existence of negative transfer. The meta-analysis by Puig-Mayenco et al. (2020) shows that 92.5% of the studies included (62 out of 67) show evidence of negative transfer in L3 acquisition. Note that four studies out of the 71 studies included in the meta-analysis were excluded with regard to the macro-variable *non-facilitative transfer* (i.e., negative transfer) because positive transfer was tested in these studies (Puig-Mayenco et al., 2020). In the light of these results, Puig-Mayenco et al. (2020) encourage us to examine "if it is time to discard this theory from further consideration moving forward" (p. 51) and propose that "any adequate theory of morphosyntactic transfer in … [L3] acquisition must minimally be able to accommodate instances of … [negative] transfer from previously acquired languages" (p. 51). We are reluctant to suggest that the Cumulative Enhancement Model should be discarded in its entirety, but agree that it needs to be revised.

2.2.4 Typological Primacy Model

The Typological Primacy Model (Rothman, 2011, 2013, 2015) proposes that all previously learned languages are available for transfer in subsequent language learning. Therefore, both the L1 and L2 can theoretically serve as sources of transfer into the L3. The Typological Primacy Model aligns with the Cumulative

Enhancement Model, the Linguistic Proximity Model (see below), and the Scalpel Model (see below) on this particular aspect, but differs from default L1 transfer and the L2 Status Factor Hypothesis, that is, default L2 transfer. However, within the nondefault transfer models, the Typological Primacy Model "stands alone by stipulating that one or the other language, but crucially not both, is selected as the initial source of transfer in all domains of L3 morphosyntactic representation" (Rothman et al., 2019, p. 155). If the Typological Primacy Model best predicts morphosyntactic transfer in L3 acquisition, German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German would show transfer from either L1 German or English, respectively, or L2 English or German, respectively, into the L3. Whether the L1 (German/English) or L2 (English/German) is selected as the source of transfer into the L3 depends on the typological proximity between the L1, L2 and L3 (Rothman, 2013, 2015). Considering that German is generally closer to Dutch than English is to Dutch (see **2.3.2 Typology and Psychotypology** and **Chapter 4. Psychotypology**), we expect that German-speaking learners of L3 Dutch with L2 English show transfer from their L1 German into L3 Dutch, and English-speaking learners of L3 Dutch with L2 German show transfer from their L2 German into L3 Dutch.

In the initial version of the Typological Primacy Model, Rothman (2011) argues that the selection of either the L1 or the L2 as transfer source depends on the comparative typological proximity (i.e., objective linguistic proximity) or psychotypological proximity (i.e., subjective linguistic proximity) between the L1, L2 and L3. Psychotypological proximity—meaning psychotypology in the sense of Kellerman (1983, 1986)—can be defined as "a learner's perception of relative similarity between any two languages, which might or might not coincide with actual typology [i.e., typological proximity], the legitimate structural similarity between the two languages" (Rothman & Cabrelli Amaro, 2010, p. 214). Although not always the case, in many instances psychotypological proximity and typological proximity are the same (Rothman, 2011). However, if the psychotypological proximity does not coincide with the typological proximity, it is possible that the language that is typologically closer to the L3 and therefore provides linguistic properties for successful L3 acquisition, that is, positive transfer, is not activated (Rothman, 2011). In this case, learners might avoid transfer from the typologically closer language into the L3 (Kellerman, 1983) and opportunities for positive transfer may therefore be lost. On the other hand, it is possible that the language that is typologically more distant from the L3 and therefore provides

linguistic properties that might hinder successful L3 acquisition, that is, negative transfer, is activated (Rothman, 2011). For example, if a learner of L3 Dutch with knowledge of both German and English assumes that English is generally closer to Dutch than German is to Dutch, they transfer from English into Dutch, resulting in negative transfer with comparatively greater frequency. Transfer from German into Dutch, on the other hand, would result in positive transfer with comparatively greater frequency. In this regard, Odlin (1989) says that "an *objective* estimation of language distance can sometimes be misleading about the likelihood of transfer: in some cases, the *subjective* estimation of distance by learners can override an objective measure" (p. 142, emphasis by the author). In more recent papers, Rothman (2013, 2015) argues that transfer is subconsciously determined by the internal linguistic parser rather than by the learner's conscious perception of typological relatedness (see below).

The idea that typological proximity or psychotypological proximity might have a dominant role in transfer has a long tradition (e.g., Weinreich, 1953; Lado, 1957; Kellerman, 1979, 1983; Ringbom, 1987) and has only recently been adapted in research on L3 morphosyntactic transfer (e. g. Leung, 2003). Since then, this idea has evolved considerably. Rothman and Cabrelli Amaro (2010) tested between default L1 transfer, the L2 Status Factor Hypothesis, and the Cumulative Enhancement Model. They found that the L2 is the dominant source of transfer into the L3 with regard to properties of the Null-Subject Parameter in L3 learners of French (non-null-subject language) and Italian (null-subject language), with L1 English (non-null-subject language) and L2 Spanish (null-subject language). This supports the L2 Status Factor Hypothesis. Like L3 learners of Italian, L3 learners of French show transfer from L2 Spanish but not from L1 English. In the case of L3 learners of French, transfer from L2 Spanish leads to negative transfer, although transfer from L1 English would have led to positive transfer. Rothman and Cabrelli Amaro (2010) attribute this negative transfer from L2 Spanish into L3 French to the typological proximity or psychotypological proximity between Spanish and French. Considering the data of L2 learners of French and Italian, respectively, with L1 English, Rothman and Cabrelli Amaro (2010) suggest that a "psychotypological version" (p. 214) of the Cumulative Enhancement Model might explain their findings equally well.

In order to test whether typological proximity or even psychotypological proximity is the determining factor in L3 morphosyntactic transfer, Rothman (2011) investigates adjectival placement and interpretation in L3 learners of

Spanish with L1 Italian and L2 English, and L3 learners of Brazilian Portuguese with L1 English and L2 Spanish. In Spanish, Italian and Brazilian Portuguese, pre-nominal adjectives must be interpreted as non-intersective (Spanish: *Los valientes soldados* (*The brave soldiers*), kind-denoting interpretation), and post-nominal adjectives must be interpreted as intersective (Spanish: *Los soldados valientes* (*The soldiers who are brave*), set-denoting interpretation). In English, pre-nominal (the only available position) adjectives can be interpreted as both non-intersective and intersective, depending on whether the adjective is linked to a number phrase (non-intersective) or a noun phrase (intersective) (Rothman, 2011). Rothman (2011) indeed found that the typologically closer language is the dominant source of transfer into the L3, regardless of whether it is the L1 or the L2. These data conflict with the L2 Status Factor Hypothesis and led to the proposal of the Typological Primacy Model which is

> a modification of the … [Cumulative Enhancement Model] to the extent that both agree that transfer from either the L1 or the L2 is possible, but differently the … [Typological Primacy Model] predicts that transfer always obtains from either the L1 or L2 (i.e. it is not neutralized simply when it is not facilitative), and this is based on overall typological proximity (perceived or actual typological proximity), whether or not the language selected for transfer is the most economical choice given the choices available. (Rothman, 2011, p. 121)

In subsequent papers, Rothman (2013, 2015) further developed the Typological Primacy Model. He firstly provides arguments for his claim that transfer in L3 acquisition is complete (i.e., full transfer (Schwartz & Sprouse, 1996)) and early (i.e., at the beginning of L3 acquisition). Secondly, he argues that transfer is subconsciously determined by the internal linguistic parser, which assesses the structural similarity of the L1, L2 and L3 based on linguistic cues and, thirdly, he argues that L2 interlanguages can also transfer into the L3 (Rothman, 2013, 2015). The term *interlanguage* refers to the developing L2 grammar (Rothman, 2015). In the L3 literature, "it is customary … to speak of transfer from the 'L2'; however, we should always bear in mind that what is actually intended is transfer from the *L2-Interlanguage* which of course may not have converged on the L2-Target Language" (Schwartz & Spouse, 2021, p. 2, emphasis by the authors). Full and early L3 transfer is justified by the concept of cognitive economy: The mind is

naturally predisposed to tackle cognitive tasks with the least amount of effort (Rothman, 2015). Rothman (2015) argues that this natural disposition plays a crucial role in morphosyntactic transfer into the L3, aiming to reduce processing costs, and that full and early transfer helps avoid redundancy, thereby lessening cognitive effort: "If transfer is essentially reflexive to avoid redundancy in acquisition and thereby lessen the cognitive burden of an additional grammar, it should then obtain as early and completely as possible to be maximally useful towards these fundamental goals" (p. 184). This reasoning is also used with regard to the idea of wholesale transfer, which, in contrast to gradual property-by-property transfer, is considered to be faster and more cost-effective (Rothman, 2015). Note that Rothman et al. (2019) argue that property-by-property transfer might indeed take place both before and after wholesale transfer, and possibly in L4 acquisition and beyond, due to L3 experiences of negative transfer.

Whether the entire L1 or L2 is transferred into the L3 is determined by typological proximity as assessed by the linguistic parser, that is, "essentially the mental processor for language" (González Alonso & Rothman, 2017, p. 282), based on linguistic cues (Rothman, 2015). Rothman (2015) emphasises that morphosyntactic transfer into the L3 is not motivated by the language learner's perceived typological proximity, but by the linguistic parser's perceived typological proximity: The Typological Primacy Model "rejects the notion that conscious psychotypological assessment on the part of the learner brings anything to bear" (p. 185) and "from a generative perspective, it is reasonable to reject *a priori* that consciousness would have anything to bear specifically on underlying linguistic representation" (p. 185, emphasis by the author). However, the linguistic parser's unconscious perceived typological proximity and the language learner's conscious perceived typological proximity might coincide in many cases (Rothman, 2015; González Alonso & Rothman, 2017). Whether this is indeed the case in German-speaking learners of L3 Dutch with L2 English, and English-speaking learners of L3 Dutch with L2 German, is one of the questions we investigate in this dissertation (see **Chapter 4. Psychotypology**). The linguistic parser determines typological proximity based on structural similarity using hierarchical linguistic cues: *Lexicon → Phonology/Phonotactics → Functional Morphology → Syntactic Structure* (Rothman, 2013, 2015). As soon as the language (L1 or L2) with the most structural similarity is identified at the highest levels of linguistic cues, that is, after enough L3 input, it is transferred in its entirety into the L3 (Rothman, 2015). According to Rothman (2015), the linguistic parser

does not have to go through all linguistic cues, making lexical similarity, which is easier to identify by the linguistic parser than syntactic similarity in the initial state of L3 acquisition, the most important factor when it comes to structural similarity between the L1, the L2, and the L3 in morphosyntactic transfer into the L3. Rothman (2015) argues that

> Detecting lexical similarities is much more straightforward than detecting phonological similarities, morphological similarities and finally syntactic similarities, in this order. To start with, the latter two require more experience with the L3 and a deeper level of (implicit) knowledge about the L3 than do the former. (p. 185)

Before the linguistic parser has decided on whether to transfer the L1 or L2 into the L3, both the L1 and the L2 are accessible for morphosyntactic transfer into the L3 (Rothman, 2015). The question remains as to what *enough L3 input* (see above) means (see also Cabrelli & Puig-Mayenco (2021)). This is not made explicitly clear (Westergaard, 2021b). Rothman (2015) argues that the linguistic parser selects one of the previously acquired language (L1 or L2) "after minimally sufficient exposure to the L3" (p. 179) or "after a brief transitory initial stage of access to both the L1 and the L2 systems" (p. 180) or "at the earliest moment the parser is able to identify enough linguistic information from the L3 input stream to determine which of the two languages is likely typologically closer to the target L3" (p. 180). Note that Rothman (2013, 2015) replaced *initial state* with the concept of *initial stage(s)*. In a more recent description of the Typological Primacy Model, Rothman et al. (2019) use the example of an English-Italian bilingual L3 learner of Danish and a Turkish-German bilingual L3 learner of Japanese to demonstrate how the Typological Primacy Model predicts the relative timing of transfer into L3. Since there is a significant overlap in vocabulary between English and Danish, lexical information is sufficient for the linguistic parser to choose to transfer from L1 English into L3 Danish "quite quickly" (Rothman et al., 2019, p. 166) in the case of the English-Italian bilingual L3 learner of Danish. In the case of the Turkish-German bilingual L3 learner of Japanese, since the lexicon alone is not helpful in determining typological proximity, the linguistic parser requires comparison at further levels of the hierarchy, that is, phonology, morphology, and syntax, before typological proximity can be established. Rothman et al. (2019) further argue that

> If on the right track, the … [Typological Primacy Model], combined with a careful comparative consideration of the two grammars (phonologically, morphologically and syntactically), will reveal predictions regarding exactly what in the hierarchy – at what level – the balance should tip in favor of one or the other language being predicted for transfer. This also means that the … [Typological Primacy Model] provides a means to determine relative timing for how long it will take for transfer selection to occur; transfer is predicted to happen in less time for the first case [i.e., the English-Italian bilingual L3 learner of Danish] than in it is in the latter scenario [i.e., the Turkish-German bilingual L3 learner of Japanese], as the latter requires more input before the parser can reach an informed conclusion. (p. 166)

After either the entire L1 or L2 is transferred into the L3, structural similarity at the property-by-property level is no longer a decisive factor (Rothman, 2015). Thus, in the case of German-speaking (L2 English) and English-speaking (L2 German) learners of L3 Dutch, the linguistic parser can already determine at the first level (i.e., *Lexicon*) that German is closer to Dutch than English is to Dutch. This is because the English lexicon deviates significantly from the Dutch and German lexicons due to the strong influence of French during the Norman occupation of the British Isles from 1066 (Gooskens & Heeringa, 2004; Baker, 2016; see also Rothman et al., 2019).

Rothman (2011) also points to the possibility that the Typological Primacy Model might not be applicable to closely related languages:

> We do not know what variables determine transfer if typology is simply, given the particular combination of languages, not relevant at all. This would occur, for example, … where the L3 is equally typologically similar to the L1 and the L2. … Under such circumstances, it would be interesting to test whether or not there indeed is an L2 effect. (p. 122)

However, there are studies that have investigated morphosyntactic transfer into the L3 between closely related languages. Stadt et al. (2016, 2018) tested verb placement in declarative root clauses in two groups of participants. The first group had L1 Dutch (V-to-T movement), L2 English (no V-to-T movement), and L3 French (V-to-T movement). The second group had L1 Dutch (V-to-T movement), L2 English (no V-to-T movement), and L3 German (V-to-T movement). They

found transfer from L2 English into L3 French in the first group of learners, and transfer from L1 Dutch into L3 German in the second group of learners. The first study (Stadt et al., 2016) provides evidence for both the L2 Status Factor Hypothesis and the Typological Primacy Model, since English is the L2, but also the language closer to French than Dutch on a lexical level. However, the second study (Stadt et al., 2018) provides evidence for the Typological Primacy Model, since Dutch is the language closer to German than English on a lexical level. Rothman et al. (2019) argue that the predictions made by the Typological Primacy Model are supported by the study by Stadt et al. (2018), even when the languages under observation are closely related. To our knowledge, up to now, Stadt et al. (2018) is the only study investigating morphosyntactic transfer into the L3 between the closely related West Germanic languages Dutch, English and German. However, instead of using a mirror-image methodology, Stadt et al. (2018) only tested one group of learners: L1 Dutch → L2 English → L3 German. In a study that did not in fact investigate transfer, but the learnability of L3 Dutch, Schepens et al. (2016) found that linguistic proximity between both the L1 and L3 as well as the L2 and L3 plays a significant role in the learning of L3 Dutch. However, the effect of a typologically close L1 is stronger than the effect of a typologically close L2. German-speaking learners of L3 Dutch with L2 English had higher proficiency scores for L3 Dutch than English-speaking learners of L3 Dutch with L2 German (Schepens et al., 2016).

To sum up, the Typological Primacy Model proposes full transfer of either the L1 or the L2 into the L3 in the initial state of L3 morphosyntactic acquisition, based on typological proximity determined by the linguistic parser using hierarchical linguistic cues. Schwartz and Sprouse (2021) argue that the Typological Primacy Model is the most promising model for predicting transfer into the L3, and there is plenty of evidence in favour of the Typological Primacy Model in the literature (see, e.g., Rothman et al., 2019). The meta-analysis by Puig-Mayenco et al. (2020) shows that 60.5% of the studies included (43 out of 71) show transfer that can be ascribed to typological transfer. Twenty-two of these studies controlled for mirror-image groups, and a significant association is found between typological transfer and using mirror-image groups, (22 vs. 21; $p = .01$). In addition, a significant association is found between typological transfer and studies where at least one of the previously acquired languages (L1 or L2) is genetically related to the L3 (27 vs. 16; $p = .01$).

2.2.5 Linguistic Proximity Model

The Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), proposes that all previously learned languages are equally available for transfer in subsequent language learning. Therefore, both the L1 and L2 serve as sources of transfer into the L3. If the Linguistic Proximity Model best predicts morphosyntactic transfer in L3 acquisition, German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German can transfer from both L1 German or English, respectively, and L2 English or German, respectively, into the L3. In a study on adverb placement and subject-auxiliary inversion in L3 learners of English (ADV-V/AUX-S) with L1s Norwegian (V-ADV/AUX-S) and Russian (ADV-V/S-AUX), and two groups of L2 learners of English with L1 Norwegian and L1 Russian, respectively, Westergaard et al. (2017) found that both previously learned languages (Norwegian and Russian) positively and negative influence L3 acquisition. Note that the predictions made by the Linguistic Proximity Model (Westergaard et al. 2017), in contrast to the other models of L3 morphosyntactic transfer discussed in this dissertation, are based on simultaneous bilinguals (Norwegian-Russian) acquiring an L3 (English). See Bardel and Falk (2021) who question the ability of the study of Westergaard et al. (2017) to serve as support for a model of L3 learning, but see also Westergaard (2021a, 2021b). See Rothman (2015) for a discussion on transfer in L3 acquisition in different types of L3 learners.

Based on the notion that different languages of a multilingual are not completely separate and stay active even when not used (Lemhöfer et al., 2004; Bialystok, 2011; Slabakova, 2017), Westergaard et al. (2017) argue that all previously learned languages are available in L3 acquisition, that neither the L1 nor the L2 are blocked in L3 acquisition, and that L3 acquisition is cumulative. Moreover, language learners are sensitive to micro-variation between the L1, L2, and L3 (see also the Micro-Cue Model on L1 acquisition (Westergaard, 2009, 2014)). Instead of overall typological proximity, which might only play a role in early stages of L3 acquisition, similarity of abstract linguistic properties is the main factor in morphosyntactic transfer into the L3 (Westergaard et al., 2017, Westergaard, 2021a)). When comprehending or producing a particular linguistic property in the L3, the corresponding linguistic property of both the L1 and the L2 are activated and compete with each other for linguistic proximity, and the linguistic property with the higher degree of activation is transferred into the L3 (Westergaard et al.,

2017; Luan et al., 2024). Thus, transfer in L3 acquisition occurs in a property-by-property fashion, predicting different transfer patterns for different linguistic properties (Westergaard et al., 2017). Westergaard (2021a) refers to this as

> Full Transfer Potential, meaning that 'anything may transfer', not that 'everything does transfer'. This is different from the partial transfer models of the 1990s [see **2.1.2 Transfer in L3 Acquisition**] in that there is no restriction on the kind of linguistic property that may transfer. However, it also differs from … [Full Transfer/Full Access (Schwartz & Sprouse, 1996)] in that there is no wholesale transfer (copying) at the initial state; instead, transfer takes place as a result of parsing, property by property. (p. 389)

Furthermore, Westergaard et al. (2017) argue that the Linguistic Proximity Model allows for both positive and negative transfer in L3 acquisition, the latter being a misanalysis of the L3 input, that is, the misconception that a linguistic property is shared between the L3 and the L1/L2, and/or the result of learners not having had sufficient L3 input. Moreover, Westergaard et al. (2017) argue against the idea of cognitive economy as justification for wholesale transfer of one grammar as proposed by the Typological Primacy Model (see Rothman, 2015). In their view, cognitive economy could equally support cumulative language learning and they argue that property-by-property transfer would reduce the effort required to unlearn incorrectly transferred linguistic properties (Westergaard et al., 2017). According to Westergaard (2021a), "it is not at all clear that transferring a lot once is cognitively more economical than transferring a little many times" (p. 393).

Rothman et al. (2019) criticise the fact that the Linguistic Proximity Model does not explain what mechanisms cause a misanalysis of the L3 input, which in their view means that the model is not testable against other models of L3 morphosyntactic transfer, and they call for refinements to the model to reveal its predictive power (see also Bardel & Falk, 2021). Moreover, they argue that property-by-property transfer should result in negative transfer less often (Rothman et al., 2019). However, Rothman et al. (2019) acknowledge the novelty of the Linguistic Proximity Model, the lack of studies specifically designed to test it against other models of L3 morphosyntactic transfer (see also Westergaard, 2021a), and the fewer chances to incorporate refinements in response to critique. In a more recent paper on the Linguistic Proximity Model, Westergaard (2021a) responds to the critique from Rothman et al. (2019) and argues that transfer from either the L1

or the L2 is not a question of choosing "either the right or wrong option" (p. 397), but

> Given that the L3 is hardly ever identical to either of the previously acquired languages, transfer will often be … [negative] either way, even when the L3 learner chooses the option from the structurally more similar language. … What property-by-property transfer captures then is the insight that the more languages the learner knows, the easier it will be to learn further languages, since the existing repertoire will be larger. But the learner will nevertheless often be slightly (or even completely) wrong. (p. 397)

However, González Alonso and Rothman (2021) argue that it is still not clear how the Linguistic Proximity Model operationalises the notion of misanalysis in practical terms, and according to Cabrelli and Puig-Mayenco (2021), "the … [Linguistic Proximity Model], five years on from its original offering, still lacks an *ex ante* explanation of when … [negative] transfer is predicted to occur, without which, explicit (testable) predictions are not possible" (p. 466, emphasis by the authors); see also Bardel & Falk (2021) and Westergaard (2021b).

A final point to consider is that more recently Westergaard (2021a, 2021b) does not exclude additional factors (see also **2.2.6 Scalpel Model**) from playing a role in L3 morphosyntactic transfer. These factors might include age, recency of use, proficiency, saliency, construction frequency, language instruction, metalinguistic knowledge, language dominance (see also Fallah et al. (2016), Fallah & Jabbari (2018), Jabbari et al. (2018)), and the L2 status factor (see **2.2.2 L2 Status Factor Hypothesis**) (Westergaard, 2021a). According to Westergaard (2021a), the main question for further research is "What factors decide which slice to take – when?" (p. 400).

The meta-analysis by Puig-Mayenco et al. (2020) shows that 23.9% of the studies included (17 out of 71) show transfer that can be explained with the macro-variable *Hybrid transfer*, that is, simultaneous transfer from both the L1 and L2. According to Puig-Mayenco et al. (2020), the term

> *Hybrid transfer* refers to those cases where influence from both languages could be observed for the same group, in either of three possible situations: combined influence on the same linguistic property (a true hybrid value); influence on different properties, that is, when in a single experiment with

> two conditions one is seemingly influenced by language X (L1), and the other by language Y (L2); and, finally, those situations where it was not possible to exclude a hybrid value (tease out the L1 from the L2) because both the L1 and L2 are functionally the same. (p. 39, emphasis by the authors)

Only two of these studies used mirror-image groups, and a significant association is found between hybrid transfer and studies not using a mirror-image methodology (15 vs. 2, $p = .03$). In addition, a significant association is found between hybrid transfer and L3 production studies (10 vs. 7, $p = .04$), thus, production experiments seem to correlate with observing hybrid transfer.

2.2.6 Scalpel Model

The Scalpel Model (Slabakova, 2017), another recent model of L3 morphosyntactic transfer, builds on the theoretical foundation of the Linguistic Proximity Model and proposes that all previously learned languages are equally available for transfer in subsequent language learning. Therefore, both the L1 and L2 serve as sources of transfer into the L3. If the Scalpel Model best predicts morphosyntactic transfer in L3 acquisition, German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German can transfer from both L1 German or English, respectively, and L2 English or German, respectively, into the L3. Whereas the Linguistic Proximity Model in its more recent version argues that additional factors might play a role in morphosyntactic transfer into the L3 (see **2.2.5 Linguistic Proximity Model**), the Scalpel Model argues that in addition to structural proximity, additional factors such as construction frequency in the L3, and language activation and use indeed do play a role in morphosyntactic transfer into the L3. Unlike the other models of L3 morphosyntactic transfer we have discussed so far, the Scalpel Model is not based on a particular study. Instead, it draws its predictions from several cognitive, experiential and structural factors that are argued to determine language acquisition in general, and, taken together, argue for transfer in a property-by-property fashion in L3 acquisition, however, not for wholesale transfer into the L3 as proposed by the Typological Primacy Model (Slabakova, 2017):

> I argue that the grammars already acquired act with a scalpel-like precision to extract the L1 or L2 options relevant to the acquisition task at hand. Therefore, transfer is selective and works property by property. However, scalpels cannot cut through bone. There are many additional factors affecting transfer beyond the L1 transfer, L2 transfer, and psychotypology, such as construction frequency, availability of clear unambiguous input, prevalent use, and structural linguistic complexity, among others. When we investigate the same groups of learners' performance on different properties, such additional factors can give rise to differential outcomes that cannot be explained by unconscious psychotypology or the wholesale influence of only one previously acquired language. (Slabakova, 2017, p. 653)

Slabakova (2017) further argues, that

> There is no need for wholesale initial transfer because the scalpel can successfully single out the uniquely relevant features and properties. However, the scalpel can be blunted or shunted or slanted by additional factors pertaining to the relevant properties, such as processing complexity, misleading input, and construction frequency in the target L3. (p. 655)

In Slabakova's (2017) view, wholesale transfer of one language and, thus, blocking off the other language is not economical in terms of processing costs, especially if transfer of the blocked off language would have a positive effect on the L3. Slabakova (2017) argues that it might be more economical to consider all the available linguistic information and to check property-by-property. But see Rothman et al. (2019) for arguments against the claim that wholesale transfer blocks of the other grammatical system, but instead reduces the activation of the other language allowing more efficient resource allocation.

Within the Scalpel Model, it is assumed that in addition to the scalpel, which extracts relevant properties from the L1 and L2 for L3 acquisition, various other factors also play a role in L3 acquisition, and in certain circumstances are interfering with the scalpel's precision. For example, construction frequency in the L3 is considered to be a determining factor in L3 acquisition, when the L3 input does not provide the necessary evidence of a linguistic property due to its very low frequency (Slabakova, 2017). It is argued that negative evidence, that is, overt correction, cannot change the grammar because it is not reliably provided to all

learners, and learners might not attend to it (White, 1989; Slabakova, 2017). Change in a learner's grammar is effectively achieved only through positive evidence derived from abundant and comprehensible input (Slabakova, 2017, see also VanPatten, 2015; González Alonso & Rothman, 2017). Furthermore, the factors language activation and use are considered to determine the source of L3 transfer which is in line with Fallah et al. (2016), Fallah and Jabbari (2018), and Jabbari et al. (2018), who claim that the dominant language of communication (L1 or L2) might be the main source of transfer into the L3 (Slabakova, 2017, see also Angelovska et al., 2023).

According to Rothman et al. (2019), the criticism expressed for the Linguistic Proximity Model in regard to its predictive power also applies to the Scalpel Model, however, the novelty of the model must be considered, which means that the Scalpel Model has not yet been extensively tested against the other models of L3 morphosyntactic transfer, and has not had much opportunity to incorporate refinements in response to critique. To our knowledge, no updated version of the Scalpel Model has been published at the time of writing of this dissertation. Furthermore, the question arises as to whether the Scalpel Model in its current form is empirically verifiable, given that it assumes numerous interacting additional factors in morphosyntactic transfer into the L3. Note that the same might hold true for the Linguistic Proximity Model in its more recent version (see **2.2.5 Linguistic Proximity Model**). These additional factors complicate the isolation of individual factors, each influencing morphosyntactic transfer in L3 acquisition, making it seemingly impossible to design controlled experiments. The broad range of additional factors might obscure specific predictions, challenging the model's ability to provide clear, testable hypotheses and allow reliable empirical verification.

2.2.7 Discussion of Models of L3 Morphosyntactic Transfer

The models of L3 morphosyntactic transfer discussed show both similarities and differences at various levels with regard to their predictions of morphosyntactic transfer into the L3. See **Table 1** for key features of the models.

Table 1: *Key Features of Models of L3 Morphosyntactic Transfer*

Model	default L1 transfer (no formal model)	L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011)	Cumulative Enhancement Model (Flynn et al. 2004)
Direction of transfer	L1 → L3	L2 → L3	L1 *and* L2 → L3
Type of full transfer	wholesale transfer	wholesale transfer	piecemeal transfer
Result of transfer	positive & negative	positive & negative	positive & neutral
Transfer factor	L1 status factor	L2 status factor (metalinguistic knowledge)	maximal facilitation

Table 1: *Key Features of Models of L3 Morphosyntactic Transfer (continued)*

Model	Typological Primacy Model (Rothman 2011)	Linguistic Proximity Model (Westergaard et al. 2017; Westergaard 2021a, 2021b)	Scalpel Model (Slabakova 2017)
Direction of transfer	L1 *or* L2 → L3	L1 *and* L2 → L3	L1 *and* L2 → L3
Type of full transfer	wholesale transfer	piecemeal transfer	piecemeal transfer
Result of transfer	positive & negative	positive & negative	positive & negative
Transfer factor	typological proximity	structural proximity (additional factors)	structural proximity & additional factors

One feature that all models of L3 morphosyntactic transfer share is that they do not or at least not explicitly include the factor *language proficiency*. Note that in the literature on the effect of proficiency on morphosyntactic transfer into the L3, a distinction is made between general proficiency, that is, holistic proficiency, and proficiency in relation to a specific grammatical property, that is, analytic proficiency (Eibensteiner, 2023; see also Sánchez, 2020). High general proficiency does not imply that a specific grammatical property has been acquired, and the mastery of a specific grammatical property does not imply high general proficiency. According to Eibensteiner (2023), the measurement of analytic proficiency is especially important if positive transfer is to be investigated, as positive transfer of a grammatical property will only occur if language learners have a sufficiently high level of (analytic) proficiency in the grammatical property under investigation (e.g. Falk and Bardel 2010).

It has long been argued that proficiency in both the L3 and the L2 influence the source and amount of transfer into the L3 (see, e.g., Bardel & Sánchez, 2020; Angelovska et al., 2023). With regard to L3 proficiency, it is argued that transfer in

general is more likely to occur at lower levels of L3 proficiency, when learners' L3 knowledge is still fragmentary and they need to fill in knowledge gaps in the L3, thus transferring previously acquired languages as a compensatory strategy for the lack of L3 proficiency (e.g., Williams & Hammarberg, 1998; De Angelis, 2007; Eibensteiner, 2023). Moreover, González Alonso and Rothman (2017) argue that at higher levels of L3 proficiency it is impossible to distinguish between positive transfer and L3 acquisition.

With regard to L2 proficiency, Williams and Hammarberg (1998) already argue that L2 proficiency plays an important role in transfer into the L3. However, empirical evidence is still scarce (De Angelis, 2007; Sánchez & Bardel, 2017; Eibensteiner, 2023; see also Bardel & Sánchez, 2020) and potential effects of L2 proficiency are often conflated with those of other factors, thus making it difficult to isolate effects of L2 proficiency in morphosyntactic transfer into the L3. In general, it is believed that L2 transfer occurs more often at the initial stages of L3 acquisition (Sánchez & Bardel, 2017). However, results on the effect of different levels of L2 proficiency in morphosyntactic transfer in L3 acquisition are conflicting. On the one hand, it is argued that transfer from the L2 into the L3 seems to be more likely with higher L2 proficiency (e.g., Williams & Hammarberg, 1998; Hammarberg, 2001; Ringbom, 2001; Tremblay, 2006; Jarvis & Pavlenko, 2008; Bardel & Sánchez, 2020). Moreover, it is argued that language learners must reach "a sufficiently high level in their L2" (Falk & Bardel, 2011, p. 77) for transfer to occur, and grammatical properties must be well internalized or even automatized in the L2 in order to be transferred from the L2 into the L3 (Ringbom & Jarvis, 2009; see also Lindqvist, 2019). On the other hand, it has also been shown that transfer from the L2 into the L3 occurs, even when L2 proficiency is low or intermediate (e.g., Flynn et al., 2004; Sánchez, 2020; see also De Angelis, 2007). For example, investigating syntactic transfer from L2 German into L3 English in participants with L1s Spanish and Catalan, Sánchez (2020) found more negative transfer from the L2 into the L3 in participants with low L2 proficiency than in participants with high L2 proficiency.

The meta-analysis by Puig-Mayenco et al. (2020) shows no significant associations between either beginner or post-beginner methodologies, that is, high or low proficiency in the L3, and the macro-variable *L2 Transfer*. The same lack of significant association was found for the other macro-variables tested: *L1 Transfer*, *Typological transfer*, *Hybrid transfer*, that is, simultaneous transfer from both the L1 and L2 (see **2.2.5 Linguistic Proximity Model**), and *Non-facilitative transfer*,

that is, negative transfer. Thus, there seems to be no indication that morphosyntactic transfer into the L3 is more likely when L3 proficiency is high or low. Whether or not morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and/or L2, is one of the questions we investigate in this dissertation (see **Chapter 5. Processing and Comprehension** and **Chapter 6. Production**).

A further feature that differs in the models of L3 morphosyntactic transfer is whether or not they only predict transfer into the L3 at the initial state of L3 acquisition. In the literature, default L1 transfer, the L2 Status Factor Hypothesis, the Cumulative Enhancement Model, and the Typological Primacy Model are often considered to explain and predict transfer into the L3 at the initial state of L3 acquisition, while the Linguistic Proximity Model and the Scalpel Model are considered to explain and predict transfer into the L3 throughout L3 development (e.g., Angelovska & Hahn, 2017). However, Puig-Mayenco et al. (2020) argue, that the L2 Status Factor Hypothesis and the Cumulative Enhancement Model explain and predict transfer into the L3 at any stage of L3 acquisition, and that the Typological Primacy Model, although intended to model transfer at the initial state of L3 acquisition, could be used to make predictions about learnability issues throughout L3 development (see also Rothman (2013, 2015) for the concept of *initial stage(s)*). Moreover, Rothman (2010) argues that "one is not limited to looking at the initial state to test the … [Typological Primacy Model]" (p. 113). Furthermore, several studies investigating transfer into the L3 beyond the initial state of L3 acquisition provide support for the L2 Status Factor Hypothesis and/or the Typological Primacy Model (Puig-Mayenco et al., 2020). However, Cabrelli and Puig-Mayenco (2021) argue that at later stages of L3 acquisition it can be challenging to isolate transfer into the L3 from L3 acquisition.

Another factor not included in the models of L3 morphosyntactic transfer is the factor *language mode* (i.e., language processing and comprehension vs. language production). In research on L1 acquisition (e.g., Hendriks & Koster, 2010; Hendriks, 2014; but see also Ruigendijk et al., 2010) and L2 acquisition (e.g., Unsworth, 2009), different patterns in results between comprehension vs. production tasks have been frequently discussed and found, and it is argued that the factor *language mode* might also be an important factor in L3 acquisition (Puig-Mayenco et al., 2020). In the meta-analysis by Puig-Mayenco et al. (2020), a significant association is found between L3 production studies and L2 transfer (12 vs. 8, $p = .02$) as well as the macro-variable *Hybrid transfer* (10 vs. 7, $p = .04$), thus, production experiments seem to correlate with observing both L2 transfer and

simultaneous transfer from both the L1 and L2. Puig-Mayenco et al. (2020) assume that while production, like comprehension, involves decoding (though in the opposite order), production requires additional processes:

> Comprehension principally requires decoding, whereas production has further and more complex requirements (e.g., selecting words from the mental lexicon, assigning syntactic representations, passing from the mental computational representation to the phonological form for articulation, etc.). (Puig-Mayenco et al., 2020, p. 48)

Due to the higher level of complexity in language production as compared to language comprehension (see also, e.g., Prévost et al., 2017), it might be the case that production introduces variables making the L2 more accessible for L3 production than for L3 comprehension, especially at lower levels of proficiency (Puig-Mayenco et al., 2020). Note that while we agree that comprehension and production are not the same, we do not necessarily agree that production is more complex than comprehension. Moreover, the L2 might be more easily accessed during production due to its foreign status, that is, it is stored in the declarative memory system as explicit metalinguistic knowledge (Bardel and Falk, 2012; Puig-Mayenco et al., 2020). Puig-Mayenco et al. (2020) argue further that studies supporting default L2 transfer in production might only capture superficial, processing-based effects rather than true underlying representations in the developing L3 system, since production is more vulnerable to influences beyond grammatical representation. According to the authors, it makes sense that the surface output effects of production would show an L2 bias due to metalinguistic and/or recency effects, as the L2 is learned in a similar way to the L3, unlike the L1 (Puig-Mayenco et al., 2020). Whether or not there is a difference between language comprehension and language production in morphosyntactic transfer into the L3, is one of the questions we investigate in this dissertation (see **Chapter 5. Processing and Comprehension** and **Chapter 6. Production**).

2.2.8 Impact of Teaching on Morphosyntactic Transfer in L3 Acquisition

A final point to consider is the effect of language teaching on morphosyntactic transfer in L3 acquisition which is not generally included in the models of L3 morphosyntactic transfer. Only the L2 Status Factor Hypothesis in its more recent

version (Falk et al., 2015; Bardel & Sánchez, 2017) adopts the idea that language teaching can affect morphosyntactic transfer in L3 acquisition by enhancing learners' metalinguistic knowledge (see **2.2.2 L2 Status Factor Hypothesis**), and, according to Bardel (2019), enhancing metalinguistic knowledge is one of the most important tasks in the multilingual classroom.

It is important to distinguish between the effect of language teaching on transfer that has already occurred, and the effect of language teaching on transfer that has not yet happened. In other words, there is a difference between pedagogical interventions that "undo" (González Alonso & Rothman, 2017, p. 289) negative transfer, and those that aim at avoiding negative transfer and promoting positive transfer. Traditionally, transfer is viewed as an unconscious and unintentional process (see also Rothman, 2015) often leading to difficulties in foreign language acquisition (Fuster & Neuser, 2021; Fuster, 2024). As a consequence, foreign languages are traditionally taught in isolation in the multilingual classroom (i.e., functional monolingualism (*Prinzip der funktionalen Einsprachigkeit*, see, e.g., Reitsma, 2016)) with the aim to minimize negative transfer from the L1 and/or L2 into the L3 (Cenoz & Gorter, 2020, see also Cummins, 2017). Nowadays, however, transfer is increasingly recognised as a conscious and intentional strategy in the multilingual classroom (see also Herdina & Jessner, 2002) to control learners' use of transfer and enhance the language learning process (Fuster & Neuser, 2021; Fuster, 2024). This is also reflected in the concept of *teaching for transfer* (Cummins, 2008, 2017), that is, raising awareness of similarities between languages in order to use transfer as a resource, and the model of pedagogical translanguaging (Cenoz & Gorter, 2014, 2020; see below).

It is generally agreed that the models of L3 morphosyntactic transfer discussed above make predictions about unconscious morphosyntactic transfer from the L1 and/or L2 into the L3. These predictions are considered useful for language teachers and have practical implications for the multilingual classroom (González Alonso & Rothman, 2017; Bardel, 2019; Lindqvist, 2019, Angelovska & Hahn, 2023). Note, however, that "it is not often the case that insights from formal acquisition theories or empirical studies are taken to bear on classroom practice" (González Alonso & Rothman, 2017, p. 283; see also, e.g., Spada, 2015, for L2 acquisition; Berthele, 2019). Nevertheless, González Alonso and Rothman (2017) argue that this is "a missed opportunity" (p. 283), and we share this view. Take, for example, the L2 Status Factor Hypothesis and the Typological Primacy Model. If the former transfer model is correct, we can predict transfer from L2 English into L3 Dutch for

German-speaking learners of L3 Dutch with L2 English. If, on the other hand, the latter transfer model is correct, we can predict transfer from L1 German into L3 Dutch for the same group of learners. Since it is assumed that there is only one source of morphosyntactic transfer into the L3—namely either L1 German or L2 English—realisations of specific linguistic properties that hinder successful L3 acquisition, leading to negative transfer, are also transferred into the L3. Knowing this, language teachers can anticipate instances of negative transfer in L3 morphosyntax and create pedagogical interventions to undo negative transfer (González Alonso & Rothman, 2017). According to González Alonso and Rothman (2017), undoing negative transfer involves implicit pedagogical intervention. These interventions include plenty of input and classroom activities designed to make the ungrammaticality of a specific form of a linguistic property transferred from either the L1 or L2 into the L3 saliently evident to the linguistic parser during L3 processing (González Alonso & Rothman, 2017). This approach forces parsing failures and promotes grammatical restructuring of the L3 (González Alonso & Rothman, 2017). Explicit pedagogical interventions alone are considered insufficient, as a change at the level of implicit grammar is desired (see also VanPatten, 2015), and the same holds true for focussing solely on positive input (González Alonso & Rothman, 2017).

Drawing on the notion of explicit pedagogical interventions to undo negative transfer, Bardel (2019) argues that learners should be made aware of negative transfer and be pointed to similarities and differences between the L1, L2 and L3. Therefore, language teachers should be able to point to instances of negative transfer, rather than mark them as errors (Jessner et al., 2016; Lindqvist, 2019). Thus, language teachers should be experienced multilingual language learners themselves having basic knowledge of the grammars of the most common languages in the multilingual classroom, which, however, is considered an impossible task (Jessner, 2008; Lindqvist, 2019). Nevertheless, for the L3 Dutch classroom in the German language area—and also in the English language area—it is not at all unusual for language teachers to have basic knowledge of the most common languages, namely German and English (see **2.3.1 Dutch in the German and English Language Areas**). As far as this is concerned, the prerequisites are in place to include the closely related languages German and English in the L3 Dutch classroom, to contrast similarities and differences and thereby promote the acquisition of L3 Dutch. According to Ringbom (2007) and Ringbom and Jarvis (2009), learners constantly search for similarities between languages and,

moreover, easily find them when learning closely related languages. Especially in learning closely related languages, language teachers should systematically emphasise similarities and—more importantly—differences between the languages in question (Bardel, 2019). This is also in line with the model of pedagogical translanguaging (Cenoz & Gorter, 2014, 2020), which recognizes transfer as a conscious strategy in the multilingual classroom. For a discussion of the umbrella term *translanguaging* (Williams, 1994; Baker, 2001) and the two main proposed forms of translanguaging—namely spontaneous translanguaging and pedagogical translanguaging—see Cenoz and Gorter (2017), Bonacina-Pugh et al. (2021), Fuster (2024), and Fuster and Bardel (2024). According to Fuster (2024), "In contrast to spontaneous translanguaging, the notion of transfer is core to pedagogical translanguaging" (p. 326). Pedagogical translanguaging can be defined as activating "the pre-existing knowledge that … [language learners] have in their multilingual repertoire" (Cenoz & Gorter, 2021, p. 43) "by comparing elements of their different languages … at different levels (phonetic, lexical, morphosyntactic, pragmatic, discursive)" (Cenoz & Gorter, 2023, p. 191) to "transfer knowledge across languages" (Fuster & Bardel, 2024, p. 5). Moreover, Cenoz and Gorter (2011) suggest that language teachers should "highlight the relationships, [that is, the similarities and differences,] between languages by creating specific activities so as to enhance metalinguistic awareness" (p. 360). The term *metalinguistic awareness* "refers to an awareness of aspects about a language system" (Fuster, 2024, p. 333). However, according to Jessner (2008), emphasising the similarities and differences between different languages is rarely practiced in the multilingual classroom (but see Fuster & Bardel, 2024).

In the case of German-speaking and English-speaking learners of L3 Dutch, it is not entirely clear what the reality is in the L3 Dutch classroom and how language teachers deal with the similarities and differences between Dutch, German and English. In the German language area, there are two reference books on Dutch didactics available for the German teacher training programme. In these reference books it is argued that functional monolingualism generally should be the norm in teaching Dutch (Braam & Wenzel, 2014; Reitsma, 2016). However, deviation from this norm is recommended with regard to classroom management but also contrastive linguistic analyses, if other languages such as German and English become important for the acquisition of specific foreign language competences in L3 Dutch (Braam & Wenzel, 2016). The core curricula for Dutch as a foreign language in lower (years 6-10, *Sekundarstufe I*) and upper (years 10-13,

Sekundarstufe II) high school education in Lower Saxony and North Rhine-Westphalia also generally prescribe functional monolingualism as a teaching principle (MK, 2017a; MK, 2017b; MSB, 2020). However, the importance of the contrastive analysis of Dutch, German and English is also emphasised. It is pointed out that Dutch, German and English are closely related languages, and that due to the language learners' existing linguistic knowledge a contrastive approach should be used when teaching, for example, vocabulary or grammar, to increase linguistic awareness and enhance language learning (MSB, 2014; MK, 2017b; MSB, 2020). In this context, the core curriculum for Dutch as a foreign language in upper high school education in North Rhine-Westphalia states that the acquisition of comparative, analytical and metalinguistic strategies promotes individual multilingualism and corresponds with the guiding principle of independent learning (MK, 2014). It can be seen, therefore, that the formal requirements for including German and English in German L3 Dutch classrooms are in place. The question is, however, whether teachers actually do so. As far as we know, no studies have been carried out on this and further research is needed to answer this question. For contrastive approaches in Dutch, English and German classrooms in the Netherlands see Leenders, 2023; Leenders et al., 2024). The work of Urbanek (2022) might provide an initial impression of the position of German and English in L3 Dutch classrooms in Germany. Investigating the use of movie subtitles in the L3 Dutch classroom, Urbanek (2022) found that monolingualism is the guiding principle: The majority of the 83 respondents, which is a considerable number and represents the majority of teachers of Dutch as a foreign language in Lower Saxony and North Rhine-Westphalia, only use Dutch in the context of subtitles (87.95%). While German subtitles (12.05%) seem to play a minor role in German L3 Dutch classrooms, English subtitles (0.00%) are not used at all. Functional monolingualism was given as one of the main reasons for not including German and English in the L3 Dutch classroom (Urbanek, 2022, see also Bonacina-Pugh et al., 2021). To effectively promote the systematic contrasting of similarities and differences between Dutch, German and English in the L3 Dutch classroom, topics such as *(morphosyntactic) transfer*, *translanguaging*, and *interventions to enhance metalinguistic knowledge* should be included in language teacher education. However, this is often not practiced (see, e.g., Ballinger et al., 2020; Bonacina-Pugh et al., 2021). An exception can be found in the work of Kopeckova and Poarch (2019, 2022), who provide an example of L3 English teacher education at the University of Münster. We assume that, due to the increased interest in

multilingualism, the above-mentioned topics will also increasingly find their way into Dutch teacher training programmes.

2.2.9 Conclusion

A review of the literature shows that morphosyntactic transfer in L3 acquisition is a highly complex phenomenon, and that attempts have been made to model morphosyntactic transfer into the L3. The reviewed models of L3 morphosyntactic transfer within the generative paradigm each focus on a single transfer factor to predict transfer. Only the more recent Scalpel Model (see **2.2.6 Scalpel Model**)—and possibly also the Linguistic Proximity Model in its more recent version (see **2.2.5 Linguistic Proximity Model**)—uses a multifactorial approach to predict morphosyntactic transfer from the L1 and L2 into the L3. Note that the L2 Status Factor Hypothesis in its more recent version could also be seen as a multifactorial model of transfer into L3 morphosyntax (see **2.2.2 L2 Status Factor Hypothesis**). As is evident from the literature review, research on L3 acquisition has supported some models of L3 morphosyntactic transfer and rejected others. As is the case for default L1 transfer, there is little evidence in support of the Cumulative Enhancement Model, and numerous studies have shown evidence for negative transfer which also goes against the Cumulative Enhancement Model. The latter is the reason why we do not consider the Cumulative Enhancement Model for the discussion of our results. While the Linguistic Proximity Model and the Scalpel Model are considered promising, they are also seen as needing further refinement, and the question remains whether these models in their current forms are empirically verifiable, given that they assume numerous interacting additional factors in morphosyntactic transfer into the L3. In addition, they are in direct competition with wholesale models like the L2 Status Factor Hypothesis and the Typological Primacy Model, and there are many indications of wholesale transfer (e.g., Schwartz & Sprouse, 2021). There is evidence in favour of the L2 Status Factor Hypothesis, to a greater extent than for default L1 transfer, however, the Typological Primacy Model seems to make the best prediction for morphosyntactic transfer into the L3, for which there is much evidence in the literature (Puig-Mayenco et al., 2020; Schwartz & Sprouse, 2021). The overall findings highlight the dynamic nature of multilingualism, showing that both the L1 and L2 might serve as sources of transfer into L3 morphosyntax. However, it remains unclear which factors determine the source of transfer and which specific properties are

affected. In this dissertation, we test the two models of L3 morphosyntactic transfer for which the literature has so far provided the most support: The L2 Status Factor Hypothesis and the Typological Primacy Model. These models are empirically verifiable as they each take a single factor—namely the L2 status factor and typological proximity—as the primary influence on morphosyntactic transfer between the L1, L2 and L3.

2.3 Dutch, German and English

In the previous chapter, different models of L3 morphosyntactic transfer and various types of transfer factors were discussed. With the language combination for L3 Dutch in the German and English language areas we have an excellent situation for testing the two models of L3 morphosyntactic transfer for which the literature has so far provided the most support, that is, the L2 Status Factor Hypothesis and the Typological Primacy Model. We therefore investigate morphosyntactic transfer into the L3 in learners of L3 Dutch with L1 German and L2 English, as well as learners of L3 Dutch with L1 English and L2 German. The following section gives an overview of the international status of Dutch as a foreign language, and the distribution of Dutch as a foreign language in the German and English language areas. Furthermore, we examine the typological relationships between Dutch, German, and English, and we report findings on the psychotypology of learners of Dutch from the German and English language areas.

2.3.1 Dutch in the German and English Language Areas

Dutch has approximately 24 million L1 speakers (Nederlandse Taalunie, n.d.)[4]. At first glance, Dutch might appear to be a minor language, but it ranks among the 40

[4] Eberhard et al. (2022) mention that Dutch has approximately 23 million L1 speakers. However, their sources appear to be partially outdated. For instance, they assume that there are 16 million L1 speakers in the Netherlands, while today's estimate is closer to 17 million (Nederlandse Taalunie, n.d.). The Nederlandse Taalunie (n.d.) points out that figures on the number of Dutch speakers are always based on estimates.

most spoken languages in the world (Nederlandse Taalunie, n.d.)[5]. Against the backdrop of over 7.000 languages worldwide, Dutch is far from being a minor language and is therefore classified as a language with a large speaker population (Eberhard et al., 2022). In Europe, Dutch ranks 10th (Eberhard et al., 2022), and within the European Union, it ranks as high as 8th (Nederlandse Taalunie, n.d.), placing third within the Germanic language family after English and German. L1 speakers of Dutch are mainly found in Europe and the Americas, and Dutch is used as an official or unofficial language in various countries. It is an official language in the Netherlands, including its so-called special municipalities Bonaire, Saba, and Sint Eustatius (collectively referred to as the Caribbean Netherlands), Belgium, and Suriname, as well as in Aruba, Curaçao, and Sint Maarten, which together with the Caribbean Netherlands, comprise the Dutch Caribbean. With its standard varieties Dutch Dutch (i.e., the standard variety in the Netherlands), Belgian Dutch, and Surinamese Dutch, Dutch is considered a pluricentric language (De Belder & Hiemstra, 2023). De Belder and Hiemstra (2023) point out that the Caribbean varieties of Dutch are not officially recognised as standard varieties because Aruba, Curaçao, and Sint Maarten are not members of the Nederlandse Taalunie. This should not be interpreted as a general rejection of the Caribbean varieties as standard varieties of Dutch. Besides the 24 million L1 speakers, there are numerous foreign language speakers of Dutch worldwide. Estimates range from 1.6 million (Eberhard et al., 2022) to five million (Ministerie van Buitenlandse Zaken, n.d.; British Council, 2017). Globally, there are approximately 13,500 students enrolled in various Dutch language courses (Nederlandse Taalunie, 2017, 2018; Louwerse, 2018). A significant portion of these students is located in the German and English language areas. In what follows, we confine our focus to the so-called core of the German and English language areas: Germany, Austria, and Switzerland on one hand, and the United States, Great Britain, Canada, Australia, and New Zealand on the other.

In Germany, there are departments of Dutch Studies at the universities of Berlin (Free University), Duisburg-Essen, Cologne, Münster, and Oldenburg, and Dutch can be studied as a major at all of these universities (Missinne & Hüning, 2019).

[5] Janssens and Marynissen (2011) mention that Dutch ranks 37th. According to *Ethnologue*, Dutch is placed 62nd (Eberhard et al., 2022). Apparently, the ranking by the Nederlandse Taalunie (n.d.) and Janssens and Marynissen (2011) considers macrolanguages (such as Chinese) without their variants. In contrast, the ranking by Eberhard et al. (2022) considers the variants (such as Mandarin, Wu, Cantonese, etc.) without their macrolanguage.

Moreover, approximately 25 German universities offer Dutch courses for their students in their university language centres, and around ten universities of applied sciences (*Fachhochschule*) provide Dutch courses as well. In Austria, following the closure of the Dutch department at the University of Vienna in 2020, students can still take Dutch courses as electives within the German department, while in Switzerland, students at the University of Zurich can take Dutch courses offered within the departments of German and Comparative Germanic Linguistics (Missinne & Hüning, 2019).

In the United States, Dutch courses are offered at Calvin College and the universities of California (Berkeley & Los Angeles), Columbia, Dordt, Indiana, Michigan, Minnesota, North Carolina, Pennsylvania, Texas, Wisconsin, and Yale (Internationale Vereniging voor Neerlandistiek [IVN], n.d.; Dewulf, 2019). Dutch can often be studied here as a major or minor, but is usually chosen as a complement to another subject (Dewulf, 2019). Nonetheless, interest in Dutch in the United States remains significant (Dewulf, 2019), particularly at the University of California, Berkeley, where around 220 students are learning Dutch (Nederlandse Taalunie, 2018).

In Great Britain, Dutch courses are offered at University College London[6], King's College London, and the universities of Southampton, Westminster, Oxford, Leicester, Durham, Sheffield, Newcastle, Glasgow, and Bangor (ALCS, 2018). Note that ALCS (2018) mentions that the universities of Cambridge, Coventry, Edinburgh, Manchester, Nottingham, and York also offer Dutch courses. However, it appears that this is no longer the case. Dutch can be studied as a major at University College London and the University of Sheffield (Louwerse, 2019a). Otherwise, Dutch is typically offered as a complement to another subject. In contrast to the United States, interest in Dutch in Great Britain has been declining for years: The number of Dutch courses has decreased since 2006, as well as the number of staff and students (ALCS, 2006; ALCS, 2018). An exception, however, is Sheffield, where an increase in courses and staff was observed as early as 2006 (ALCS, 2006). This trend could also be observed in later years, along with a slight increase in the number of students (ALCS, 2018; Louwerse, 2019b). Furthermore, nationally, there is an increase in the number of students learning Dutch as a

[6] The Dutch department at the University College London, which celebrated its centenary in 2019 (Louwerse 2019b), no longer exists. Dutch is now part of the Department of European Languages, Culture & Society.

complement to another subject in university language centres (ALCS, 2006; ALCS, 2018).

In Canada, Dutch courses are offered at the universities of Toronto, Waterloo, British Columbia, Calgary, and Victoria, with Dutch usually being offered as a complement to another subject (Verheyen & Collet, 2019). Note that Verheyen and Collet (2019) mention that the University of Winnipeg and Redeemer College in Ancaster also offer Dutch courses. However, it appears that this is no longer the case. Additionally, students at King's University in Edmonton have the opportunity to learn Dutch as part of the exchange program *Going Dutch* (Verheyen & Collet, 2019).

In Australia, the Dutch department at the University of Melbourne was closed in 1992 (Hermans, 1995), and the Dutch course subsequently established at the University of Auckland in New Zealand as an elective within the German department (Hermans, 1995) has since been discontinued (Nederlandse Taalunie, 2018). In Oceania, Dutch language students can now only be found at the University of Queensland (IVN, n.d.). This is mainly due to the declining influx of Dutch-speaking immigrants from Europe and the decreasing interest of their descendants in Dutch (Hermans, 1995). Declining migration flows and disinterest in Dutch are also the reasons why the number of Dutch courses in Canada has decreased since the early 1990s (Hermans, 1995, Verheyen & Collet, 2019). In contrast, in the United States, which was also a destination for Dutch-speaking Europeans, declining migration flows have not resulted in a decrease in the number of Dutch courses (Hermans, 1995).

It becomes clear that Dutch is learned by a significant number of students in the German and English language areas, especially in Germany and the United States, but also in Great Britain and Canada. Moreover, in Germany, Dutch is also taught outside of university education: Approximately 30,000 students in North Rhine-Westphalia and around 8,000 students in Lower Saxony learn Dutch in primary and secondary education (Nederlandse Taalunie, 2020). The number of students has grown significantly in recent years and could have increased even more strongly were it not for a shortage of teachers of Dutch as a foreign language (Nederlandse Taalunie, 2020). Consequently, the Dutch teacher training program in Germany offers very good career prospects (Missinne & Hüning, 2019). Furthermore, Dutch has been an extremely popular language at adult education centres (*Volkshochschule*) for many years, and in 2020, more than 14,500 course participants enrolled in Dutch courses (Echarti et al., 2022).

In the English language area, Dutch is indeed less relevant outside of university education, with only a few public and private schools offering Dutch courses. Nevertheless, in some parts of the English language area, there is as much demand for Dutch as in Germany. According to the British Council (2017), Dutch ranks 7th among the languages that will be crucial for the future prosperity, security, and global influence of Great Britain. Dutch ranks 3rd among the most important languages for British export markets and 4th among the most important languages for international education (British Council, 2017). As for the United States, Dutch ranks 13th among the most important languages for the future (Jain, 2020). Additionally, Dutch ranks 6th most important language in the United States in terms of both export markets and the most popular destinations for travellers (Jain, 2020). Therefore, Dutch has a firm position as an important foreign language in both the German-speaking and English-speaking areas, and we can expect Dutch to continue to be learned there in the future.

2.3.2 Typology and Psychotypology

Dutch belongs to the Indo-European language family, and within this, to the Germanic languages. The Germanic languages are subdivided based on their historical origins into East Germanic (Gothic; extinct), North Germanic (Danish, Faroese, Icelandic, Norwegian, and Swedish), and West Germanic (Afrikaans, German, English, Frisian, Yiddish, Luxembourgish, Low German, Dutch, Pennsylvania German, Plautdietsch) (Harbert, 2006; Müller, 2023). Based on this historical subdivision of the Germanic languages, it can be assumed, that Dutch is closer to the West Germanic languages German and English than to the North Germanic languages Danish and Swedish. As for German and English, although German separated from the other West-Germanic languages as a result of the High German consonant shift from the 6th century onwards (Janssens & Marynissen, 2011), German is generally assumed to be closer to Dutch than English is to Dutch in all language domains (Heeringa et al., 2023). See **Table 2** for the typological proximity between Dutch, German, and English in the linguistic domains of lexicon (measured by percentage of non-cognates), syntax (measured by trigram distance), and phonetics and orthography (measured by percentage of Levenshtein distance).

Table 2: *Typological Proximity between Dutch, German and English in Different Linguistic Domains*

Domain	Languages	Measure	Proximity	Source
lexicon	Dutch-German	% non-cognates	14.0%	Heeringa et al., 2013
lexicon	Dutch-German	% non-cognates	21.5%	Heeringa et al., 2023
lexicon	Dutch-English	% non-cognates	37.0%	Heeringa et al., 2013
lexicon	Dutch-English	% non-cognates	39.0%	Heeringa et al., 2023
syntax	Dutch-German	trigram distance	23.8	Heeringa et al., 2023
syntax	Dutch-English	trigram distance	34.4	Heeringa et al., 2023
phonetics	Dutch-German	% Levenshtein distance	53.3%	Gooskens & Heeringa, 2004
phonetics	Dutch-German	% Levenshtein distance	29.6%	Heeringa et al., 2023
phonetics	Dutch-English	% Levenshtein distance	64.7%	Gooskens & Heeringa, 2004
phonetics	Dutch-English	% Levenshtein distance	33.9%	Heeringa et al., 2023
orthography	Dutch-German	% Levenshtein distance	28.0%	Heeringa et al., 2013
orthography	Dutch-English	% Levenshtein distance	32.0%	Heeringa et al., 2013

According to Van Haeringen (1956), Dutch occupies a middle position between German and English in terms of morphology, and in some respects, Dutch is even closer to English than to German. The middle position of Dutch between German and English was also shown in more recent research (see e.g. Hüning et al., 2006), so that we can conclude that in terms of morphology, Dutch stands roughly halfway between English and German (de Schutter et al., 2005). See also van der Slik et al. (2019) who found that Dutch, German and English have the same morphological complexity scores.

To gain a better overview of the typological relations within the Germanic language family, we also include the North Germanic languages Danish and Swedish at this point. In our study on the psychotypological proximity between Dutch, German and English of German-speaking and English-speaking learners of L3 Dutch, as well as L1 speakers of Dutch, we also investigate what position Danish and Swedish occupy in relation to Dutch, German and English (see **Chapter 4. Psychotypology**). As for Danish and Swedish, Danish generally is closer to Dutch than Swedish is to Dutch, especially in lexical, syntactic and orthographic terms. Only in phonetic terms it is the other way around and Swedish is closer to Dutch than Danish is to Dutch. See **Table 3** for the typological proximity between Dutch, German, and English in the linguistic domains of lexicon (measured by percentage of non-cognates), syntax (measured by trigram distance), and phonetics and orthography (measured by percentage of Levenshtein distance).

Table 3: *Typological Proximity between Dutch, Danish and Swedish in Different Linguistic Domains*

Domain	Languages	Measure	Proximity	Source
lexicon	Dutch-Danish	% non-cognates	17.0%	Heeringa et al., 2013
lexicon	Dutch-Danish	% non-cognates	45.6%	Heeringa et al., 2023
lexicon	Dutch-Swedish	% non-cognates	20.0%	Heeringa et al., 2013
lexicon	Dutch-Swedish	% non-cognates	47.8%	Heeringa et al., 2023
syntax	Dutch-Danish	trigram distance	36.8	Heeringa et al., 2023
syntax	Dutch-Swedish	trigram distance	36.9	Heeringa et al., 2023
phonetics	Dutch-Danish	% Levenshtein distance	63.4%	Gooskens & Heeringa, 2004
phonetics	Dutch-Danish	% Levenshtein distance	39.7%	Heeringa et al., 2023
phonetics	Dutch-Swedish	% Levenshtein distance	60.9%	Gooskens & Heeringa, 2004
phonetics	Dutch-Swedish	% Levenshtein distance	34.5%	Heeringa et al., 2023
orthography	Dutch-Danish	% Levenshtein distance	33.0%	Heeringa et al., 2013
orthography	Dutch-Swedish	% Levenshtein distance	34.0%	Heeringa et al., 2013

The following ranking of the four Germanic languages discussed can thus be assumed with respect to their distance from Dutch:

- Historical ranking:
  Dutch - **German** - **English** - Danish - Swedish

However, this ranking, based on the aforementioned historical subdivision of the Germanic languages, does not seem to reflect the contemporary distance between the Germanic languages. Both Gooskens & Heeringa (2004) and Heeringa et al. (2013) conclude that there is actually a clear gap, in phonological and especially lexical terms, between English and the other Germanic languages. In general, modern English is closer to the North Germanic languages than to its West Germanic neighbours, and the literature is already discussing whether English should be classified as a North Germanic language (Heeringa et al., 2023). The reason for this is not only the geographical distance between the English-speaking area and the European mainland but also the influence of other languages on English, particularly Latin, French, and Scandinavian languages (Van Haeringen, 1956; Gooskens & Heeringa, 2004). The influence of Scandinavian languages is a result of the Viking invasion from the 8th century onwards, and the strong influence of French is a result of the Norman occupation of the British Isles from 1066. Based on more recent comparative studies, the following ranking of the four discussed Germanic languages can thus be assumed especially in lexical terms regarding their distance to Dutch:

- Comparative ranking:
  Dutch - **German** - Danish - Swedish - **English**

As far as we know, there is only one study about the psychotypological proximity between Dutch, German, and English among German-speaking and English-speaking learners of L3 Dutch, namely the study by Vismans and Wenzel (2012). They found that both groups of learners perceive German as closest to Dutch, followed by English in second place. Both German-speaking and English-speaking learners also place the North Germanic languages Danish or Swedish in second place, however, to a lesser extent than English. The tendency to place North Germanic languages in second place is slightly higher for German-speaking learners than for English-speaking learners. However, there is no significant difference between the two groups. In descending order, German-speaking learners place Swedish, Danish, French, and English in third place. English-speaking learners, on the other hand, place Danish, English, Swedish, and to a lesser extent, French, in third place in descending order. In this case, the difference between German-speaking and English-speaking learners is significant (Vismans & Wenzel, 2012).

Vismans and Wenzel (2012) also investigated which factors play a role in assessing typological proximity. In both groups of learners, *vocabulary*, *grammar*, and *sounds* were the most important factors in evaluating the typological proximity between Dutch and the language they placed in first position. Other factors mentioned were *roots* (i.e., origin) for English-speaking learners and *dialect* for German-speaking learners. Factors such as *spelling*, *geography*, and *Romance influence* do not play a major role in the data.

Vismans and Wenzel (2012) also wanted to test the influence of proficiency in L3 Dutch on psychotypology. This seems reasonable, as the perception of typological proximity appears to change with increasing language proficiency (Kellermann, 1986). However, the data from Vismans and Wenzel (2012), was not conducive to an investigation of whether higher language proficiency leads to a change in psychotypology. According to Vismans and Wenzel (2012), the data did not allow for a meaningful classification of the participants based on language proficiency.

In summary, Vismans and Wenzel (2012) found that German-speaking and English-speaking learners of L3 Dutch show a ranking corresponding to the historical subdivision, with German taking the first place, English the second, and

the North Germanic languages Danish and Swedish following. The factors playing a role in this perception are primarily *vocabulary* for both groups of learners, but also *grammar* and *sounds*.

3.3.3 Conclusion

In conclusion, Dutch has around 24 million L1 speakers and up to five million foreign language speakers worldwide, ranking among the top 40 most spoken languages globally. It is officially recognised in several countries, including the Netherlands, Belgium, and Suriname, and exhibits pluricentricity with various standard varieties. Dutch is widely taught in the German and English language areas, with strong academic programs in Germany and notable interest in the United States and Great Britain, despite some declines in the latter. Its strategic importance for education and trade suggests that Dutch will continue to be learned and valued in these regions.

Typologically, Dutch belongs to the West Germanic branch of the Indo-European language family, alongside, for example, German, English, Danish, and Swedish. Historically, German is closest to Dutch, followed by English, Danish and Swedish. However, contemporary studies reveal a significant lexical gap between English and the other Germanic languages. Psychotypologically, according to Vismans and Wenzel (2012), both German-speaking and English-speaking learners of L3 Dutch perceive German as the closest language to Dutch, followed by English, Danish and Swedish. Thus, they show a ranking corresponding to the historical subdivision. Factors influencing these perceptions include *vocabulary*, *grammar*, and *sounds*, while factors such as *roots* and *dialects* also play roles in learners' assessment of typological proximity.

CHAPTER 3. SUPERLATIVES AND TWO-VERB CLUSTERS

In this research, we used Dutch superlatives and two-verb clusters to investigate morphosyntactic transfer between L1 German/English, L2 English/German and L3 Dutch. Both linguistic properties have two optional variants in Dutch, whereas German and English each allow for only one. The choice of linguistic properties enables us to test the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) and the Typological Primacy Model (Rothman, 2011, 2015) against each other. Since both the L1 property (German/English) and the L2 property (English/German) are grammatical in the L3 (Dutch), we can rule out that L3 learners of Dutch avoid either property on the basis of ungrammaticality.

3.1 Superlatives

In Dutch, German and English, adjectives have three degrees of comparison: positive (*natural*), comparative (*more natural*), and superlative (*most natural*). This study focusses on the formation of superlatives. In addition, adjectives can be used in three functions: attributive (*the natural apple*), predicative (*the apple is natural*) and adverbial (*the apple grows naturally*)[7]. Attribute adjectives are in prenominal position, whereas predicative and adverbial adjectives are in postnominal position. This study focusses on the formation of superlatives of attributive adjectives in prenominal position (*the natural apple*) and on predicative adjectives in postnominal position (*the apple is natural*). With regard to the formation of such superlatives, there are theoretically two possibilities: inflection (adding suffix *-st* (Dutch & German) or *-est* (English)) and periphrasis (adding intensifier *meest* (Dutch) or *most* (English)). The former is referred to as the morphological

[7] Note that adjectives and adverbs, although "more alike than any other pair of part-of-speech categorie [*sic*]" (Huddleston & Pullum, 2002, p. 527), are not the same: "The primary syntactic distinction … is between adjectives, which modify only nouns, and adverbs, which modify all the other categories – verbs, adjectives, prepositions, determinatives, and other adverbs" (Huddleston & Pullum, 2002, p. 526).

superlative (also called synthetic/affixal form), the latter as the syntactic superlative (also called analytic/periphrastic from).

Before going into the language-specific details, examples (**3**) to (**5**) show the possibilities and impossibilities of the formation of superlatives with the adjective *natural* in Dutch, German and English.

3. Dutch
   a. morphological superlative: *de **natuurlijk-st-e** appel*
   b. syntactic superlative: *de **meest natuurlijk-e** appel*

4. German
   c. morphological superlative: *der **natürlich-st-e** Apfel*
   d. syntactic superlative: **der **meist natürlich-e** Apfel*

5. English
   e. morphological superlative: **the **natural-est** apple*
   f. syntactic superlative: *the **most natural** apple*

In Dutch, superlatives are generally formed morphologically by adding the suffix *-st* to the positive (Haeseryn et al., 1997a; Booij, 2019). Thus, the superlative of *natuurlijk* (*natural*) is *natuurlijk-st* (**natural-est*). Although the morphological form of the superlative is considered to be the standard form in Dutch, some superlatives can or must be formed syntactically. The syntactic superlative is formed by adding the intensifier *meest* (*most*) in front of the positive (Booij, 2019) and the superlative of *natuurlijk* (*natural*) can also be *meest natuurlijk* (*most natural*)[8]. Relevant to this study are superlatives that can be formed both syntactically and morphologically. The syntactic superlative receives less attention in the literature and studies investigating the distribution between the morphological superlative and the syntactic superlative are scarce. In a corpus study, using the *Corpus of Spoken Dutch*, Karsdorp and Beekhuizen (2010) found that the general distribution between morphological and syntactic superlatives is

[8] To be complete, in Dutch, the form of attributive adjectives, which are in prenominal position, depends on the number, gender and definiteness of the head of their NP: If the NP shows the features singular, feminine/masculine/neuter and definite, as in *de natuurlijk-st-e appel* / *de meest natuurlijk-e appel* (*the most natural apple*), the suffix *-e* is added to the adjective (Booij, 2019).

89.64% for morphological superlatives and 10.36% for syntactic superlatives at the level of tokens, however, at the level of types, the distribution between morphological superlatives and syntactic superlatives is approximately fifty-fifty. Investigating the influence of the number of syllables on the choice between the morphological superlative and the syntactic superlative, Karsdorp and Beekhuizen (2010) found more pronounced differences regarding the distribution of morphological superlatives and syntactic superlatives. **Table 4** shows the frequency of morphological and syntactic superlatives in the *Corpus of Spoken Dutch* by the number of syllables of the adjective.

Table 4: *Frequency of Morphological and Syntactic Superlatives in the Corpus of Spoken Dutch by Nnumber of Syllables of Adjectives (Karsdorp and Beekhuizen, 2010)*

number of syllables	morphological superlative	syntactic superlative
1	81.32%	18.68%
2	50.00%	50.00%
3	31.91%	68.09%
4	18.18%	81.82%
5	0.00%	100.00%

Using the *Corpus of Contemporary Dutch*, Kiers (2014) found in written Dutch that the distribution between morphological and syntactic superlatives is 90.52% for morphological superlatives and 9.48% for syntactic superlatives. Kiers (2014) assumes that English has influenced Dutch in terms of the syntactic superlative and argues that under the continued influence of English, the domain of the syntactic superlative will become larger in Dutch. Karsdorp and Beekhuizen (2010) conclude that in this respect Dutch lies between German and English.

According to Karsdorp and Beekhuizen (2010), the two superlatives have very similar functions and it is not clear what the difference is between the two or what factors determine the choice between a morphological and a syntactic superlative. It is said that there is an increasing tendency that adjectives with three or more syllables prefer the syntactic superlative (Haeseryn et al., 1997b). Karsdorp and Beekhuizen (2010) found the same (see **Table 4**). However, not all trisyllabic/polysyllabic adjectives take both the morphological and the syntactic superlative to the same extent. Adjectives with suffixes *-st*, *-sd*, *-s*, *-isch*, *-sk* or *-de* prefer the syntactic superlative (Haeseryn et al., 1997b), probably in order to "avoid awkward phonetic clusters" (Audring, 2015, Expression of degree section). Thus, in cases where adjectives become more complex due to an increased number of

syllables, or in cases where adjectives have a final sound that does not go well with the morphological superlative marker *-st*, due to a combination of sounds difficult to pronounce (e.g., ?*de fantastisch-st-e appel* (*the most fantastic apple*)), the syntactic superlative offers a solution. The syntactic form of the superlative is also exclusively used in relation to participial adjectives, for emphasis, or when two particulars of the same quantity are compared with each other (Haeseryn et al., 1997b). The latter cases are not relevant to this study; however, they at least contribute to the syntactic superlative's common usage in Dutch. Finally, stylistic factors might also play a role in the choice between the morphological superlative and syntactical superlative, as proposed by Hüning (2020).

In German, superlatives are generally formed morphologically by adding the suffix *-st* to the positive (Eisenberg, 2020). Thus, the superlative of *natürlich* (*natural*) is *natürlich-st* (**natural-est*)[9]. The syntactic superlative as in **meist natürlich* (*most natural*) is not grammatical in German. However, observations from spontaneous language production suggest that, although ungrammatical (Eisenberg, 2020), the syntactic comparative *mehr natürlich* (*more natural*) seems to be available in German. For example, a participant in a yoga class said *Diese Woche war nicht mehr anstrengend, als andere Wochen* (*This week has not been more exhausting than other weeks*). An influence of English seems to be apparent here. However, observations like this are anecdotal and, to our knowledge, no studies investigating the use of the syntactic comparative—and superlative—in German have been published at the time of writing this dissertation.

In English, superlatives can be formed in two ways: firstly, morphologically by adding the suffix *-est* to the positive; secondly, syntactically by adding the intensifier *most* in front of the positive (Bauer et al., 2013). English adjectives show both the morphological and syntactic form of superlative formation, however, the syntactic superlative is used to a much higher degree (Karsdorp & Beekhuizen, 2010). The choice between morphological and syntactic superlative formation is thought to be determined by various different factors (e.g., Mondorf, 2009; Bauer et al., 2013; Cheung & Zhang, 2016). Cheung and Zhang (2016) argue that the syllable number of the adjective is the most important factor influencing the choice

[9] To be complete, in German, the form of attributive adjectives, which are in prenominal position, depends on the case, number, gender and definiteness of the head of their NP: If the NP shows the features nominative, singular, feminine/masculine/neuter and definite, as in *der natürlich-st-e Apfel* (*the most natural apple*), the suffix *-e* is added to the adjective (Eisenberg, 2020).

between morphological and syntactic superlative. Monosyllabic adjectives typically take the morphological form, disyllabic adjectives vary between the morphological and syntactic from, and trisyllabic/polysyllabic adjectives only take the syntactic form (Bauer et al., 2013). Thus, the superlative of *natural* is *most natural*. However, unlike in German, both the morphological superlative and the syntactic superlative are generally available in English. For comparatives, Mondorf (2009) suggests that using the syntactic comparative reduces the cognitive effort needed during language processing, which is a compensatory method referred to as *more-support*. The syntactic comparative is believed to be particularly effective in situations with higher processing complexity because it aids in early recognition of phrase structure and has a clearer relationship between form and function. Moreover, it is assumed that the intensifier *more* serves as a structural signal predicting cognitive complexity. Cheung and Zhang (2016) investigated whether Mondorf's claims can be extended to superlatives and found indications that the syntactic superlative also acts as a support strategy reducing processing load, indicating *most-support*.

To sum up, In Dutch, superlatives of trisyllabic and polysyllabic adjectives can be formed both morphologically and syntactically, however, the two forms are not equally optional. Different factors determine the use of one or the other. In German and English, on the other hand, superlatives are formed morphologically in German and—with regard to trisyllabic and polysyllabic adjectives—syntactically in English. Thus, Dutch, lies between its Germanic sisters German and English, supporting the idea of Dutch being a *Germanic Sandwich* (van Haeringen, 1956; Hüning et al., 2006; van der Wouden, 2012). This makes superlatives a suitable testing ground to investigate the influence of the L1 and the L2 on the L3 in learners of L3 Dutch with L1 German and L1 English.

3.2 Two-Verb Clusters

A verb cluster is a string of verbs clustering together at the second/right verbal pole (e.g., Haeseryn et al., 1997c). Two-verb clusters in present perfect declarative subordinate clauses contain a finite and a non-finite verb (i.e., participle). In the literature, the finite verb is often indicated with 1 and the participle with 2, representing the hierarchical order (i.e., deep structure) of the verbal elements (Wurmbrand, 2006), and logically there are two possible word orders: 1-2 (i.e., finite verb – participle) and 2-1 (i.e., participle – finite verb). These are also

described as ascending order or red word order for 1-2, and descending order or green word order for 2-1 (e.g., Zwart, 2011; Pauwels, 1953). Since we use auxiliaries in the finite verb position, we refer to 1-2 with *Auxiliary-Participle* and to 2-1 with *Participle-Auxiliary*. Regarding word order within two-verb clusters, German, English and Dutch, like many other Germanic languages, show considerable differences. See Wurmbrand (2004) for an overview on word order variation within verb clusters in West Germanic languages. Before going into the language-specific details, examples (**6**) to (**8**) show the possibilities and impossibilities of the word order of two-verb clusters in subordinate clauses with the participle *dreamed* and the auxiliary *have* in Dutch, German and English.

6. Dutch
   a. Participle-Auxiliary: …*dat hij* ***gedroomd heeft***
   b. Auxiliary-Participle: …*dat hij* ***heeft gedroomd***

7. German
   a. Participle-Auxiliary: …*dass er* ***geträumt hat***
   b. Auxiliary-Participle: *…*dass er* ***hat geträumt***

8. English
   a. Participle-Auxiliary: *…*that he* ***dreamed has***
   b. Auxiliary-Participle: …*that he* ***has dreamed***

In German, word order in two-verb clusters is Participle-Auxiliary, by default (Bader & Schmid, 2009). In English, on the other hand, word order in two-verb clusters is Auxiliary-Participle, by default (Bloem et al., 2017)[10]. In Dutch, however, word order in two-verb clusters can be either Participle-Auxiliary or Auxiliary-Participle (Zwart, 2011; Bloem et al., 2017; van Craenenbroeck et al., 2019). As with the superlatives, in this respect Dutch lies between German and English; yet another phenomenon supporting the idea of Dutch being a *Germanic*

[10] In English, verbs groups are not called *verb clusters*, since the can be interrupted by non-verbal material (Bloem et al., 2017). However, for reasons of simplicity, and because this property of English verb groups is not relevant to this dissertation, we use the term *verb cluster* also for English.

Sandwich[11]. It is argued that the choice between Participle-Auxiliary and Auxiliary-Participle is not determined by grammatical factors, and that language users can choose between these word order possibilities, which are both considered to be grammatical and do not differ in meaning (Haeseryn et al., 1997c; Bloem et al., 2017). The use of either Participle-Auxiliary or Auxiliary-Participle is determined by individual, geographical, stylistic and also rhythmic factors[12] (Haeseryn et al., 1997c), and there are numerous studies investigating the distribution between Participle-Auxiliary and Auxiliary-Participle in Dutch. We summarise the most important findings. See, for example, Coussé et al. (2008), for a detailed discussion on factors influencing the choice between Participle-Auxiliary and Auxiliary-Participle.

In the literature, with regard to stylistic variation, the primary distinction drawn is between spoken and written Dutch, and there are clear differences in the choice between Participle-Auxiliary and Auxiliary-Participle in the two registers: Participle-Auxiliary is more dominant in spoken Dutch, especially in informal spoken Dutch, and Auxiliary-Participle is more dominant in written Dutch (Haeseryn et al., 1997c). In a corpus study, using the *Corpus of Spoken Dutch*, Stroop (2009) found that the distribution between Participle-Auxiliary and Auxiliary-Participle is 63.0% Participle-Auxiliary to 37.0% Auxiliary-Participle in spoken Dutch, and in a corpus study, using the *38 Million Word Corpus*, Arfs (2007) found 27.9% Participle-Auxiliary to 72.1% Auxiliary-Participle in written Dutch. However, De Sutter (2005) found in a corpus study, using the *CONDIV-Corpus of Written Dutch*, and the *Corpus of Spoken Dutch*, that the distribution between Participle-Auxiliary and Auxiliary-Participle is approximately fifty-fifty in spoken Dutch. In written Dutch, however, the distribution between Participle-Auxiliary and Auxiliary-Participle is 33.3% Participle-Auxiliary to 66.7% Auxiliary-Participle (De Sutter, 2005). The extent to which Participle-Auxiliary is used in spoken Dutch is considered not to be the same in all parts of the language

[11] We also find this sandwich pattern in 3-verbs clusters. In English, word order in 3-verb clusters is 1-2-3 (modal verb – non-finite verb – participle, or MOD_AUX_PART); in German word order in 3-verb clusters is 3-2-1 (participle – non-finite verb – modal verb, or PART_AUX_MOD) (Wurmbrand, 2006). In Standard Dutch, we find MOD_AUX_PART (1-2-3) and in Dutch dialects in the northern parts of the Netherlands, we find PART_AUX_MOD (3-2-1) (Wurmbrand, 2006; Barbiers et al., 2008). However, in Standard Dutch, we also find MOD_PART_AUX (1-3-2) and PART_MOD_AUX (3-1-2); and in German dialects, also MOD_PART_AUX is possible (Wurmbrand, 2006; van Craenenbroeck et al., 2019).

[12] Since rhythmic factors are less important in written texts (Bloem et al., 2017), we do not discuss these.

area (Haeseryn et al., 1997c). This is a possible explanation for De Sutter's (2005) results. However, in the *SAND project* on word order variation within verb clusters in Dutch dialects, Barbiers et al. (2008) found in oral interviews that overall Participle-Auxiliary is the dominant word order in the entire European Dutch language area (i.e., the Netherlands, Belgium and Northern France). Auxiliary-Participle is mainly present—next to Participle-Auxiliary—in the central (i.e., the north-eastern and southern parts of the Netherlands and Northern Belgium) and south-eastern (i.e., Eastern Belgium) part of the European Dutch language area (Barbiers et al., 2008).

The asymmetry between Participle-Auxiliary and Auxiliary-Participle we find with regard to spoken versus written Dutch, we also find with regard to informal versus formal Dutch. Auxiliary-Participle is more dominant in formal Dutch, especially in journalistic texts (Haeseryn et al., 1997c). Haeseryn et al. (1997c) note that there is a widespread misunderstanding that Auxiliary-Participle is to be preferred over Participle-Auxiliary. For instance, the use of Participle-Auxiliary has long been discouraged in style sheets for journalistic texts, as sounding 'too German' (Stroop, 1970). See also De Sutter (2005), who found that the more editorial control, the higher the use of Auxiliary-Participle. This seems to have been less the case in general grammars and stylesheets: In a corpus of 76 grammars and 89 stylesheets from the 20th century and early 21st century, De Sutter (2005) found that the variation within two-verb clusters is mentioned in half of the grammars and in one-third of the stylesheets, and that neither variant is disapproved, although sporadically a preference is expressed for either Participle-Auxiliary or Auxiliary-Participle. Moreover, De Sutter (2005) found that the distribution between two-verb clusters is 59.1% Participle-Auxiliary to 40.9% Auxiliary-Participle in informal Dutch, and 28.8% Participle-Auxiliary to 71.2% Auxiliary-Participle in formal Dutch, thus confirming the common view in the literature. The preference of Auxiliary-Participle in formal Dutch is explained by an anti-dialect reflex: Participle-Auxiliary is the most widespread in the dialects (see Barbiers et al., 2008), which leads to Auxiliary-Participle being perceived as the prestigious form and Participle-Auxiliary as the stigmatised form (De Sutter, 2005).

In more recent studies on the distribution of Participle-Auxiliary and Auxiliary-Participle, processing is considered as an influencing factor in the choice between Participle-Auxiliary and Auxiliary-Participle. Currently, there are two opposing positions. Firstly, De Sutter (2005) argues that Participle-Auxiliary is easier to process because it is used more frequently in communication situations in which

the pressure to produce is greater due to a lack of time or resources (i.e., spoken rather than written, informal rather than formal, spontaneous rather than edited). Based on this, he suggests that Participle-Auxiliary is the default, more economical order in two-verb clusters. De Sutter (2005) further argues that numerous studies have found that Participle-Auxiliary is dominant in Dutch dialects, leading to the conclusion that Participle-Auxiliary, which is most often used in the most basic language variety for the most basic communication situations, is more entrenched in the mental grammar[13] and, thus, the default. Auxiliary-Participle, on the other hand, is considered to be marked and only replaces Participle-Auxiliary in circumstances where production pressure is low or absent, thus, when there is plenty of time and there are enough resources to produce Auxiliary-Participle. According to De Sutter (2005), Auxiliary-Participle is marked, since the attention is drawn to the participle of the two-verb cluster. In addition, Zuckerman (2001) found that children under the age of five use Participle-Auxiliary to a greater extent than Auxiliary-Participle, which leads De Sutter (2005) to conclude that children acquire Participle-Auxiliary first and, thus, that Participle-Auxiliary is the default order.

On the other hand, Meyer and Weerman (2016) argue that children initially do not recognize verb clusters as verb clusters, and that Participle-Auxiliary in children can only be seen as a representation of the underlying object-verb (OV) word order in Dutch. When encountering Auxiliary-Participle in the input, children analyse Auxiliary-Participle as two-verb clusters to save their OV analysis (Meyer & Weerman, 2016). Children then gradually apply this analysis to all two-verb clusters, changing their analysis from a construction-specific rule to a general rule where Auxiliary-Participle is the preferred order for all two-verb clusters (Meyer & Weerman, 2016). Bloem et al. (2017) argue that this might mean that Auxiliary-Participle is more entrenched in the mental grammar and is therefore easier to process, and that it is generally assumed that more entrenched elements are easier to process. However, Meyer and Weerman (2016) do not provide a definitive answer to the question of how children move from an Auxiliary-Participle preference to an adult-like distribution of two-verb clusters. Bloem et al. (2017) tested different factors of word order variation within two-verb clusters which they

[13] "*Entrenchment* is a fundamentally cognitive notion, referring to the degree to which a linguistic structure of any degree of complexity or schematicity forms an established unit of the mental grammar of a speaker." (Stefanowitsch & Flach, 2017, p. 101, emphasis by the authors)

linked to processing complexity. Using the *Lassy Large Corpus of Written Dutch*, for most factors Bloem et al. (2017) found Auxiliary-Participle in contexts that are more difficult to process, and Participle-Auxiliary in contexts that are less difficult to process, supporting the Auxiliary-Participle default hypothesis as proposed by Meyer and Weerman (2016). Based on this, Bloem et al. (2017) argue that Auxiliary-Participle is the more entrenched word order in standard Dutch and more easily activated in communication situations with higher processing complexity.

To sum up, in Dutch, word order in two-verb clusters can be both Participle-Auxiliary and Auxiliary-Participle, however, the two forms are not equally optional. Different factors determine the use of one or the other. For German and English, on the other hand, word order in two-verb clusters can only be Participle-Auxiliary in German and Auxiliary-Participle in English. Thus, Dutch, lies between German and English, supporting the idea of Dutch being a *Germanic Sandwich* (van Haeringen, 1956; Hüning et al., 2006; van der Wouden, 2012). This makes two-verb clusters—like superlatives—a suitable testing ground to investigate the influence of the L1 and the L2 on the L3 in learners of L3 Dutch with L1 German and L1 English.

3.3 Item Selection: Groningen Twitter Corpus

Based on the linguistic background, we selected twelve superlatives and twelve two-verb clusters to create test items for our experimental tasks. For this purpose, we used the n-gram frequency database of the *Groningen Twitter Corpus* (Bouma, 2015). The *Groningen Twitter Corpus* is an indexed version of the *Dutch Twitter Corpus* by the University of Groningen that allows interactive queries to be run via a web interface. The *Groningen Twitter Corpus* contains Dutch tweets from the social media service *Twitter* and covers a period from January 2011 to December 2014. The number of collected tweets varies between 0.5 million and 1.5 million tweets per day. After cleaning and filtering (i.e., removing retweets and duplicates, and filtering non-Dutch tweets), and tokenising the data (see Bouma (2015) for detailed information on creating the n-gram frequencies database), it contains almost 2.7 billion tweets and 29 billion tokens. The *Groningen Twitter Corpus* includes n-grams up to a length of five words. A frequency cut-off of ten is applied, meaning that an n-gram has to appear at least ten times to be included in the n-gram frequency database of the *Groningen Twitter Corpus*.

We based item selection on the *Groningen Twitter Corpus* for the following reasons: On the one hand, it allowed us to select superlatives and two-verb clusters that not only allow for both morphological and syntactic superlatives and Participle-Auxiliary and Auxiliary-Participle for two-verb clusters in Dutch, but are actually produced in both variants by speakers of Dutch. The *Groningen Twitter Corpus* contains tweets from a large number of speakers of Dutch and accordingly presents a cross-section of speakers of Dutch. On the other hand, it enabled us to select superlatives and two-verb clusters that are used in informal, spontaneous Dutch. In contrast to formal text types such as newspapers, novels etc., tweets are not edited and represents spontaneously produced language. The *Groningen Twitter Corpus* thus reflects the current productivity of the linguistic properties at hand, and this productivity is reflected in the test items used in the present study.

3.3.1 Superlatives

From the *Groningen Twitter Corpus*, we created a list of the 500 most frequent syntactic superlatives with attributive adjectives used in prenominal position (*the natural apple*). The search pattern was *de meest* * (*the most* *) which was entered under *N-grams* → *Frequencies* (see https://www.let.rug.nl/gosse/Ngrams/). Thus, trigrams, a group of three consecutive words, were searched for, which in this case consisted of the definite article *de* (*the*) and the intensifier *meest* (*most*) plus one additional word, indicated by the asterisk. We further specified that the first 500 tri-grams with a frequency cut-off of ≥ 10 (i.e., the lowest possible cut-off) are displayed.

After compiling a list of the 500 most frequent syntactic superlatives, we applied further criteria to select superlatives to create the superlative test items. These criteria are described below. In addition, after each criterion applied, the number of tri-grams excluded and the number of tri-grams still available for the next step of the item selection process are displayed.

- We excluded all tri-grams including words other than adjectives, as well as those including hashtags, punctuation marks and numbers. Examples are *de meest onzin* (*the most nonsense*), *de meest #belachelijke (the most #ridiculous*), *de meest ...* (*the most ...*) and *de meest 25* (*the most 25*). Forty-nine tri-grams were excluded and 451 tri-grams remained. For the sake of clarity, we also excluded all tri-grams including participle adjectives (see **3.1 Superlatives**).

Examples are *de meest gelezen* (*the most read*) and *de meest getalenteerde* (*the most talented*). As a result, 15 tri-grams were excluded and 436 tri-grams remained.

- We excluded all tri-grams including adjectives consisting of less than three syllables in the uninflected form in Dutch (see **3.1 Superlatives**). Examples are *de meest extreme* (*the most extreme*) and *de meest vrolijke* (*the most happy*). As a result, 207 tri-grams were excluded and 229 tri-grams remained.

- We excluded all tri-grams including adjectives with grammatical errors and/or misspellings. On the one hand, this concerned grammatical errors with regard to inflection (see **3.1 Superlatives**). Examples are **de meest flexibel* (*the most flexible*) and **de meest seksueel* (*the most sexual*). On the other hand, this concerned typos. Examples are **de meest efficiente* (*the most efficient*) and **de meest depresieve* (*the most depressive*). As a result, 13 tri-grams were excluded and 216 tri-grams remained.

- We excluded all tri-grams including adjectives which do not occur in the Dutch online dictionary *Van Dale* (Van Dale Uitgevers, 2022). The aim of this was to exclude adjectives foreign to Dutch, especially recent loanwords from English, which could otherwise lead to an unwanted activation of the L1 or L2. This was only true for *de meest underrated* (*the most underrated*). Thus, one tri-gram was excluded and 215 tri-grams remained.

- We excluded all tri-grams including adjectives which did not have cognates in both German and English. If one language has a cognate (i.e., "words … which are directly descended from a single ancestral form in the single common ancestor of the languages in which the words … are found, with no borrowing" (Trask, 2000, p. 62) while the other language does not, this could result in a transfer advantage for the language with the cognate. Examples are *de meest bijzondere* (*the most special*; *bijzonder* (DUT) – *besonders* (GER) – *special* (ENG)) and *de meest succesvolle* (*the most successful*; *succesvol* (DUT) – *erfolgreich* (GER) – *successful* (ENG)). As a result, 120 tri-grams were excluded and 95 tri-grams remained.

- We excluded all tri-grams including adjectives with less than three syllables in their German and English translation. Again, the aim of this was to avoid unwanted transfer effects. The reason is also because disyllabic adjectives allow for the morphological superlative in English (see **3.1 Superlatives**). Examples are *de meest racistische* (*the most racist*; *racistisch* (DUT) – *rassistisch* (GER) – *racist* (ENG)) and *de meest vriendelijke* (*the most friendly*; *vriendelijk* (DUT) – *freundlich* (GER) – *friendly* (ENG)). As a result, 16 tri-grams were excluded and 80 tri-grams remained.

- We excluded all tri-grams including adjectives with the suffixes *-isch*, *-s* and *-st*. (see **3.1 Superlatives**) Examples are *de meest fantastische* (*the most fantastic*), de meest serieuze (the most serious) and *de meest enthousiaste* (*the most enthusiastic*). For the sake of completeness, there were no tri-grams including adjectives with the suffixes *-sd*, *-sk* and *-de* left in the list at this point, which would otherwise have been excluded (see **3.1 Superlatives**). As a result, 21 tri-grams were excluded and 58 tri-grams remained.

- We excluded all tri-grams including adjectives not appearing in the top 5,000 words of the Hazenberg and Hulstijn list (H&H-list, Hazenberg & Hulstijn, 1996[14]). This was done to ensure that all participants, including German-speaking and English-speaking learners of Dutch, very likely know the adjectives selected for the test items. Lack of knowledge of the adjective selected could influence experimental result. As a result, 31 tri-grams were excluded and 27 tri-grams remained.

- We used the adjectives of the remaining 27 tri-grams containing syntactic superlatives to form the respective morphological superlatives. We then determined the frequencies of the 27 morphological superlatives in the *Groningen Twitter Corpus* and compared them to the frequencies of the 27 syntactic superlatives. In order to do so, the morphological superlatives were entered one by one under *N-grams → Frequencies* (see https://www.let.rug.nl/gosse/Ngrams/). In this case, bi-grams, a group of two

[14] Hazenberg and Hulstijn compiled a list of 23,500 words in total. According to the authors, "non-native speakers might be sufficiently equipped for university entry with a vocabulary of only 5,000 words" (Hazenberg & Hulstijn, 1996, p. 147).

consecutive words, were searched for, which consist of the definite article *de* (*the*) and the inflected adjective (e.g., *natuurlijkste*). Firstly, we excluded all tri-grams which do not have a morphological version of the superlative in the *Groningen Twitter Corpus*. As a result, four tri-grams were excluded and 23 tri-grams remained. Then the difference in frequency between the morphological superlatives and the syntactic superlatives was calculated. The idea was to only select adjectives which are balanced regarding the number of morphological superlatives and syntactic superlatives in the *Groningen Twitter Corpus*. For example, the difference in frequency between *de meest emotionele* (*the most emotional*, frequency: 230) and *de emotioneelste* (*the *emotionalest*, frequency: 89) is 141. We excluded all pairs of n-grams that have a difference in frequency higher than 700. This is an arbitrary threshold drawn for pragmatic reasons. As a result, seven tri-grams were excluded and 16 tri-grams remained.

- In a last step, we used the adjectives of the remaining 16 tri-grams to form syntactic superlatives and morphological superlatives with the definite article *het* (*the*, neuter) instead of the definite article *de* (*the*, feminine/masculine). We then determined the frequencies of both the syntactic superlatives and morphological superlatives with the definite article *het* (*the*) in the *Groningen Twitter Corpus* and compared them to each other. In order to do so, the syntactical superlatives and the morphological superlatives were entered one by one under *N-grams* → *Frequencies* (see https://www.let.rug.nl/gosse/Ngrams/). Thus tri-grams (e.g., *het meest natuurlijke*) and bi-grams (e.g., *het natuurlijkste*) were entered. Firstly, we excluded all tri-grams which do not have a morphological and/or syntactical version of the superlatives with *het* (*the*) in the *Groningen Twitter Corpus*. As a result, four tri-grams were excluded and 12 tri-grams remained. Then, the difference in frequency between the morphological superlatives and the syntactic superlatives with *het* (*the*) was calculated. We did this in order to only select adjectives which are balanced regarding the number of morphological superlatives and syntactic superlatives with both *de* (*the*) and *het* (*the*) in the *Groningen Twitter Corpus*. For example, the difference in frequency between *het meest emotionele* (*the most emotional*, frequency: 113) and *het emotioneelste* (*the *emotionalest*, frequency: 57) is 56. Again, we excluded all pairs of tri-grams that have a difference in frequency higher than 700, due to the same reasons mentioned above. None of the remaining tri-grams had to be

excluded, so that twelve tri-grams remained for the creation of the superlative test items.

Table 5 shows the twelve adjectives selected on the basis of the criteria described above and used to create the superlative test items. The final result includes seven trisyllabic adjectives and five quadrisyllabic adjectives, not including the suffix *-e* added to the adjective (see **3.1 Superlatives**).

Table 5: *Adjectives for the Creation of Superlative Tetst Items (Groningen Twitter Corpus)*

tri-gram (*de meest* *) (*the most* *)	freq. ADJ H&H-list	*de meest ADJ-e* / *de ADJ-st-e*			*het meest ADJ_e* / *het ADJ-st-e*		
		freq. SUP_SYN	freq. SUP_MOR	diff. <= 700	freq. SUP_SYN	freq. SUP_MOR	diff. < 700
emotionele	0001-2000	230	89	141	113	57	56
natuurlijke	0001-2000	220	47	173	74	11	63
negatieve	0001-2000	208	77	131	94	69	25
persoonlijke	0001-2000	148	51	97	89	24	65
intelligente	2001-3000	767	549	218	142	183	41
opmerkelijke	2001-3000	683	509	174	232	110	122
ongelukkige	2001-3000	244	336	92	48	152	104
agressieve	2001-3000	221	150	71	28	38	10
intensieve	2001-3000	147	33	114	44	14	30
creatieve	3001-4000	964	598	366	207	142	65
originele	4001-5000	2,647	1,958	689	474	597	123
sympathieke	4001-5000	586	791	205	46	71	25

3.3.2 Two-Verb Clusters

After selecting superlatives for the superlative test items, we selected verbs for the two-verb cluster test items. From the *Groningen Twitter Corpus*, we created a list of the 2,500 most frequent two-verb clusters with first the auxiliary followed by the participle. The search pattern was *heeft* * (*has* *) which was entered under *N-grams* → *Frequencies* (see https://www.let.rug.nl/gosse/Ngrams/). Thus, bi-grams, a group of two consecutive words, were searched for, which in this case consisted of the auxiliary *heeft* (*has*) plus one additional word, indicated by the asterisk. We further specified that the first 10,000 bi-grams with a frequency cut-off of ≥ 10 (i.e., the lowest possible cut-off) are displayed. The first 2,500 bi-gram

of those 10,000 bi-grams were then selected for the list of the 2,500 most frequent two-verb clusters.

After compiling a list of the 2,500 most frequent two-verb clusters, we applied further criteria to select verbs to create the two-verb cluster test items. These criteria are described below. In addition, after each criterion applied, the number of bi-grams excluded and the number of bi-grams still available for the next step of the item selection process are displayed.

- We excluded all bi-grams including words other than participles, as well as those including hashtags, punctuation marks, numbers and emojis. Examples are *heeft een* (*has a*), *heeft geen (has no*) and *heeft vandaag* (*has today*), *heeft Twitter* (*has Twitter*), *heeft #vacature* (*has #vacancy*) *heeft ...* (*has ...*), *heeft 19* (*has 19*), *heeft* ☺ (*has* ☺) to name just a few of the many examples. 2,070 bi-grams were excluded and 430 bi-grams remained.

- We excluded all bi-grams including participles beginning with prefixes other than the prefix *ge-* which is the standard prefix in Dutch participles. 207 bi-grams were excluded and 223 bi-grams remained.

- We excluded all bi-grams including participles with grammatical errors and/or misspellings. Most often, this concerned the malformation of the participle through the use of the suffix *-t* instead of the suffix *-d* at the end of the participle, which is a common error in Dutch. Examples are **heeft gezegt* (*has said*) and **heeft gedroomt* (*has dreamed*). As a result, 26 bi-grams were excluded and 197 bi-grams remained.

- We checked whether all bi-grams including participles occur in the Dutch online dictionary *Van Dale* (Van Dale Uitgevers, 2022). This was true for all remaining bi-grams. Thus, zero bi-grams were excluded and 197 bi-grams remained. However, at this point we decided to exclude the bi-gram *heeft geclosed* (*has closed*). According to *Van Dale* (Van Dale Uitgevers, 2022) the participle *geclosed* (*closed*) indeed exists in Dutch. Nevertheless, the English suffix *-ed* could lead to an unwanted activation of English. Thus, one bi-gram was excluded and 196 bi-grams remained.

- For the same reasons as for the superlatives (see **3.3.1 Superlatives**), we excluded all bi-grams including participles which did not have cognates in both German and English. Examples are *heeft gefeliciteerd* (*has congratulated*; *feliciteren – gratulieren –* to *congratulate*) and *heeft gekocht* (*has bought*; *kopen – kaufen – to buy*). As a result, 107 bi-grams were excluded and 89 bi-grams remained.

- We excluded all bi-grams including participles that cannot be used intransitively. This was due to the syntactic structure of the two-verb cluster test items in our study which are subordinate clauses and do not have an object. In order to determine whether the remaining participles can or cannot be used intransitively, we consulted the Dutch online dictionary *Van Dale* (Van Dale Uitgevers, 2022). Examples are *heeft georganiseerd* (*has organised*) and *heeft gewenst* (*has wished*). 47 bi-grams were excluded and 42 bi-grams remained.

- We excluded all bi-grams including participles that cannot occur with an agentive subject, again due to the syntactic structure of the two-verb cluster test items. The only bi-grams excluded were *heeft gekost* (*has cost*), *heeft gelekt* (*has leaked*) and *heeft gehouden* (*has held*). Thus, three bi-grams were excluded and 39 bi-grams remained.

- We used the participles of the remaining 39 bi-grams containing Participle-Auxiliary two-verb clusters to form the respective Auxiliary-Participle two-verb clusters. We then determined the frequencies of the 39 Auxiliary-Participle two-verb clusters in the *Groningen Twitter Corpus* and compared them to the frequencies of the 39 Participle-Auxiliary two-verb clusters. In order to do so, the Auxiliary-Participle two-verb clusters were entered one by one under *N-grams* → *Frequencies* (see https://www.let.rug.nl/gosse/Ngrams/). All remaining bi-grams did have both Participle-Auxiliary and Auxiliary-Participle two-verb clusters in the *Groningen Twitter Corpus*. Then the difference in frequency between Participle-Auxiliary and Auxiliary-Participle two-verb clusters was calculated. The reason was to select only participles which are balanced regarding the number of both Participle-Auxiliary and Auxiliary-Participle two-verb clusters in the *Groningen Twitter Corpus*. For example, the difference in frequency between *heeft gedroomd* (*has dreamed*, frequency: 2,896) and *gedroomd heeft*

(**dreamed has*, frequency: 983) is 1,913. We excluded all pairs of bi-grams that have a difference in frequency higher than 4,000. Again, this is an arbitrary threshold drawn for pragmatic reasons. As a result, 11 bi-grams were excluded and 28 bi-grams remained.

- For the same reasons as for the superlatives (see **3.3.1 Superlatives**), we excluded all bi-grams including participles not appearing in the top 5,000 words of the Hazenberg and Hulstijn list (H&H-list, Hazenberg & Hulstijn, 1996). As a result, nine bi-grams were excluded and 19 bi-grams remained.

- In a final step, we excluded all bi-grams including participles that are less accepted when used intransitively, based on the judgement of three L1 speakers of Dutch. Examples are *heeft geluisterd* (*has listened*) and *heeft geleefd* (*has lived*). As a result, seven bi-grams were excluded and twelve bi-grams remained for the creation of the two-verb cluster test items.

Table 6 shows the twelve participles selected on the basis of the criteria described above and used to create the two-verb cluster test items. The final result includes three disyllabic participles and nine trisyllabic participles.

Table 6: *Verbs for the Creation of Two-Verb Cluster Test Items (Groningen Twitter Corpus)*

bi-gram (*heeft* *) (*has* *)	freq. VERB H&H-list	finite AUX_PART / PART_AUX		
		freq. AUX_PART	freq. PART_AUX	diff. < 4,000
gedroomd	0001-2000	2,896	893	1,913
gehuild	0001-2000	1,677	412	1,265
gedanst	0001-2000	917	234	683
geslapen	0001-2000	9,367	5,709	3,658
gedronken	0001-2000	5,896	4,261	1,635
gezongen	0001-2000	4,067	1,216	2,851
geantwoord	0001-2000	2,668	785	1,883
gestudeerd	0001-2000	1,566	927	639
gelachen	0001-2000	974	373	601
gelogen	2001-3000	5,740	1,889	3,851
gezwommen	2001-3000	1,526	374	1,152
gebakken	3001-4000	2,213	1,119	1,094

3.4 Conclusion

To sum up, Dutch allows for both the morphological and syntactic superlative for trisyllabic and polysyllabic adjectives, influenced by factors like syllable count. This contrasts with German and English, where superlatives of trisyllabic and polysyllabic adjectives are strictly formed morphologically in German and syntactically in English. Similarly, Dutch allows for both Participle-Auxiliary and Auxiliary-Participle two-verb clusters, whereas German only allows for Participle-Auxiliary two-verb clusters and English for Auxiliary-Participle two-verb clusters. Dutch is between German and English. This linguistic context provides a rich basis for investigating the influence of the L1 and the L2 on the L3 in learners of L3 Dutch with L1 German and L1 English.

For our experimental task, we created the twelve superlative test items (**Table 5**) and twelve two-verb cluster test items (**Table 6**), using the n-gram frequency database of the *Groningen Twitter Corpus* (Bouma, 2015). See also **Appendix C: Items Processing and Comprehension Study** and **Appendix E: Items Production Study**. The *Groningen Twitter Corpus* includes varied usage of superlatives and two-verb clusters in Dutch, reflecting both the morphological and syntactic superlative, on the one hand, and Participle-Auxiliary and Auxiliary-Participle two-verb clusters, on the other. The *Groningen Twitter Corpus* represents informal, spontaneously produced Dutch from a diverse group of speakers, reflecting the current productivity of the linguistic properties at hand, and this productivity is reflected in the test items used in the present study.

CHAPTER 4. PSYCHOTYPOLOGY

In this chapter, we present a study on the perception of the typological proximity between Dutch, German and English of German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch to answer the first sub-question (SQ.1) of this dissertation. Next to general psychotypology, we also investigated syntactic psychotypology and morphological typology, and the factors playing a role in assessing general typological proximity[15].

4.1 Introduction

It is assumed that the extent to which the L3 is influenced by the L1 and/or the L2 depends on various different factors, amongst others by psychotypological proximity. For example, in the initial version of the Typological Primacy Model, Rothman (2011) argues that the selection of either the L1 or the L2 as transfer source depends on the typological proximity or even psychotypological proximity between the L1, L2 and L3. Slabakova (2017) also mentions psychotypological proximity as a factor in morphosyntactic transfer into the L3 in the context of the Scalpel Model (see **2.2.6 Scalpel Model**). Psychotypology can be defined as "the learner's perception of typological distance between languages, […] which is the individual assessment of the degree of relationship between particular structures and words" (Otwinowska, 2016, p. 103). According to Rothman & Cabrelli Amaro (2010), "a learner's perception of relative similarity between any two languages, … might or might not coincide with actual typology" (p. 214). Although not always the case, in many instances subjective linguistic proximity (psychotypological proximity) and objective linguistic proximity (typological proximity) are the same (Rothman, 2011). However, if the psychotypological proximity does not coincide with the typological proximity, this might result in negative transfer and lost opportunities for positive transfer (Kellerman, 1983; Rothman, 2011; see **2.2.4**

[15] This chapter is adapted from Hiemstra, A., Michel, M., & Ruigendijk, E. (2025). Psychotypologie: Perceptie van typologische afstand tussen het Nederlands en zijn Germaanse buren door Duitstalige en Engelstalige leerders en eerstetaalsprekers van het Nederlands. *Internationale Neerlandistiek*, *63*(1), 1–37; and translated into English for this dissertation.

Typological Primacy Model). In more recent versions of the Typological Primacy Model, Rothman (2015) argues that the Typological Primacy Model "rejects the notion that conscious psychotypological assessment on the part of the learner brings anything to bear" (p. 185) (see **2.2.4 Typological Primacy Model**). Thus, according to the Typological Primacy Model (2015), transfer is an unconscious process. Against this traditional view of transfer stands the increasing recognition of transfer as a conscious and intentional strategy in multilingual education (see also Herdina & Jessner, 2002) to control learners' use of transfer and promote the language learning process (Fuster & Neuser, 2021; Fuster, 2024). This is also reflected in the concept of *teaching for transfer* (Cummins, 2008, 2017), that is, raising awareness of similarities between languages to use transfer as a resource, and the model of *pedagogical translanguaging* (Cenoz & Gorter, 2014, 2020) (see **2.2.7 Discussion of Models of L3 Morphosyntactic Transfer**). In this context, it is indeed relevant to examine how learners perceive the typological proximity between the languages in question.

The aim of this study is to replicate parts of Vismans and Wenzel's (2012) study. In this context, we want to find out how German-speaking and English-speaking learners of L3 Dutch perceive the typological proximity between Dutch, German and English, what factors play a role in assessing typological proximity, and to what extent language proficiency of Dutch affects the perception of typological proximity. We also want to find out how they rank the North Germanic languages Danish and Swedish compared to Dutch and West Germanic languages in general. In this context, the question arises whether they show a historical or a comparative ranking (see **2.3.2 Typology and Psychotypology**). In addition, we extend the study by Vismans and Wenzel (2012). Specifically, we want to know how L1 speakers of Dutch perceive the typological proximity between Dutch, German and English, and what factors play a role in assessing typological proximity. To our knowledge, this has not yet been investigated. Furthermore, we want to investigate to what extent German-speaking learners and English-speaking learners of L3 Dutch as well as L1 speakers of Dutch perceive differences between the general, syntactic and morphological proximity between Dutch, German and English. Since the perception of typological proximity between languages might differ for different language levels (e.g., lexicon, syntax or morphology), the question arises whether a difference can be identified at the level of linguistic domains. To our knowledge, this too has not yet been investigated. We formulate the following research question, which is the first sub-question of this dissertation:

(SQ.1) What perception do German-speaking and English-speaking learners of L3 Dutch have of the typological proximity between Dutch, German and English?

Our hypothesis based on the results of Vismans and Wenzel (2012) is that German-speaking and English-speaking learners of L3 Dutch rank German as first closest to Dutch and English as second closest to Dutch, and that the factor *vocabulary* plays the most important role in this. Following this hypothesis, we assume that the same is true for L1 speakers of Dutch. Furthermore, we formulate the following sub-questions:

(SQ.1.1) What position do the North Germanic languages Danish and Swedish occupy in relation to the West Germanic languages Dutch, German and English?

(SQ.1.2) To what extent does language proficiency in L3 Dutch affect German-speaking and English-speaking learners' perceptions of Dutch with respect to the typological proximity between Dutch, German and English?

(SQ.1.3) Do the perceptions of German-speaking learners and English-speaking learners of L3 Dutch as well as L1 speakers of Dutch differ with regard to the general, syntactic and morphological proximity between Dutch, German and English?

We assume that Danish and Swedish are perceived as less close to Dutch than German and English (Vismans & Wenzel 2012) and that the psychotypological proximity between Dutch, German and English changes as proficiency in L3 Dutch of German-speaking and English-speaking learners of Dutch increases (Kellerman 1986). Regarding the perceptions of the general, syntactic and morphological proximity between Dutch, German and English, we assume that these perceptions do not differ among German-speaking and English-speaking learner of L3 Dutch, and L1 speakers of Dutch.

4.2 Method

In order to answer the questions on the perception of German-speaking learners of L3 Dutch, English-speaking learners of L3 Dutch, and L1 speakers of Dutch of the

typological proximity between Dutch, German and English, we used an online questionnaire, including ranking questions on general psychotypology, syntactic psychotypology and morphological typology. With this questionnaire, we also investigated which factors play a role in assessing general typological proximity by using open questions.

4.2.1 Participants

Three groups of participants took part in the experiment: German-speaking learners of L3 Dutch with L2 English, English-speaking learners of L3 Dutch with L2 German, and L1 speakers of Dutch. All participants reported having normal hearing, normal eyesight and no cognitive impairments. A summary of the demographic details and LexTALE scores for each group is shown in **Table 7**.

Table 7: *Demographic Details and LexTALE Scores for Participants of Psychotypology Study*

Group	No.	Age			Gender				LexTALE	
		Mean	SD	Range	Female	Male	Divers	No answer	L2	Dutch
German-speaking learners of L3 Dutch with L2 English	61	24.89	5.53	18-46	44	16	1	0	74.45%	66.88%
English-speaking learners of L3 Dutch with L2 German	28	23.71	8.37	18-59	19	9	0	0	66.14%	58.82%
L1 speakers of Dutch	81	21.34	2.36	18-28	53	25	2	1	-	-

All but five of the German-speaking learners of L3 Dutch with L2 English were students at German universities (University Oldenburg, University Münster, Free University Berlin, University Cologne and University Duisburg-Essen). Three of them reported having more than one L1: German and Russian, German, Russian and Sign Language, German and Turkish. All of them learned English as a true L2 and Dutch after English. Students who had another West Germanic L1 in addition to German were not permitted to take part in the study.

All but four of the English-speaking learners of L3 Dutch with L2 German were students at British and American universities, most of them University of Sheffield, but also University of Newcastle upon Tyne, University of California, Berkeley,

Stanford University, Columbia University and New York University. Two of them reported having more than one L1: English and Chinese, and English, Konkani and Hindi. Ten of them learned German as a true L2, 15 after learning one or more Romance languages, one after learning Greek, one after learning Spanish, French and Urdu, and one after learning Malayalam, Tamil and Welsh.

All but seven of the L1 speakers of Dutch were students at Dutch universities, most of them University of Groningen. Thirteen of them reported having more than one L1: 11 Dutch and Frisian, one Dutch and Twents, and one Dutch and Russian. All of them have relatively good knowledge of English (self-assessment: $M = 1.45$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.61$), and all but four have also some knowledge of German (self-assessment: $M = 3.23$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.77$).

All participants gave their consent prior to the experiment after being informed in writing. Their participation in this study was anonymous and they received financial compensation for their participation. This study was approved by the Research Ethics Review Committee (CETO) of the Faculty of Arts of the University of Groningen.

4.2.2 Materials

We used an online questionnaire to investigate the general, syntactic and morphological psychotypology between Dutch, German and English in German-speaking learners of L3 Dutch with L2 English, English-speaking learners of L3 Dutch with L2 German and L1 speakers of Dutch (see **Appendix A: Questionnaire Psychotypology**). Participants received the questionnaire in their respective L1. The following languages could be selected in the questionnaire on psychotypological proximity: Danish, Welsh, German, Czech, English, Spanish, French and Swedish. We arranged the languages in the questionnaire in this random order. In terms of language selection, we followed Vismans and Wenzel (2012) to compare our results. In our study, however, we did not include Russian, because sufficient distractors were already included with Czech and Welsh. Moreover, Russian was of limited relevance in the results of Vismans and Wenzel (2012). Participants could choose one language for each place (i.e., first closest to Dutch, second closest to Dutch, and third closest to Dutch). It was also possible to give no answer, but this was a rare occurrence. Participants' responses in assessing general typological proximity were assigned to the factors presented by Vismans and

Wenzel (2012) in the results of their study: *vocabulary*, *grammar*, *sounds*, *roots*, *dialect*, *spelling*, *geography* and *Romance influence*. Other factors did not emerge in our data. Participants could give multiple answers.

4.2.3 Procedure

Before filling in the questionnaire on psychotypological proximity, participants filled in a questionnaire on personal and linguistic biographical data. This questionnaire consisted of questions on age, gender, L1(s) and foreign languages, age of onset and years of acquisition of foreign languages, self-assessment L2 (English/German) and L3 (Dutch) and professional activity (**Appendix B: Questionnaire Personal and Linguistic data**). Participants needed around five minutes to complete both questionnaires. After filling in the questionnaires, German-speaking participants took the English (L2) and Dutch (L3) version of the LexTALE test; English-speaking participants took the German (L2) and Dutch (L3) version of the LexTALE test. LexTALE (Lemhöfer & Broersma, 2012) is an un-speeded visual lexical decision task measuring language proficiency based on vocabulary knowledge. It is a standardised test of vocabulary knowledge of "lower intermediate (or lower), upper intermediate, and advanced users" (p. 341) learners of L2 English and "preferable to self-ratings" (p. 340). LexTALE scores can be interpreted as follows: 80%–100% = upper and lower advanced/proficient user (C1 & C2), 60%–80% = upper intermediate (B2), and below 59% = lower intermediate and lower (B1 and lower) (Lemhöfer & Broersma (2012). It is also available for German and Dutch, but is not yet standardised for these languages to our knowledge. For a critical discussion of LexTALE see Puig-Mayenco et al. (2023).

4.2.4 Analysis

The data for the languages in first, second and third place were statistically analysed with R (R Core Team, 2023) by means of multinomial logistic regression models, using the package *nnet* (Venables & Ripley, 2002). The languages chosen in first, second and third place were used as categorical response variables, with Group as a fixed effect. We always summarise the languages we do not focus on and compare this category *REST* with the languages we focus on. We always base this choice on three arguments: typological proximity, the results of Vismans and Wenzel (2012), and the statistical method. The first two arguments reflect the theoretical

background, the third argument is due to the properties of the statistical method we used for data analysis (see below).

For the languages in the first place, we concentrate on German and English and compare the two with the category *REST* (Swedish, Danish, French, Welsh, Czech and Spanish). From a typological point of view, it is to be expected that the West Germanic languages play a role here. The results of Vismans and Wenzel (2012) confirm this. For the languages in second place, we concentrate on German, English, Swedish and Danish and compare these four with the category *REST* (French, Welsh, Czech and Spanish). From a typological perspective, it is to be expected that in addition to West Germanic languages, North Germanic languages might also play a role here (see **2.3.2 Typology and Psychotypology**) and the results of Vismans and Wenzel (2012) also confirm this. For the languages in third place, we concentrate on German, English, Swedish, Danish and French and compare these five with the category *REST* (Welsh, Czech and Spanish). Due to the language contact situation between Dutch and French, on the one hand, and the influence that French has had on Dutch, especially Dutch vocabulary, on the other, it is to be expected that French might play a role here, alongside Germanic languages. The results of Vismans and Wenzel (2012) also confirm this.

Parameter significance was assessed using ANOVA Wald chi-square tests. To investigate the main effect for Group, we performed pairwise comparisons using the package *emmeans* (Lenth, 2021) with Tukey adjustments. We added the LexTALE scores for Dutch (coded as LextaleDUT) as covariates to the models and tested whether they should be included through model comparisons (see Baayen et al., 2008). Since we only had LexTALE scores for learners of L3 Dutch (i.e. German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German), we ran new models using only these two groups of learners. LextaleDUT did not significantly improve the model fit and was therefore not included in the final models. We can therefore conclude that language proficiency in Dutch does not affect German-speaking and English-speaking learners' perceptions of Dutch with respect to the typological proximity between Dutch, German and English (SQ.1.2).

The data for the factors involved in assessing typological proximity were statistically analysed with R (R Core Team, 2023) using a chi-square test. For these factors, in addition to the linguistic factors *vocabulary*, *grammar* and *sounds*, we also focus on the factor *roots* and compare these four with the category *REST* (*spelling*, *geography*, *dialect* and *Romance influence*). This is based on the results

of Vismans and Wenzel (2012) who found that these factors play the largest role in assessing typological proximity in German-speaking and English-speaking learners of L3 Dutch.

During data analysis, it became clear that this way of summarising made sense. We tested the categories both separately and with the category *REST*. Analysis with separate categories raises two problems. First, individual categories cannot be included in the chi-square tests if the total number of responses in these categories is zero. But not choosing a category is also a choice. Second, not all the assumptions of the chi-square tests are met: Around 50 % of the expected values are smaller than five; in many cases they are even smaller than one. This is due to the number of participants and the fact that certain languages and factors were rarely chosen. In the analysis with the category *REST*, these problems do not exist: All categories are included in the analysis and the number of expected values smaller than five is considerably lower; never are expected values smaller than one.

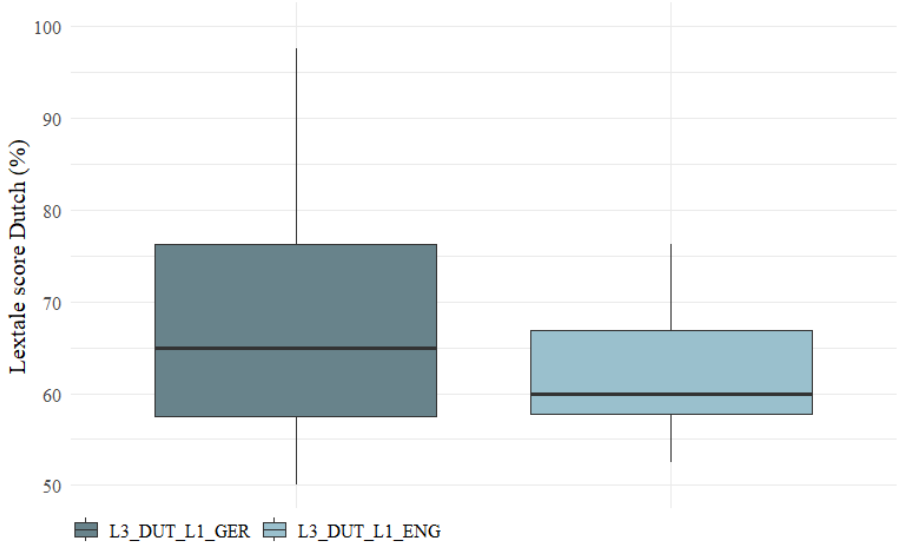
4.3 Results

In this chapter, we firstly present our results on language proficiency of the German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German. After that, we present our results on the perception of German-speaking learners and English-speaking learners of L3 Dutch, and L1 speakers of Dutch of the typological proximity between Dutch, German and English, and on the factors involved in assessing general typological proximity. Finally, we present our results on syntactic psychotypology and morphological typology in German-speaking learners and English-speaking learners of L3 Dutch, and L1 speakers of Dutch.

4.3.1 Language Proficiency

The LexTALE scores for Dutch for the two groups of learners of L3 Dutch are shown in **Figure 1**. For German-speaking and English-speaking learners of Dutch, Dutch is the L3 after L1 German/English and L2 English/German. The LexTALE scores for the L2 for the two groups of learners of Dutch are shown in **Figure 2**. For German-speaking learners of L3 Dutch, the L2 is English, and for English-speaking learners of L3 Dutch, the L2 is German.

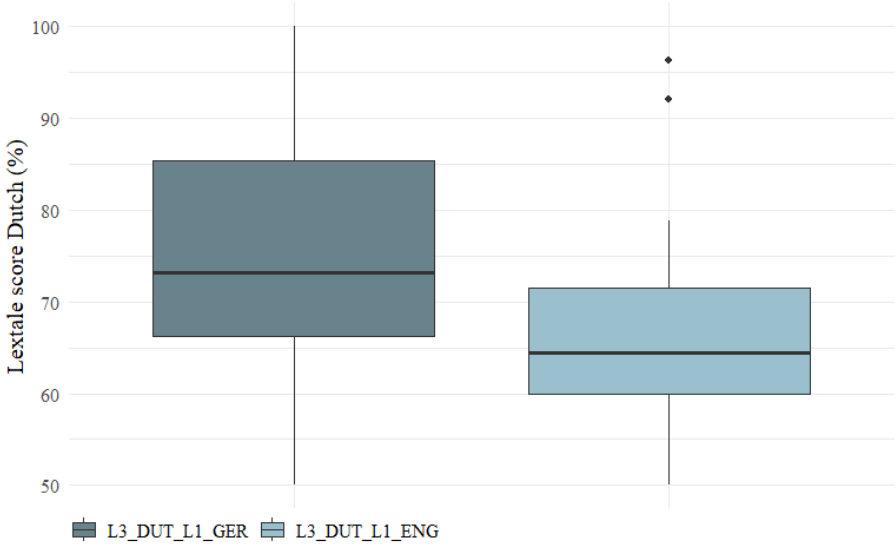
Figure 1: *LexTALE Scores for L3 Dutch for German-Speaking Learners with L2 English and English-Speaking Learners with L2 German*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German.

The LexTALE score for L3 Dutch was *M* = 66.88, *SD* = 11.14, 95% CI [64.03, 69.73], (upper intermediate) for German-speaking learners of L3 Dutch, and *M* = 59.82, *SD* = 9.57, 95% CI [55.11, 62.53], (lower intermediate and lower) for English-speaking learners of L3 Dutch. The two groups significantly differed from each other in terms of LexTALE scores for Dutch (p = .001).

Figure 2: *LexTALE Scores for L2s for Learners of L3 Dutch, English and German, Respectively*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German.

The LexTALE score for L2 English was *M* = 74.45, *SD* = 11.14, 95% CI [70.98, 77.91], (upper intermediate) for German-speaking learners of L3 Dutch, and for L2 German *M* = 66.14, *SD* = 9.57, 95% CI [62.06, 70.22], (upper intermediate) for English-speaking learners of L3 Dutch. Again, the two groups significantly differed from each other in terms of LexTALE scores for the L2 (p = .005).

4.3.2 General Psychotypology

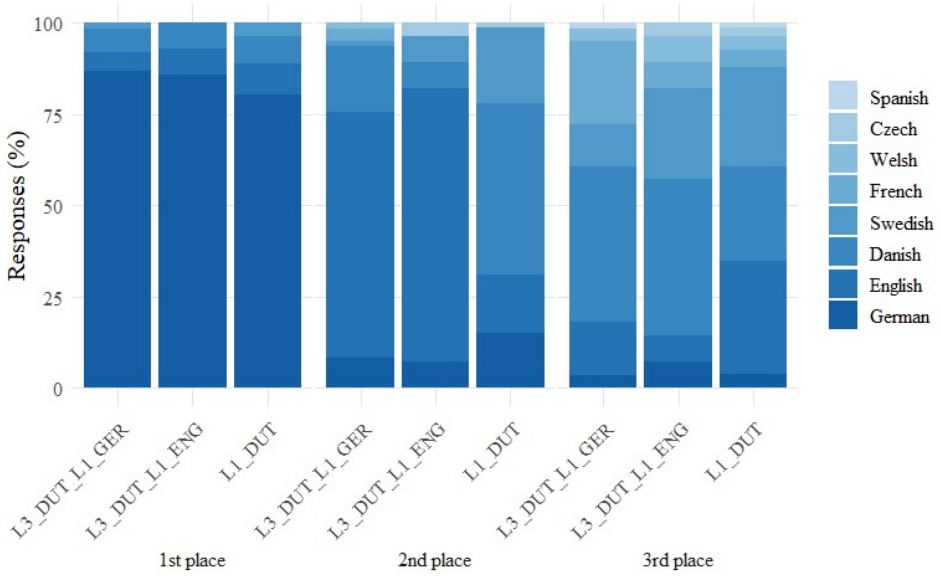
We asked German-speaking and English-speaking learners of L3 Dutch as well as L1 speakers of Dutch to choose, from a list of eight languages, three languages that they think are closest to Dutch and put the language closest to Dutch first. The responses are shown in **Table 8** and **Figure 3**.

Table 8: *General Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Number of Responses per Language per Group)*

place	group	GER	ENG	DAN	SWE	FRE	WEL	CZE	SPA	*REST*	*NA*
1st place	L1_GER (61)	53 (87%)	3 (5%)	4 (7%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (8%)	0 (0%)
	L1_ENG (28)	24 (86%)	2 (7%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (7%)	0 (0%)
	L1_DUT (81)	65 (80%)	7 (9%)	6 (7%)	3 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (11%)	0 (0%)
2nd place	L1_GER (61)	5 (8%)	41 (67%)	11 (18%)	1 (2%)	2 (3%)	1 (2%)	0 (0%)	0 (0%)	3 (5%)	0 (0%)
	L1_ENG (28)	2 (7%)	21 (75%)	2 (7%)	2 (7%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	1 (4%)	0 (0%)
	L1_DUT (81)	12 (15%)	13 (16%)	38 (47%)	17 (21%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)	1 (1%)	0 (0%)
3rd place	L1_GER (61)	2 (3%)	9 (15%)	26 (43%)	7 (11%)	14 (23%)	2 (3%)	0 (0%)	1 (2%)	3 (5%)	0 (0%)
	L1_ENG (28)	2 (7%)	2 (7%)	12 (43%)	7 (25%)	2 (7%)	2 (7%)	1 (4%)	0 (0%)	3 (11%)	0 (0%)
	L1_DUT (81)	3 (4%)	25 (31%)	21 (26%)	22 (27%)	4 (5%)	3 (4%)	2 (2%)	1 (1%)	6 (7%)	0 (0%)

L1_GER = German-speaking learners of L3 Dutch with L2 English, L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch; GER = German, ENG = English, DAN = Danish, SWE = Swedish, FRE = French, CZE = Czech, SPA = Spanish, *REST* = categories including languages indicated in grey.

Figure 3: *General Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Percentage of Responses per Language per Group)*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch.

Results show that Welsh (0% - 7%), Czech (0% - 4%) and Spanish (0% - 2%) do not play a major role in the data. For the responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch for the languages in first place, there was no main effect for Group (p = .841). German-speaking learners (87%), English-speaking learners (86%) and L1 speakers of Dutch (80%) put German in first place and only a small number of the participants put English in first place (German-speaking learners of Dutch = 5%, English-speaking learners of Dutch = 7%, L1 speakers of Dutch = 9%), with Danish and Swedish being mentioned to an even lesser extent here. Post-hoc pairwise comparisons showed that German-speaking learners (German-English p = .003, German-*REST* p = .004), English-speaking learners (German-English p = .023, German-*REST* p = .023) and L1 speakers of Dutch (German-English p = .002, DE-*REST* p = .003) put German in first place significantly more often than English and the category *REST*.

However, there is a main effect for Group for the languages in second place (p = < .001). German-speaking learners (67%) and English-speaking learners (75%) of L3 Dutch put English in second place, followed by Danish (German-speaking learners of Dutch = 18%, English-speaking learners of Dutch = 7%), German (German-speaking learners of Dutch = 8%, English-speaking learners of Dutch = 7%) and Swedish (German-speaking learners of Dutch = 2%, English-speaking learners of Dutch = 7%). French plays only a minor role here. In contrast, L1 speakers of Dutch put Danish (47%) in second place, followed by Swedish (21%), English (16%) and German (15%). L1 speakers of Dutch show more variation with respect to the language they put in second place than German-speaking and English-speaking learners of Dutch. Post-hoc pairwise comparisons showed that German-speaking learners (English-German p = .003, English-Danish p = .012, English-Swedish p = .006, English-*REST* p = .002) and English-speaking learners (English-German p = .025, English-Danish p = .025, English-Swedish p = .025, English-*REST* p = .026) of L3 Dutch put English in second place significantly more often than German, Danish, Swedish and the category *REST*. L1 speakers of Dutch (Danish-German p = .024, Danish-English p = .032, Danish-*REST* p = .003) put Danish in second place significantly more often than German, English and the category *REST*. For the difference between Danish-Swedish, there is only a marginal effect (p = .094).

There is also a main effect for Group for the languages in third place (p = .002). German-speaking learners (43%) and English-speaking learners (43%) of L3 Dutch put Danish in third place. In German-speaking learners of L3 Dutch, French (23%), English (15%) and Swedish (11%) follow. Post-hoc pairwise comparisons showed that the difference Danish-German (p = .016) and also the difference Danish-*REST* (p = .016) are significant, but the rest are not (Danish-French p = .444, Danish-English p = .106, Danish-Swedish p = .052). In English-speaking learners of L3 Dutch, Swedish (25%) follows, and equally German, English and French (7%). However, post-hoc pairwise comparisons showed no significant differences between the languages English-speaking learners of L3 Dutch put in third place. German is hardly mentioned by German-speaking learners (3%) and also English-speaking learners (7%) here, which follows logically from the fact that both groups put German mainly in first place and to a lesser extent in second place. Interestingly, German-speaking learners of L3 Dutch ranked French third more often than Swedish. English-speaking learners of L3 Dutch, in contrast to German-speaking learners, place Swedish before French. With regard to the language they

rank third, German-speaking and English-speaking learners of L3 Dutch now also show variation. L1 speakers of Dutch put English (31%) in third place, very closely followed by Swedish (27%) and Danish (26%), then followed by French (5%) and German (4%). Post-hoc pairwise comparisons showed that L1 speakers of Dutch put English (English-French p = .026, English-German p = .022, English-*REST* p = .048) in third place significantly more often than French, German and the category *REST*. They also put Swedish significantly more often in third place than French (p = .047) and German (p = .037). Danish, they put in third place significantly more often than German (p = .045) and only marginally more often than French (p = .058). The differences between English-Danish (p = .990) and English-Swedish (p = .998) are not significant. L1 speakers of Dutch thus show variation, just as with respect to the language they put in second place, also with respect to the language they put in third place. After all, the choice of second place affects the choice of third place.

Based on the data above, we conclude that this is the overall perception of German-speaking and English-speaking learners of L3 Dutch:

- German-speaking learners of L3 Dutch:
  Dutch - **German** - **English** - Danish - French - Swedish

- English-speaking learners of L3 Dutch:
  Dutch - **German** - **English** - Danish - Swedish - French

German-speaking and English-speaking learners of L3 Dutch give a ranking corresponding to the historical subdivision, within which English stands between Dutch and German, on one side, and the North Germanic languages Danish and Swedish, on the other. Interestingly, French occupies a place between Danish and Swedish in German-speaking learners of Dutch. In L1 speakers of Dutch, we argue that due to the greater variation in the data above, the following global rankings can be seen:

- L1 speakers of Dutch:
  Dutch - **German** - Danish - Swedish - **English** - French
  Dutch - **German** - Swedish - Danish - **English** - French

These rankings become even clearer when the answers for the North Germanic languages Danish and Swedish are added together. The North Germanic languages are put in second (North Germanic 68%, English 16%) and third (North Germanic 53%, English 31%) place more often than English. Moreover, 44% of L1 speakers of Dutch place English neither in first, second nor third place. Almost half of the L1 speakers of Dutch thus assume that English ranks at least fourth after Swedish. Therefore, L1 speakers of Dutch give a comparative ranking, within which the North Germanic languages occupy a place between Dutch and German on one side, and English on the other.

4.3.3 Factors in Assessing General Psychotypology

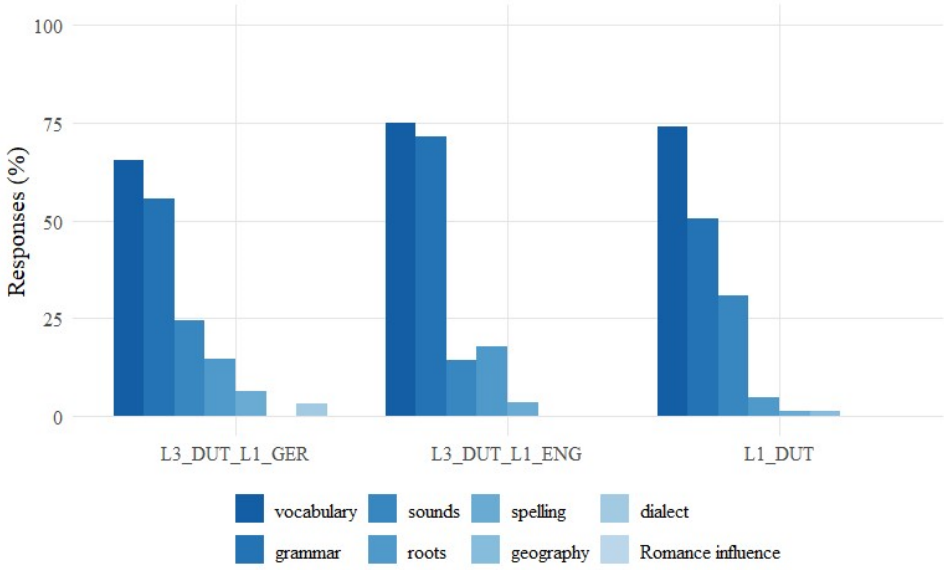
We asked German-speaking learners and English-speaking learners of L3 Dutch as well as L1 speakers of Dutch in what respect the language they ranked first is most similar to Dutch. The answers are shown in **Table 9** and **Figure 4**.

Table 9: *Factors in Assessing Typological Proximity: Number of Responses per Factor per Group*

group	vocabulary	grammar	sounds	roots	spelling	geography	dialect	Romance influence	*REST*
L1_GER (61)	40 (66%)	34 (56%)	15 (25%)	9 (15%)	4 (7%)	0 (0%)	2 (3%)	0 (0%)	6 (10%)
L1_ENG (28)	21 (75%)	20 (71%)	4 (14%)	5 (18%)	1 (4%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)
L1_DUT (81)	60 (74%)	41 (51%)	25 (31%)	4 (5%)	1 (1%)	1 (1%)	0 (0%)	0 (0%)	2 (2%)

L1_GER = German-speaking learners of L3 Dutch with L2 English, L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch; *REST* = categories including languages indicated in grey.

Figure 4: *Factors in Assessing Typological Proximity: Percentages of Participants that Gave Factor as Response*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch.

The responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch with regard to the factors involved in assessing typological proximity did not differ significantly from each other ($\chi 2$ (8, N = 287) = 12.3, p = .139). German-speaking learners, English-speaking learners and L1 speakers of Dutch generally mention the same factors when assessing typological proximity in terms of their choice of the language they put in first place. Moreover, the frequency of the factors mentioned also largely coincides in the three groups. The factor *vocabulary* (German-speaking learners of Dutch = 66%, English-speaking learners of Dutch = 75%, L1 speakers of Dutch = 74%) comes first in the three groups, followed by the factors *grammar* (German-speaking learners of Dutch = 56%, English-speaking learners of Dutch = 71%, L1 speakers of Dutch = 51%), *sounds* (German-speaking learners of Dutch = 25%, English-speaking learners of Dutch = 14%, L1 speakers of Dutch = 31%) and *roots* (German-speaking learners of Dutch = 15%, English-speaking learners of Dutch = 18%, L1 speakers of Dutch = 5%). Like the factors *geography*, *dialect* and *Romance influence*, the factor *spelling*

plays almost no role. To be complete, all three groups mention the factor *spelling* (German-speaking learners of Dutch = 7%, English-speaking learners of Dutch = 4%, L1 speakers of Dutch = 1%), only L1 speakers of Dutch mention the factor *geography* (1%) and only German-speaking learners of Dutch mention the factor *dialect* (3%).

4.3.4 Syntactic Psychotypology

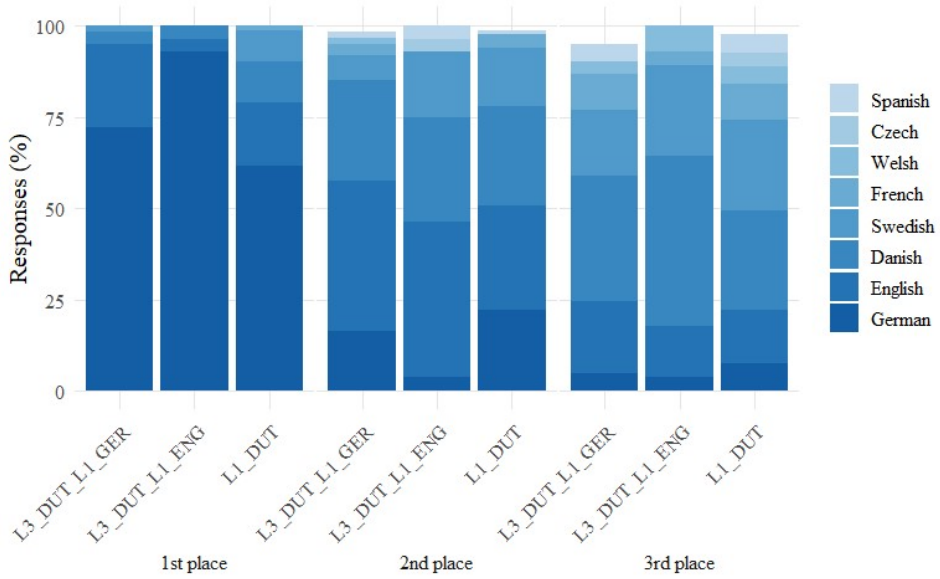
We also asked German-speaking learners and English-speaking learners of L3 Dutch as well as L1 speakers of Dutch to choose, from a list of eight languages, three languages that they think are closest to Dutch syntax and morphology, and to put the language that is closest to Dutch syntax and morphology first in each case. The responses are shown in **Table 10**, **Figure 5, Table 11** and **Figure 6**.

Table 10: *Syntactic Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Number of Responses per Language per Group)*

place	group	GER	ENG	DAN	SWE	FRE	WEL	CZE	SPA	*REST*	*NA*
1st place	L1_GER (61)	44 (72%)	14 (23%)	2 (3%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (5%)	0 (0%)
	L1_ENG (28)	26 (93%)	1 (4%)	1 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)
	L1_DUT (81)	50 (62%)	14 (17%)	9 (11%)	7 (9%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)	17 (21%)	0 (0%)
2nd place	L1_GER (61)	10 (16%)	25 (41%)	17 (28%)	4 (7%)	2 (3%)	1 (2%)	0 (0%)	1 (2%)	4 (7%)	1 (2%)
	L1_ENG (28)	1 (4%)	12 (43%)	8 (29%)	5 (18%)	0 (0%)	0 (0%)	1 (4%)	1 (4%)	2 (8%)	0 (0%)
	L1_DUT (81)	18 (22%)	23 (28%)	22 (27%)	13 (16%)	3 (4%)	0 (0%)	0 (0%)	1 (1%)	4 (5%)	1 (1%)
3rd place	L1_GER (61)	3 (5%)	12 (20%)	21 (34%)	11 (18%)	6 (10%)	2 (3%)	0 (0%)	3 (5%)	5 (8%)	3 (5%)
	L1_ENG (28)	1 (4%)	4 (14%)	13 (46%)	7 (25%)	1 (4%)	2 (7%)	0 (0%)	0 (0%)	2 (7%)	0 (0%)
	L1_DUT (81)	6 (7%)	12 (15%)	22 (27%)	20 (25%)	8 (10%)	4 (5%)	3 (4%)	4 (5%)	11 (14%)	2 (2%)

L1_GER = German-speaking learners of L3 Dutch with L2 English, L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch; GER = German, ENG = English, DAN = Danish, SWE = Swedish, FRE = French, CZE = Czech, SPA = Spanish, *REST* = categories including languages indicated in grey.

Figure 5: *Syntactic Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Percentage of Responses per Language per Group)*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch.

Results show that Welsh (0% - 7%), Czech (0% - 4%) and Spanish (0% - 5%) did not play a major role in the data here either. For the responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch for the language in first place, there was a main effect for Group (p = < .001). German-speaking learners of L3 Dutch (72%) and L1 speakers of Dutch (62%) put German in first place, followed by English (German-speaking learners of Dutch = 23%, L1 speakers of Dutch = 17%). English-speaking learners of L3 Dutch, on the other hand, put German (93%) almost exclusively in first place. English (4%) is hardly mentioned at all. Danish and Swedish are also mentioned. However, L1 speakers of Dutch mention these more often than German-speaking and English-speaking learners of L3 Dutch. French is mentioned once by L1 speakers of Dutch. Post-hoc pairwise comparisons showed that German-speaking learners (German-English p = .021, German-*REST* p = .005), English-speaking learners (German-English p = .026, German-*REST* p = .026) and L1 speakers of Dutch (German-English p = .011,

German-*REST* p = .018) put German in first place significantly more often than English and the category *REST*.

Regarding the languages in second place, there is no main effect for Group (p = .182). German-speaking learners (41%) and L1 speakers of Dutch (28%) put English in second place, followed by Danish (German-speaking learners of Dutch = 28%, L1 speakers of Dutch = 27%), German (German-speaking learners of Dutch = 16%, L1 speakers of Dutch = 22%) and Swedish (German-speaking learners of Dutch = 7%, L1 speakers of Dutch = 16%). While English-speaking learners of L3 Dutch also put English (43%) in second place, followed by Danish (29%) and Swedish (18%), German, which is usually put in first place and therefore not available for second place, is unsurprisingly not frequently mentioned here (4%). French plays a minor role only in German-speaking learners and L1 speakers of Dutch. Post-hoc pairwise comparisons showed that German-speaking learners of L3 Dutch (English-Swedish p = .023, English-*REST* p = .023) put English in second place significantly more often than Swedish and the category *REST*. For the languages Danish (p = .734) and German (p = .152), there was no significant difference with English. For English-speaking learners of L3 Dutch, however, post-hoc pairwise comparisons showed no significant differences between the languages. L1 speakers of Dutch (English-*REST* p = .035) put English in second place significantly more often than the category *REST*. There were no significant differences between English-Danish (p = .999), English-German (p = .932) and English-Swedish (p = .491).

There is also no main effect for Group for the responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch for the languages in third place (p = .728). German-speaking learners (34%), English-speaking learners (46%) and L1 speakers (27%) of Dutch put Danish in third place. Following this in English-speaking learners and L1 speakers of Dutch are Swedish (English-speaking learners of Dutch = 25%, L1 speakers of Dutch = 25%), English (English-speaking learners of Dutch = 14%, L1 speakers of Dutch = 15%), French (English-speaking learners of Dutch = 4%, L1 speakers of Dutch = 10%) and German (English-speaking learners of Dutch = 4%, L1 speakers of Dutch = 7%); in German-speaking learners of Dutch, English (20%), Swedish (18%), French (10%) and German (5%). Post-hoc pairwise comparisons showed only that German-speaking learners of L3 Dutch put Danish significantly more often in third place than German (p = .034) and marginally more often than the category *REST* (p = .076). For the languages English (p = .633), Swedish (p = .517) and French (p = .110), there is no significant

difference with Danish. In English-speaking learners and L1 speakers of Dutch, however, post-hoc pairwise comparisons showed no significant differences between the languages.

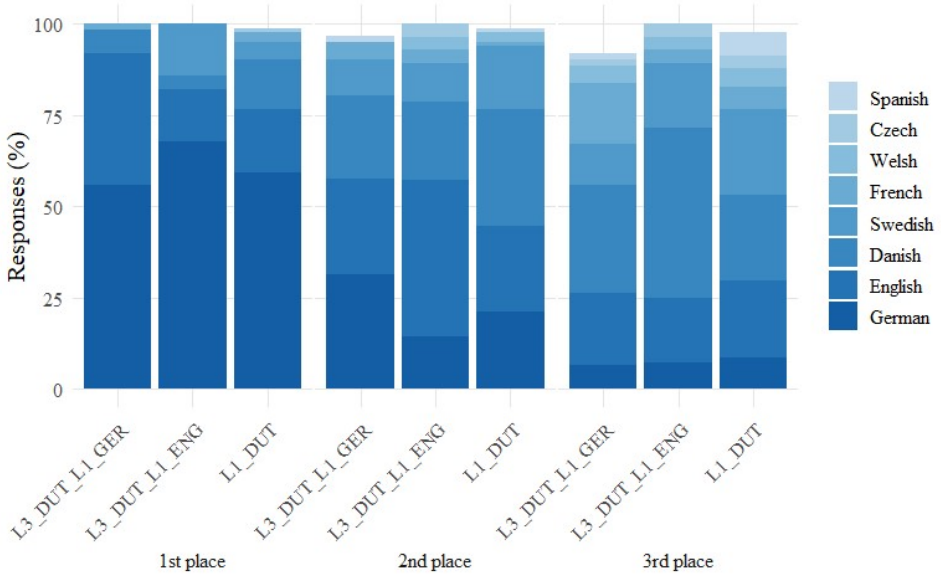
4.3.5 Morphological Psychotypology

Table 11: *Morphological Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Number of Responses per Language per Group)*

place	group	GER	ENG	DAN	SWE	FRE	WEL	CZE	SPA	*REST*	*NA*
1st place	L1_GER (61)	34 (56%)	22 (36%)	4 (7%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	5 (9%)	0 (0%)
	L1_ENG (28)	19 (68%)	4 (14%)	1 (4%)	4 (14%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (18%)	0 (0%)
	L1_DUT (81)	48 (59%)	14 (17%)	11 (14%)	4 (5%)	2 (2%)	0 (0%)	1 (1%)	0 (0%)	18 (22%)	1 (1%)
2nd place	L1_GER (61)	19 (31%)	16 (26%)	14 (23%)	6 (10%)	3 (5%)	0 (0%)	0 (0%)	1 (2%)	4 (7%)	2 (3%)
	L1_ENG (28)	4 (14%)	12 (43%)	6 (21%)	3 (10%)	1 (4%)	1 (4%)	1 (4%)	0 (0%)	3 (12%)	0 (0%)
	L1_DUT (81)	17 (21%)	19 (24%)	26 (32%)	14 (17%)	1 (1%)	2 (2%)	0 (0%)	1 (1%)	4 (4%)	1 (1%)
3rd place	L1_GER (61)	4 (7%)	12 (20%)	18 (30%)	7 (11%)	10 (16%)	3 (5%)	1 (2%)	1 (2%)	5 (9%)	5 (8%)
	L1_ENG (28)	2 (7%)	5 (18%)	13 (46%)	5 (18%)	1 (4%)	1 (4%)	1 (4%)	0 (0%)	2 (8%)	0 (0%)
	L1_DUT (81)	7 (9%)	17 (21%)	19 (24%)	19 (24%)	5 (6%)	4 (5%)	3 (4%)	5 (6%)	12 (15%)	2 (2%)

L1_GER = German-speaking learners of L3 Dutch with L2 English, L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch; GER = German, ENG = English, DAN = Danish, SWE = Swedish, FRE = French, CZE = Czech, SPA = Spanish, *REST* = categories including languages indicated in grey.

Figure 6: *Morphological Psychotypology: Languages German-Speaking Learners, English-Speaking Learners and L1 Speakers of Dutch Ranked First, Second and Third (Percentage of Responses per Language per Group)*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German, L1_DUT = L1 speakers of Dutch.

The results show that Welsh (0% - 5%), Czech (0% - 4%) and Spanish (0% - 6%) do not play a major role in the data here either. Although German-speaking learners (56%), English-speaking learners (68%) and L1 speakers (59%) of Dutch all put German in first place, followed by English (German-speaking learners of Dutch = 36%, English-speaking learners of Dutch = 14%, L1 speakers of Dutch = 17%), German-speaking learners of L3 Dutch clearly put English in first place more often than the other two groups. Danish and Swedish are also mentioned. While German-speaking learners and L1 speakers of Dutch mention Danish more often, English-speaking learners mention Swedish more often. However, for the responses of German-language learners, English-language learners and L1 speakers of Dutch, there is no main effect for Group ($p = .241$). French is mentioned to a lesser extent by all three groups. Post-hoc pairwise comparisons showed that German-speaking learners of L3 Dutch put German (German-*REST* $p = .011$) and English (English-*REST* $p = .046$) in first place significantly more often than the

category *REST*. The difference between German and English is not significant (p = .318). L1 speakers of Dutch put German (German-English p = .013, German-*REST* p = .025) in first place significantly more often than English and the category *REST*. For English-speaking learners of L3 Dutch, there is only a marginal difference (German-English p = .054, German-*REST* p = .073).

With regard to the languages in second place, at first glance we see differences between the three groups here too. German-speaking learners of L3 Dutch put German (31%) in second place, followed by English (26%), Danish (23%) and Swedish (10%). English-speaking learners of L3 Dutch, on the other hand, put English (43%) in second place, followed by Danish (21%), German (14%) and Swedish (14%). L1 speakers of Dutch in turn put Danish (32%) in second place, followed by English (24%), German (21%) and Swedish (17%). However, for the responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch for the languages in second place, again there is no main effect for Group (p = .308). French plays only a minor role here. Post-hoc pairwise comparisons do not indicate significant differences between languages.

Although we also see small differences between the three groups with regard to the languages they put in third place, for the responses of German-speaking learners, English-speaking learners and L1 speakers of Dutch, there is no main effect for Group here either (p = .212). German-speaking learners (30%), and English-speaking learners (46%) of L3 Dutch put Danish in third place. L1 speakers of Dutch put Danish and Swedish equally in third place (24%). For German-speaking learners of L3 Dutch, English (20%), French (16%), Swedish (11%) and German (7%) follow; for English-speaking learners of L3 Dutch, English and Swedish (18%), German (7%) and French (4%); and for L1 speakers of Dutch, English (21%), German (9%) and French (6%). Post-hoc pairwise comparisons however do not indicate significant differences between languages.

4.3.6 Psychotypology Comparison: General, Syntactic, Morphological

The responses given by L1 speakers of Dutch for the languages in first, second and third place for general, syntactic and morphological psychotypology show only small non-significant differences. Even if the impression arises that English is moving towards Dutch in terms of syntactic and morphological psychotypology, we must conclude on the basis of the statistical analyses that these are, at most,

slight trends: first place: $\chi 2$ (4, N = 242) = 9.3, p = .055; second place: $\chi 2$ (8, N = 241) = 11.5, p = .177, third place: $\chi 2$ (10, N = 239) = 10.4, p = .403.

English-speaking learners of L3 Dutch also show only small non-significant differences in terms of the language they put in first place for general, syntactic and morphological psychotypology. English is almost not mentioned as far as syntactic psychotypology is concerned. Thus, English seems to be moving away from Dutch here. However, the difference between syntactic psychotypology and general and morphological psychotypology is not significant ($\chi 2$ (4, N = 84) = 6.4, p = .172). For the languages in second place ($\chi 2$ (8, N = 84) = 11.5, p = .175) and third place ($\chi 2$ (10, N = 84) = 2.9, p = .983), the responses also do not differ significantly from each other and thus, again, only slight trends at most can be inferred. It seems that in terms of syntactic and morphological psychotypology, English is also moving away from Dutch here. Overall, English is mentioned less often here for second and third place than for general psychotypology. Danish and Swedish, on the other hand, seem to be moving towards Dutch.

A clearer difference can be seen in German-speaking learners of L3 Dutch in terms of the languages in first and second place for general, syntactic and morphological psychotypology. With regard to syntactic (72%) and morphological (56%) psychotypology, German is put in first place less often than with regard to general psychotypology (87%). In contrast, English (general 5%, syntactic 23%, morphological 36%) is mentioned more often. This difference is significant ($\chi 2$ (4, N = 183) = 18.8, p = .001). In second place, on the other hand, German-speaking learners of Dutch mention English less frequently with respect to syntactic (41%) and morphological (26%) psychotypology than with respect to general psychotypology (67%). Danish (general 18%, syntactic 28%, morphological 23%), German (general 8%, syntactic 16%, morphological 31%) and Swedish (general 2%, syntactic 7%, morphological 10%), on the other hand, are mentioned more often here. We thus see that English is moving towards Dutch and German, and, in terms of morphological psychotypology, English is pushing away German as the language closest to Dutch. This difference is also significant ($\chi 2$ (8, N = 180) = 25.5, p = .001). As for the languages in third place, the responses of German-speaking learners of Dutch for general, syntactic and morphological psychotypology do not differ significantly from each other ($\chi 2$ (10, N = 175) = 7.5, p = .677). Overall, English is thus shifting significantly towards Dutch in terms of syntactic and morphological psychotypology. Especially with regard to morphological psychotypology, we see a clear convergence, eroding the certitude

of German's first-place ranking. However, English does not come between Dutch and German. We see only that the gap between Dutch and German, on the one hand, and English, on the other, is narrowing.

In summary, we can conclude the following: L1 speakers and English-speaking learners of L3 Dutch show no differences between general, syntactic and morphological psychotypology. At most, English-speaking learners of L3 Dutch show a tendency to view English as moving away from Dutch with respect to syntactic psychotypology. German-speaking learners of L3 Dutch view English as moving towards Dutch with respect to syntactic and especially morphological psychotypology.

4.4 Discussion

The central research question of this chapter is:

(SQ.1) What perception do German-speaking and English-speaking learners of L3 Dutch have of the typological proximity between Dutch, German and English?

German-speaking learners, English-speaking learners and L1 speakers of Dutch show no differences regarding their perception of the typological proximity between Dutch, German and English. All three groups clearly place German closer to Dutch than they do English. Thus, they seem to perceive that English, especially in lexical terms, occupies a marginal position within the West Germanic languages. However, L1 speakers of Dutch place English further away from Dutch and German and seem to feel the gap between English and the other West Germanic languages Dutch and German more clearly than German-speaking and English-speaking learners of Dutch.

An explanation for the fact that all three groups put German in first place can be found in the factors that play a role in assessing the typological proximity between Dutch, German and English. These correspond in the three groups. The most important factors are *vocabulary*, *grammar* and *sounds*. The factor *vocabulary* is the most frequently mentioned factor for all three groups. This is consistent with the results of Vismans and Wenzel (2012). German-speaking learners, English-speaking learners and L1 speakers of Dutch therefore agree that German is more closely related to Dutch than English and justify their choice with the factor

vocabulary. It is therefore not surprising that the general psychotypology is based on the lexical proximity between Dutch, German and English. Moreover, expanding vocabulary is a central aspect of learning a foreign language, allowing language learners to perceive lexical differences between languages particularly clearly. This probably means that lexical similarities and differences between Dutch, German and English determine the perception of typological proximity. That lexical similarities and differences play a role in the perception of typological distance is also clear with regard to French, which German-speaking learners of Dutch perceive as close to Dutch; closer even than Swedish. French in particular has strongly influenced the vocabulary of Dutch.

With regard to the position of the North Germanic languages Swedish and Danish compared to Dutch, German and English (SQ.1.1), a clear difference can be seen between German-speaking learners, English-speaking learners and L1 speakers of Dutch. German-speaking and English-speaking learners of L3 Dutch perceive the North Germanic languages Danish and Swedish as less close to the West Germanic languages Dutch, German and English. Vismans and Wenzel (2012) also found this in their results. Moreover, they perceive Swedish as less close to Dutch than Danish. They thus show a historical ranking, within which English stands between Dutch and German, on the one hand, and the North Germanic languages Danish and Swedish, on the other. L1 speakers of Dutch place the North Germanic languages between Dutch and German, on the one hand, and English, on the other. L1 speakers of Dutch therefore show a comparative ranking. As for Danish and Swedish, it is not clear which of these two they perceive as closer to Dutch. The fact that German-speaking and English-speaking learners of Dutch perceive Danish as closer to Dutch than Swedish is to Dutch could also be related to the geographical location of the Scandinavian countries Denmark and Sweden. Denmark is closer to the Dutch language area than Sweden. The fact that geographical locations are used for the perception of typological proximity might be due to the fact that not all participants have knowledge of Danish and Swedish. Therefore, they cannot compare the North Germanic languages with the West Germanic languages and must rely on other criteria.

Why L1 speakers of Dutch show a comparative ranking in which the North Germanic languages take a place between Dutch and German, on the one hand, and English, on the other, might be explained as follows. With regard to Dutch and English, L1 speakers of Dutch tend to have high language levels in both languages. According to the *English Proficiency Index* (EF Education First Ltd, 2022), the

Dutch have the highest English language levels not only in Europe, but worldwide. Moreover, we can assume that Dutch students use both Dutch and English on a daily basis. For example, at the Faculty of Arts of the University of Groningen, where we recruited L1 speakers of Dutch for this study, an English C1 CEFR level must be demonstrated at the start of the study (University of Groningen, 2022). As a result, L1 speakers of Dutch's first language, Dutch, and their English do not differ much in terms of language proficiency and language use. This might result in a high level of metalinguistic awareness among L1 speakers of Dutch. The high level of metalinguistic awareness, but especially the high level of language proficiency in both Dutch and English, might mean that they are better able to compare Dutch and English and identify similarities and differences. As a result, they perceive English as less close to Dutch. Moreover, they perceive English less as a West Germanic language and consider it less close to Dutch than German, Danish and Swedish. The English-speaking learners of L3 Dutch obviously also have high language skills in English. However, their Dutch language levels are relatively low. German-speaking learners of L3 Dutch have average Dutch language skills and, in our data, their English language skills appear to be at upper intermediate level (LexTALE score 74%, *SD* = 13.50). German-speaking learners and English-speaking learners of L3 Dutch do not have the skills in Dutch and English that L1 speakers of Dutch have and are therefore probably less able to compare these languages and identify similarities and differences. As a result, they perceive English as closer to Dutch than L1 speakers of Dutch. In this context, the question arises whether the psychotypology of German-speaking and English-speaking learners of L3 Dutch changes towards the psychotypology of L1 speakers of Dutch as foreign language skills in Dutch and English increase. This requires further research. However, this is complicated by the fact that German-speaking and English-speaking learners of L3 Dutch rarely have the Dutch language skills that L1 speakers of Dutch have in English. After all, English has the status of a lingua franca, Dutch does not.

Further research is also needed to make clear statements about the extent to which the perception of German-speaking learners, English-speaking learners and L1 speakers of Dutch differs from the general, syntactic and morphological distance between Dutch, German and English (SQ.1.3). Besides some trends, we found few significant differences between the general, syntactic and morphological psychotypology. This could be due to the fact that vocabulary is seen as such an important factor in assessing the typological proximity between Dutch, German and

English, that the perceived syntactic proximity and morphological proximity between these languages are also influenced by the lexical proximity. The fact that English-speaking learners of L3 Dutch perceive English as less close to Dutch, especially with regard to syntactic psychotypology, could indicate that they are better able to compare Dutch and English with regards to the concrete linguistic domain syntax. Unlike other Germanic languages, English is not a V2 language. English-speaking learners of Dutch must therefore pay special attention to syntax when learning Dutch to avoid negative transfer. We can assume that they receive feedback on this during the learning process, making them particularly sensitive to the syntactic differences between English and the other Germanic languages, especially German.

The fact that German-speaking learners of L3 Dutch perceive English as closer to Dutch, especially with regard to morphological psychotypology, could indicate that they perceive Dutch to be in the middle position between German and English in terms of morphology. However, also with regard to the syntactic psychotypology of German-speaking learners of L3 Dutch, English is moving towards Dutch, which contradicts the observations we have made about English-speaking learners of L3 Dutch in terms of their syntactic psychotypology. Ultimately, we cannot yet provide a clear answer to the question of whether the perceptions of German-speaking learners, English-speaking learners and L1 speakers of Dutch of the general, syntactic and morphological proximity between Dutch, German and English differ.

4.5 Conclusion

When learning Dutch as an L3, both German and English can positively or negatively influence the acquisition of Dutch, regardless of which of these two is the L1 or L2. Which language has a stronger influence on Dutch depends, among other things, on language learners' perception of the typological proximity between Dutch, German and English. German-speaking (with L2 English) and English-speaking (with L2 German) learners of L3 Dutch perceive German as closer to Dutch than English is to Dutch. This perception in both groups is based on the factor *vocabulary*. This is consistent with the results of Vismans and Wenzel (2012). We found that L1 speakers of Dutch do not differ from German and English learners of L3 Dutch in these respects. However, L1 speakers of Dutch differ from German-speaking and English-speaking learners of L3 Dutch in the languages they perceive

as close to Dutch after German. German-speaking and English-speaking learners of L3 Dutch show a historical ranking, within which English stands between Dutch and German, on one side, and the North Germanic languages Danish and Swedish, on the other. L1 speakers of Dutch show a comparative ranking, within which the North Germanic languages occupy a place between Dutch and German, on one side, and English, on the other. These results have consequences for learning Dutch as an L3 in the German and English language areas. In connection with the Typological Primacy Model (Rothman, 2011) and the more recent recognition of transfer as a conscious and intentional strategy in multilingual education (Cummins, 2008, 2017; Cenoz & Gorter, 2014, 2020), we can now assume that in German-speaking and English-speaking learners of Dutch, German is the language that has the stronger influence (positive and negative) on L3 Dutch. For German-speaking learners of L3 Dutch, German is the L1, and for English-speaking learners of L3 Dutch, German is the L2. German should therefore play a central role in the learning of Dutch as an L3 by these two groups of learners—especially when it comes to promoting positive transfer. Furthermore, learning Dutch as an L3 in the German and English language areas can benefit from a further development of foreign language skills in general and therefore also of the metalinguistic awareness of the learners. This would allow learners to better assess whether Dutch, German and English (and possibly other languages they know) share certain linguistic properties or not. As a result, their psychotypology could change towards the psychotypology of L1 speakers of Dutch and thus reflect a comparative ranking. Further research in this area is needed to better understand the processes of learning Dutch as an L3 in the German and English language areas and thus to promote the learning of L3 Dutch.

CHAPTER 5. PROCESSING AND COMPREHENSION

In this chapter, we present a study on the processing[16] and comprehension of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch. The study investigates L3 morphosyntactic transfer between the closely related West Germanic languages Dutch, German, and English, specifically testing the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) against the Typological Primacy Model (Rothman, 2011, 2015) (see **2.2 Models of L3 Morphosyntactic Transfer**). The overarching research question of this dissertation is:

(RQ) Which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition?

5.1 Introduction

The Typological Primacy Model (Rothman, 2011, 2015) proposes that either the L1 or the L2, but not both, are available for transfer in L3 acquisition, based on typological proximity determined by the internal linguistic parser using hierarchical linguistic cues after enough L3 input (see **2.2.4 Typological Primacy Model**). Based on the typological relationships between Dutch, German and English (see **2.3.2 Typology and Psychotypology**), and the fact that the English lexicon deviates significantly from the Dutch and German lexicons (see **2.2.4 Typological Primacy Model**), we can assume that the linguistic parser chooses German as the source of transfer into L3 Dutch early on in the language learning process. In our study on the psychotypological proximity between Dutch, German and English, we find that the linguistic parser's unconscious perceived typological proximity and the conscious perceived typological proximity of German-speaking and English-

[16] While processing includes both comprehension and production, in this context, processing specifically refers to processing for comprehension.

speaking learners of L3 Dutch, as well as L1 speakers of Dutch, coincide. All three groups perceive German as closer to Dutch than English is to Dutch (see **Chapter 4. Psychotypology**).

The L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), on the other hand, proposes that the L2 is the only source of morphosyntactic transfer into the L3. It is argued that the L2 and L3 are learned in similar ways, whereas the L1 is acquired differently, which is why access to the L1 is blocked. Additionally, it is argued that while the L2 and L3 are stored in the declarative memory system, the L1 is stored in the procedural memory system, again, blocking access to the L1 (Ullman 2001, 2004, 2005; Paradis, 2004, 2009; Bardel & Falk, 2012) (see **2.2.2 L2 Status Factor Hypothesis**).

Based on the literature and the above-mentioned models on L3 morphosyntactic transfer, we have the following hypotheses regarding the processing and comprehension of superlatives and two-verb clusters in Dutch by German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German:

(**H.1**) If the **Typological Primacy Model** best predicts morphosyntactic transfer into the L3, both groups of learners of L3 Dutch will transfer from German, and have faster RTs and higher accuracy rates for the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

(**H.2**) If the **L2 Status Factor Hypothesis** best predicts morphosyntactic transfer into the L3, learners of L3 Dutch with L1 German will transfer from L2 English, and have faster RTs and higher accuracy rates for the syntactic superlative (*de meest natuurlijke appel*) and Auxiliary-Participle clusters (*heeft gedroomd*). Learners of L3 Dutch with L1 English will transfer from L2 German, and have faster RTs and higher accuracy rates for the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

5.2 Method

In order to answer our research questions, we used a combination of offline (timed grammaticality judgement task) and online (self-paced reading task) methods. This

is a novel approach in studying L3 morphosyntactic transfer and, to our knowledge, has only been used by Angelovska et al. (2023) to date. For the grammaticality judgement task, reactions times (RTs) and accuracy data were collected, and for the self-paced reading task, RTs were measured. While offline methods collect information about sentence interpretation after the sentence is read in its entirety, online methods collect information about sentence interpretation as each segment of the sentence is read in real time (Keating & Jegerski, 2015). Online methods are considered, firstly, to provide fine-grained information about sentence processing, since they allow to examine sentence processing at the exact moment a segment of the sentence is read, and, secondly, to reflect implicit knowledge rather than explicit knowledge, since they allow little time for conscious linguistic problem solving (Keating & Jegerski, 2015). Moreover, online methods are considered to be relatively immune to metalinguistic knowledge, since participants do not have time to think about the grammaticality of the sentence (Marinis, 2013). Offline methods, on the other hand, allow participants to think about the sentence before they judge its grammaticality, which allows them to use their metalinguistic knowledge about language and make a conscious decision (Marinis, 2013). Thus, the self-paced reading task provides more fine-grained information on morphosyntactic transfer into the L3 than the grammaticality judgement task. It has been argued that grammaticality judgement tasks also are capable of assessing implicit knowledge if the task is timed, since participants do not have time to access their metalinguistic knowledge (Angelovska et al., 2023). We indeed used a timed grammaticality judgement task in our study. For the self-paced reading task, the basic assumption is that RTs reflect the amount of time needed to process a segment (Jegerski, 2014). It is assumed that comparatively slower RTs at certain segments in a sentence reflect processing difficulties that could relate to the ungrammaticality of the sentence, the violation of an expectation or a reanalysis process, while comparatively faster RTs reflect facilitation (Just et al., 1982; Marinis, 2010; Jegerski, 2014). We argue that in our study comparatively faster RTs in the critical region or the regions immediately following the critical region (i.e., the spillover regions, see **5.2.2 Materials**) of the test items reflect L3 morphosyntactic transfer from the L1 or the L2. Faster RTs for one form compared to the other from reflect relative ease of processing. Relative ease of processing, in turn, suggests that processing and comprehension are influenced by prior language knowledge and that participants rely on morphosyntactic properties from their L1 or L2.

5.2.1 Participants

Four groups of participants took part in the experiment: Two mirror-image participant groups: German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German; and two control groups: English-speaking learners of L2 Dutch and L1 speakers of Dutch. The L1 speakers of Dutch provide a baseline for L1 processing and comprehension. The English-speaking learners of L2 Dutch help identify the influence from L2 German in English-speaking learners of L3 Dutch with L2 German. If L2 German, i.e. a language typologically closer to Dutch than English is to Dutch, is the source of morphosyntactic transfer into the L3 in English-speaking learners of L3 Dutch, we expect different results for the two groups of English-speaking learners of Dutch. Note that German-speaking learners of L2 Dutch do not exist, since, in the German language area, Dutch is typically learned as an L3 after English, which is a compulsory L2 (Nederlandse Taalunie, 2020). All participants reported having normal hearing, normal eyesight and no cognitive impairments. A summary of the demographic details and LexTALE scores for each group is shown in **Table 12**.

Table 12: *Demographic Details and LexTALE Scores for Participants of Processing and Comprehension Study*

Group	No.	Age			Gender				LexTALE	
		Mean	SD	Range	Female	Male	Divers	No answer	L2	Dutch
German-speaking learners of L3 Dutch with L2 English	36	24.86	4.30	19-38	25	10	1	0	73.18%	67.18%
English-speaking learners of L3 Dutch with L2 German	15	23.40	6.27	18-40	9	6	0	0	65.72%	63.57%
English-speaking learners of L2 Dutch	12	23.83	13.05	18-65	7	5	0	0	-	61.52%
L1 speakers of Dutch	47	21.98	2.25	18-28	29	16	2	0	-	-

All but one of the German-speaking learners of L3 Dutch with L2 English were students at German universities (University Oldenburg, University Münster, Free University Berlin, University Cologne and University Duisburg-Essen). One of them reported having more than one L1: German, Russian and Sign Language. All

of them learned English as a true L2 and Dutch after English. Students who had another West Germanic L1 in addition to German were not permitted to take part in the study.

All but three of the English-speaking learners of L3 Dutch with L2 German were students at British and American universities, most of them University of Sheffield, but also University of Newcastle upon Tyne, University of California, Berkeley, Stanford University, Columbia University and New York University. The data from one of the original 16 participants were excluded because they did not differentiate between grammatical and ungrammatical fillers. Two of the 15 remaining participants reported having more than one L1: English and Chinese, and English, Konkani and Hindi. Five of them learned German as a true L2, nine after learning one or more Romance languages, and one after learning Greek. All participants learned Dutch after learning German.

All but two of the English-speaking learners of L2 Dutch were students at British and American universities (see English-speaking learners of L3 Dutch with L2 German above). The data from three of the original 15 participants were excluded due to a high number of NAs (*no answer*) for the responses on the grammatical judgement task. Two of the 12 remaining participants learned Dutch as a true L2, nine after learning one or more Romance languages and one after learning Irish and two Romance languages.

All but one of the L1 speakers of Dutch were students at Dutch universities, most of them University of Groningen. The data from one of the original 48 participants were excluded due to a high number of NAs for the responses on the grammatical judgement task. Six of the 47 remaining participants reported having more than one L1: Four Dutch and Frisian[17], one Dutch and Twents, and one Dutch and Russian. All participants have relatively good knowledge of English (self-assessment: $M = 1.42$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.57$), and all but three also have some knowledge of German (self-assessment: $M = 3.27$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.86$).

All participants gave their consent prior to the experiment after being informed in writing. Their participation in this study was anonymous and they received financial compensation for their participation. This study was approved by the

[17] To be complete, in Frisian, word order in two-verb clusters is Participle-Auxiliary by default (Wurmbrand, 2004).

Research Ethics Review Committee (CETO) of the Faculty of Arts of the University of Groningen.

5.2.2 Materials

We created 24 test items with two conditions each: 12 superlative test items with conditions (a) morphological superlative and (b) syntactic superlative, and 12 two-verb cluster test items with conditions (a) Participle-Auxiliary cluster and (b) Auxiliary-Participle cluster. This resulted in 48 declarative sentences. Examples of the test items are presented in (9) and (10):

9.

a. Zij denkt dat de wilde appel de **natuurlijkste** appel van alle appels is.
‘She thinks that the wild apple is the most natural apple of all apples.’

b. Zij denkt dat de wilde appel de **meest natuurlijke** appel van alle appels is.
‘She thinks that the wild apple is the most natural apple of all apples.’

10.

a. Ik denk dat de student **gedroomd heeft** en de professor niet.
‘I think that the student has dreamed and the professor has not.’

b. Ik denk dat de student **heeft gedroomd** en de professor niet.
‘I think that the student has dreamed and the professor has not.’

The test items were lexically matched to ensure maximal comparability, only differing with regard to the critical regions, that is, the region of interest (see (**9**) *natuurlijkste* vs. *meest natuurlijke*, and (10) *gedroomd heeft* vs. *heeft gedroomd*). Matching the segments before and after the critical regions avoids spillover effects from the regions before the critical regions onto the critical, and also enables identification of processing difficulties of the critical region which might spill over onto regions after the critical regions (Keating & Jegerski, 2015). The lexical material of the test items consisted of cognates between Dutch, German and English. For this, we consulted the website *etymologiebank.nl* (van der Sijs, 2010). The only exception was *hij* (German: *er*, English: *he*): *hij* is highly frequent in Dutch and was included next to the pronouns *ik* (German: *ic*h, English: *I*) and *zij*

(German: *sie*, English: *she*) in two-verb cluster test items to avoid repetition. In addition, the lexical material of the test items only consisted of high-frequency words, based on the top 5,000 words of the Hazenberg and Hulstijn list (Hazenberg & Hulstijn, 1996). All constituents of the test items were matched in number of syllables. By using only cognates and high-frequency words, and matching syllable numbers of constituents, we eliminated the possibility that slower RTs were due lack of knowledge of the lexical material or differences in syllable number. For two-verb cluster test items, only auxiliaries were used, no modals, and we always used the auxiliary *heeft* (*has*).

The adjectives and verbs for the critical regions were carefully chosen based on the *Groningen Twitter Corpus* (Bouma, 2015). We compiled lists with Dutch superlatives and two-verb clusters from the corpus. We controlled for frequency of superlatives and two-verb clusters in the *Groningen Twitter Corpus*, grammar/spelling, nativeness to Dutch, cognate status with German and English, affix structure (i.e., only adjectives without suffixes *-isch*, *-s*, *-sd*, *-st*, *-sk* and *-de*, and only participles with prefix *-ge*) and frequency in the top 5,000 words of the Hazenberg and Hulstijn list (Hazenberg & Hulstijn, 1996). For superlatives, in addition, frequency of use with both the definite articles *de* (*the*, masculine and feminine) and *het* (*the*, neuter) in the *Groningen Twitter Corpus* was controlled for, as well as number of syllables in Dutch, German and English (i.e., only trisyllabic and polysyllabic adjectives). For two-verb clusters, in addition, intransitivity and occurrence with an agentive subject was a requirement for selection, which was necessary due to the syntactic structure of the two-verb cluster test items. For the complete item selection process, see Chapter **3.3 Item Selection: Groningen Twitter Corpus**. Finally, we obtained grammaticality and plausibility judgements from five colleagues in Dutch Studies with L1 Dutch, confirming the grammaticality and plausibility of both the superlative and two-verb cluster test items.

We used different types of distractor items and filler items for the experiment. The distractor items were part of another experiment investigating subject/object asymmetries in long-distance wh-questions and consisted of 96 sentences: 48 grammatical sentences (see examples in **11.a** and **11.b**) and 48 ungrammatical sentences with a mild violation (see examples in **11.c** and **11.d**).

11.

a. Wie denk je dat de mensen ziet?
‘Who do you think sees the people?’

b. Wie denk je dat de mensen zien?
‘Who do you think the people see?’

c. Wat denk je wie de mensen ziet?
‘What do you think who sees the people?’

d. Wat denk je wie de mensen zien?
‘What do you think who the people see?’

All 96 distractor items were interrogative sentences. The fillers items, unrelated to the target structure, consisted of 48 sentences: 12 grammatical sentences (see examples in **12.a** and **12.b**), 12 ungrammatical sentences with a mild violation (see examples in **12.c** and **12.d**) and 24 ungrammatical sentences with a strong violation (see examples in **12.e** and **12.f**). The ungrammatical sentences had a variety of different violations, such as incorrect gender or verb agreement, or incorrect word order.

12.

a. Ik denk dat de auteur aan de tekst werkt en de journalist niet.
‘I think that the author is working on the text and the journalist is not.’

b. Wat heeft de student in de school gezocht?
‘What has the student looked for in the school?’

c. *Zij gelooft dat **het** grote danser creatief is.
Zij gelooft dat **de** grote danser creatief is.
‘She believes that the tall dancer is creative.’

d. *Welke oude professor **zijn** briljant?
Welke oude professor **is** briljant?
‘Which old professor is brilliant?’

e. *Zij vindt dat **de foto grote** leuk is.
Zij vindt dat **de grote foto** leuk is.
'She thinks that the big picture is nice.'

f. *Welke passagier denkt dat de piloot **van storm de** droomt?
Welke passagier denkt dat de piloot **van de storm** droomt?
'Which passenger thinks that the pilot dreams of the storm?'

Twenty-four filler items were declarative sentences; 24 filler items were interrogative sentences. This resulted in a list of 192 items in total (see **Appendix C: Items Processing and Comprehension Study**). This experiment required two experimental lists. Each list contained all of the filler items (48), a quarter of the distracter items (24) and half of the test items (12 for superlatives and 12 for two-verb clusters). The final list contained 48 declarative sentences and 48 interrogative sentences which adds up to 96 items in total participants had to read. The items were randomised and the lists were counterbalanced, thus, participants never saw both conditions of the same test item, to ensure that participants did not become aware of the targets and to counteract individual differences in RTs (Jegerski, 2014).

5.2.3 Procedure

We conducted a self-paced reading task followed directly by a timed grammaticality judgement task to investigate both real-time language processing and participants' explicit grammatical knowledge. For this purpose, we employed the E-Prime 3.0 software (Psychology Software Tools, 2016) and the E-Prime Go (Psychology Software Tools, 2020) application, enabling remote testing of participants. The whole experiment was conducted over the internet. Before the experimental task, participants filled in a questionnaire. The questionnaire consisted of questions on hearing, vision, cognitive disorders, handedness, age, gender, L1(s) and foreign languages, age of onset and years of acquisition of foreign languages, self-assessment L2 (English/German/Dutch) and L3 (Dutch) and professional activity (see **Appendix B: Questionnaire Personal and Linguistic data**).

The order of the task as described here was the same for all participants. The task started with a short paragraph of the Dutch children`s story *Jip en Janneke*

spelen samen (*Jip en Janneke play together*) by Dutch author Annie M. G. Schmidt, which did not include superlatives or verb clusters, with the aim of activating participants' Dutch lexicon and grammar (see Grosjean (2001, 2010) for a discussion on the activation and deactivation of languages and the concept of *language modes*). This was followed by instructions in Dutch. For the exact wording of the instructions see **Appendix D: Participant Instructions Processing and Comprehension Study**. To familiarise participants with the technique, this was followed by a practice session with eight practice items, unrelated to the target structures, before starting the experimental session. Participants received feedback during the practice session, but not during the experimental session. Participants would first see the sentence appear on the screen as a series of underscores masking the actual segments of the sentence. They could then make the individual segments appear one by one by pressing the spacebar until they reached the end of a sentence. The segments consisted of the individual words of the sentences. The last segment consisted of the punctuation mark. We used a word-by-word linear non-cumulative presentation, that is, a variant of the *moving-window* technique (Just et al., 1982), which means that words disappear each time a new word appears on the screen (Marinis, 2010). This technique allowed us to identify the specific segment of processing difficulty. **Figure 7** shows an example of the word-by-word self-paced reading task.

Figure 7: *Word-By-Word Self-Paced Reading Task*

```
1. Ik ____ ___ __ _______ ________ _____ __ __ _________ ____ _
2. __ denk ___ __ _______ ________ _____ __ __ _________ ____ _
3. __ ____ dat __ _______ ________ _____ __ __ _________ ____ _
4. __ ____ ___ de _______ ________ _____ __ __ _________ ____ _
5. __ ____ ___ __ student ________ _____ __ __ _________ ____ _
6. __ ____ ___ __ _______ gedroomd _____ __ __ _________ ____ _
7. __ ____ ___ __ _______ ________ heeft __ __ _________ ____ _
8. __ ____ ___ __ _______ ________ _____ en __ _________ ____ _
9. __ ____ ___ __ _______ ________ _____ __ de _________ ____ _
10.__ ____ ___ __ _______ ________ _____ __ __ professor ____ _
11.__ ____ ___ __ _______ ________ _____ __ __ _________ niet _
12.__ ____ ___ __ _______ ________ _____ __ __ _________ ____ .
```

After the self-paced reading task, participants would see the phrase *Goed?* (*Correct?*) appear on the screen, as part of the grammaticality judgement task. We used a binary response scale (*yes*/*no*). Participants with a QWERTZ keyboard had

to press the button *y* for *yes* and *n* for *no*. Participants with a QWERTY keyboard had to press the button *z* for *yes* and *n* for *no*. Responses were limited to two seconds. If participants did not answer within two seconds, they would see the phrase *Te langzaam!* (*Too slow!*) and the next trial would start. For both the self-paced reading task and the grammaticality judgement task, the E-Prime 3.0 software recorded RTs in milliseconds for every keypress (spacebar and *y*/*z* and *n)*. The task consisted of 96 sentences that were divided into two blocks of 48 sentences. Between each block, the experiment would pause for one minute after which participants could continue the experiment whenever they were ready. Participants needed around 30 minutes to complete the task.

After the experimental task, German-speaking participants took the English (L2) and Dutch (L3) version of the LexTALE test; English-speaking participants took the German (L2) and Dutch (L3) version of the LexTALE test (see **4.2.3 Procedure**). Note that English-speaking learners of L2 Dutch without knowledge of German took both tests, too. Finally, German-speaking learners, English-speaking learners and native speakers of Dutch completed a questionnaire. This questionnaire included questions on the psychotypology of the participants (i.e., the language learners' perception of the typological proximity between the languages in question (Kellerman, 1983)) in their respective native language (see **Appendix A: Questionnaire Psychotypology**). Results show that German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L2 Dutch perceive German as closer to Dutch than English is to Dutch (see **Chapter 4. Psychotypology**).

5.2.4 Analysis: Grammaticality Judgement Task

The data were statistically analysed with *R* (R Core Team, 2023). The grammaticality judgement scores were analysed by means of binomial generalised linear mixed-effects models and the reaction time (RT) data to the grammaticality judgements were analysed by means of linear mixed-effects models, using the package *lme4* (Bates et al., 2015). For the RTs to the grammaticality judgements, we ran the Box-Cox procedure (Box & Cox, 1964) to determine which transformation should be applied. We always used the exact lambda value as specified in the respective models to transform the data. We checked whether transforming the data was warranted by checking model assumptions of models with and without the transformation: Models with transformation met model

assumptions much better, so we used these for our final analysis. We checked model assumptions using the *performance* package (Lüdecke et al., 2021). For both the grammaticality judgement scores and the RTs to the grammaticality judgements we used the fixed effects Condition and Group. Condition always had two levels, which we sum-contrast coded. For the two-verb clusters, Participle-Auxiliary was coded -1 and Auxiliary-Participle 1. For the superlatives, the morphological superlative was coded -1 and the syntactic superlative 1. So, the form used in German was always coded -1 and the form used in English 1. For Group, we used reverse Helmert contrast coding, using the package *stats* (R Core Team, 2023), with the following contrasts:

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER
- Group3: L2_DUT_L1_ENG, L3_DUT_L1_ENG & L3_DUT_L1_GER vs. L1_DUT.

Reverse Helmert contrast coding compares each level of Group to the mean of previous levels of Group. The first group hence reflects the contrast between English-speaking learners of Dutch as either L2 or L3, the second group reflects the contrast between English-speaking learners of Dutch and German-speaking learners of L3 Dutch, and, finally, the third group reflects the contrast between learners of Dutch and L1 speakers of Dutch.

To investigate the main effect for Group and Condition, and the interaction between Group and Condition, we performed pairwise comparisons using the *emmeans* package (Lenth, 2021) with Tukey adjustments for multiple hypothesis testing. We added random intercepts and slopes for Subject and Itemset to the models and kept the random effect structure as maximal as possible (Barr et al., 2013), only removing terms when the models would not converge or when the correlations between the random effect components were +/-1. To extract model coefficients by Subject and by Itemset, we used the function *coef* in R (Chambers & Hastie, 1992). For models including both a by-subject intercept and a by-subject random slope for Condition, we extracted by-subject coefficients for the effect of Condition. For models with only a by-subject intercept, we extracted by-subject coefficients for the intercept. In these cases, the effect of Condition is the same across all participants, however, there is variation around the average intercept. As this is not informative regarding the effect of Condition, we do not report by-subject coefficients for the intercept. This principle generally applies to model coefficients

by Itemset as well. However, there was very little variation among itemsets, which was also revealed by the random effect structure or random effects coefficients of the models. This is why we do not report model coefficients by Itemset. Note that in this dissertation we are analysing group data and not individual participant variation, although individual variation could also have been analysed. We always added the covariates Trial Order (coded SeqTrial.c) and List to the maximal model and checked whether it should be included in the model by performing model comparisons (see Baayen et al., 2008). For grammaticality judgement RTs, Seqtrial.c always significantly improved the model fit and was therefore included in the final models, but List did not. The estimate of SeqTrial.c was always negative, indicating that responses were slower as the experiment progressed. For grammaticality judgement scores, both Seqtrial.c and List did not improve the model fit. We also tested whether the LexTALE scores for Dutch or the L2 (German/English) should be added to the models as covariates by means of model comparisons, in order to test for an effect of L3 proficiency (coded LextaleDUT) and L2 proficiency (coded LextaleL2) in L3 morphosyntactic transfer. Since we only had LexTALE scores for non-native speakers, we ran a new model with only the three groups of non-native speakers using reverse Helmert contrast coding for group again, with the following contrasts (see above):

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER

For the grammaticality judgement scores of the two-verb cluster test items, LextaleDUT significantly improved the model fit, but LextaleL2 did not. For the grammaticality judgement scores of the superlative test items, we did not run separate analysis for the learners of Dutch (see Chapter 6. Results). For the grammaticality judgement RTs on both properties, neither LextaleDUT nor LextaleL2 significantly improved the model fit and therefore neither was included in the final models.

5.2.5 Analysis: Self-Paced Reading

The data were statistically analysed with *R* (R Core Team, 2021). The reaction time (RT) data were analysed using linear mixed-effects models, using the package *lme4* (Bates et al., 2015). We did minimal a priori trimming of the data, excluding only

RTs below 100 ms and above 6,000 ms. For the **critical region** (CR) of the two-verb cluster data, we computed aggregated RTs for the auxiliary and the participle, so that we could analyse the RTs for the whole two-verb clusters instead of the auxiliary and participle separately, thus avoiding effects of difference in number of syllables between the auxiliary and the participle. For the critical region of the syntactic superlatives, we added the RTs for the intensifier *meest* (*most*) to those of the adjective following it, so that we had aggregated RTs of the intensifier and the adjective, which we compared to the adjective-suffix single segment in the morphological superlatives. For the spillover region (SR) and the post-spillover region (PSR) of the two-verb cluster items (**13**) and superlative test items (14), we computed aggregated RTs when necessary: For the two-verb clusters' post-spillover region, we computed aggregated RTs for the determiner (de) and the noun (professor). For the superlatives' post-spillover region II (PSR-II), we computed aggregated RTs for the determiner (alle) and the noun (appels). Note that only the critical regions differ in the two conditions of the superlative and two-verb cluster test items.

13.

a. Ik denk dat de student
(CR) gedroomd heeft (SR) en (PSR) de professor niet.

b. Ik denk dat de student
(CR) heeft gedroomd (SR) en (PSR) de professor niet.

14.

a. Zij denkt dat de wilde appel de
(CR) natuurlijkste (SR) appel (PSR) van (PSR-II) alle appels is.

b. Zij denkt dat de wilde appel de
(CR) meest natuurlijke (SR) appel (PSR) van (PSR-II) alle appels is.

To determine which transformation should be applied, we ran the Box-Cox procedure (Box & Cox, 1964). We always used the exact lambda value as specified in the respective models to transform the data. We checked whether transforming the data was warranted by checking model assumptions of models with and without the transformation: For all regions of interest (critical regions, spillover regions, post-spillover regions and the superlative's post-spillover region II), models with

transformation met model assumptions much better, so we used these for our final analysis. We checked model assumptions using the *performance* package (Lüdecke et al., 2021). The fixed effects in the models were Condition and Group. Condition had two levels and was sum-contrast coded. For the two verb-clusters, Participle-Auxiliary was coded -1 and Auxiliary-Participle 1. For the superlatives, the morphological superlative was coded -1 and the syntactic superlative 1. So, the form used in German was always coded -1 and the form used in English 1. For Group, we used reverse Helmert coding with the following three contrasts (see above):

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER
- Group3: L2_DUT_L1_ENG & L3_DUT_L1_ENG & L3_DUT_L1_GER vs. L1_DUT.

Pairwise comparisons for Group and Condition, and interactions between Group and Condition were performed using the *emmeans* package (Lenth, 2021), using Tukey adjustments for multiple hypothesis testing. We added random intercepts and slopes for Subject and Itemset to the models and kept the random effect structure as maximal as possible (Barr et al., 2013), only removing terms when the models would not converge or when the correlations between the random effect components were +/-1. To extract model coefficients by Subject and by Itemset, we used the function *coef* in R (Chambers & Hastie, 1992) (see **5.2.4 Analysis: Grammaticality Judgement Task**). For the data on superlatives, we report model coefficients for the spillover region, and for the data on two-verb clusters, we report model coefficients for the critical region, as these regions each provide relevant results for the study (see **5.3 Results**). The covariates Trial Order (coded SeqTrial.c) and List were always added to the maximal model and tested for warranted inclusion by model comparisons (see Baayen et al., 2008). Seqtrial.c always significantly improved the model fit and was therefore included in the final models, but List did not. The estimate of SeqTrial.c was always negative, indicating that responses were slower as the experiment progressed. For the superlative RTs, in addition, the covariate Word Length (word length of the aggregated syntactic superlative (i.e., intensifier *meest* and adjective) and word length of the morphological superlative (i.e., adjective and morpheme *-st*), respectively; coded WordLength) was tested for warranted inclusion by model comparison. WordLength significantly improved the model fit for the critical region only and

was on this basis included in the final model. For the spillover region, post-spillover region and the post-spillover region II, WordLength did not significantly improve the model fit. We also tested whether the LexTALE scores for Dutch or the L2 (German/English) should be added to the models as covariates by means of model comparisons, in order to test for an effect of L3 proficiency (coded LextaleDUT) and L2 proficiency (coded LextaleL2) in L3 morphosyntactic transfer. Since we only had LexTALE scores for non-native speakers, we ran new models with only the three groups of non-native speakers using reverse Helmert contrast coding with the following contrast (see above):

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER

Both LextaleDUT and LextaleL2 did not improve the model fit and were therefore not included in the final models.

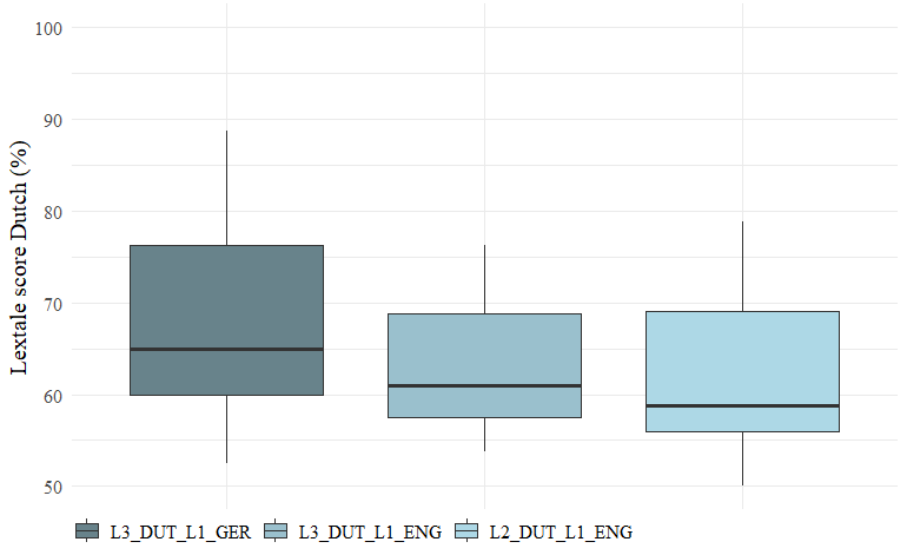
5.3 Results

In this chapter, we firstly present the results on language proficiency of the German-speaking learners of L3 Dutch with L2 English, English-speaking learners of L3 Dutch with L2 German, and the English-speaking learners with L2 Dutch. After that, we present our results of the learners and L1 speakers of Dutch on the grammaticality judgement task. Finally, we present our results of the learners and L1 speakers of Dutch on the self-paced reading task.

5.3.1 Language Proficiency

The LexTALE scores for Dutch for the three groups of learners of Dutch are shown in **Figure 8**. For German-speaking learners of Dutch with L2 English, and English-speaking learners of Dutch with L2 German, Dutch is the L3 after L1 German/English and L2 English/German; and for English-speaking learners of Dutch without knowledge of German, Dutch is the L2 after L1 English. The LexTALE scores for the L2 for German-speaking (L2 English) and English-speaking (L2 German) learners of L3 Dutch are shown in **Figure 9**.

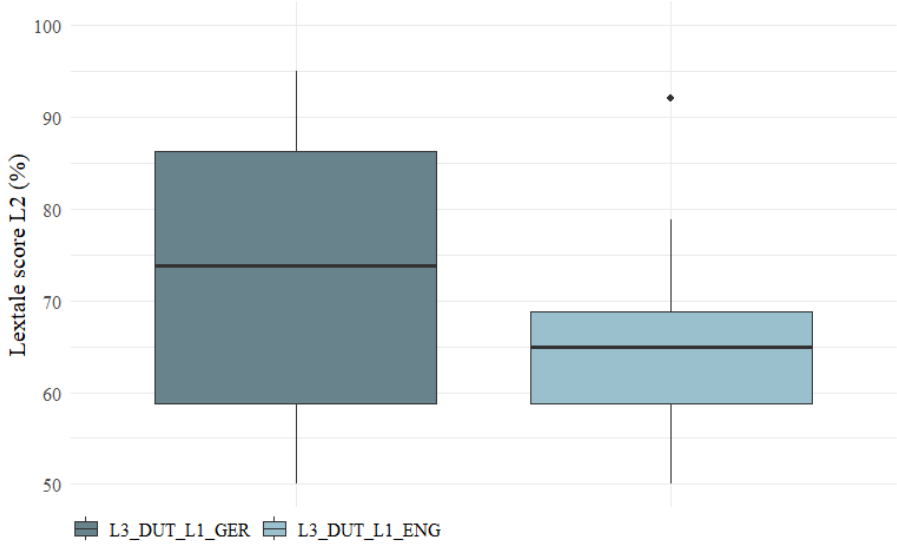
Figure 8: *LexTALE Scores for L3 Dutch for German-Speaking Learners with L2 English and English-Speaking Learners with L2 German, and LexTALE Scores for L2 Dutch for English-Speaking Learners*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch.

The LexTALE score for Dutch was *M* = 67.18, *SD* = 10.02, 95% CI [66.84, 67.52], (upper intermediate) for German-speaking learners of L3 Dutch, *M* = 63.57, *SD* = 7.17, 95% CI [63.20, 63.94], (upper intermediate) for English-speaking learners of L3 Dutch, and *M* = 61.56, *SD* = 8.23, 95% CI [61.09, 62.04], (upper intermediate) for English-speaking learners of L2 Dutch. Pairwise comparisons between Group showed that all three groups significantly differed from each other in terms of LexTALE scores for Dutch (*p* = < .001).

Figure 9: *LexTALE Scores for L2s for Learners of L3 Dutch, English and German, Respectively*



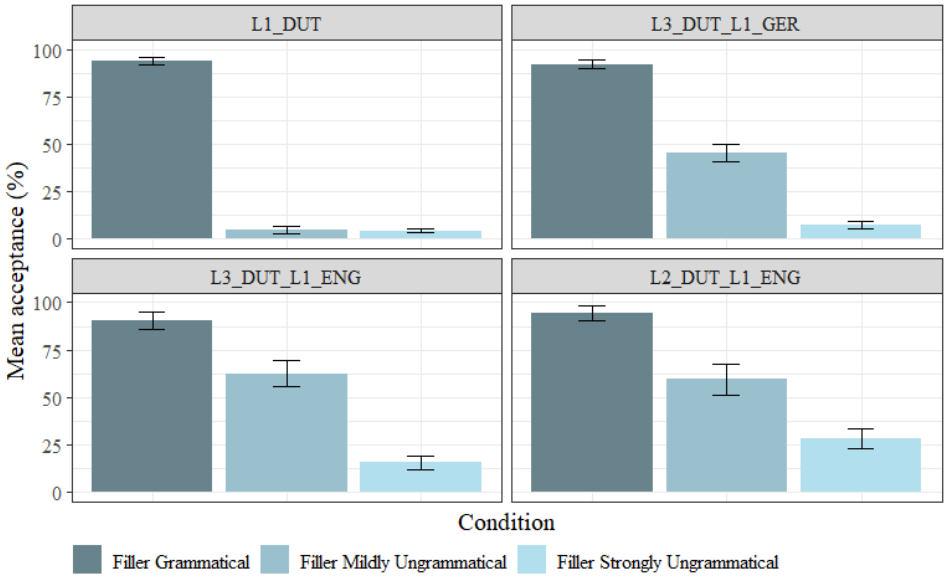
L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English; L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German.

The LexTALE score for L2 English was *M* = 73.18, *SD* = 13.71, 95% CI [72.71, 73.64], (upper intermediate) for German-speaking learners of L3 Dutch, and for L2 German *M* = 65.72, *SD* = 10.11, 95% CI [65.19, 66.24], (upper intermediate) for English-speaking learners of L3 Dutch. Again, pairwise comparisons between Group showed that the two groups significantly differed from each other in terms of LexTALE scores for the L2 (p = < .001).

5.3.2 Grammaticality Judgement Scores: Filler Items

The results of the grammaticality judgement scores for the filler items are shown in **Figure 10**.

Figure 10: *Filler Items: Grammaticality Judgement Score Means and 95% Confidence Intervals*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch

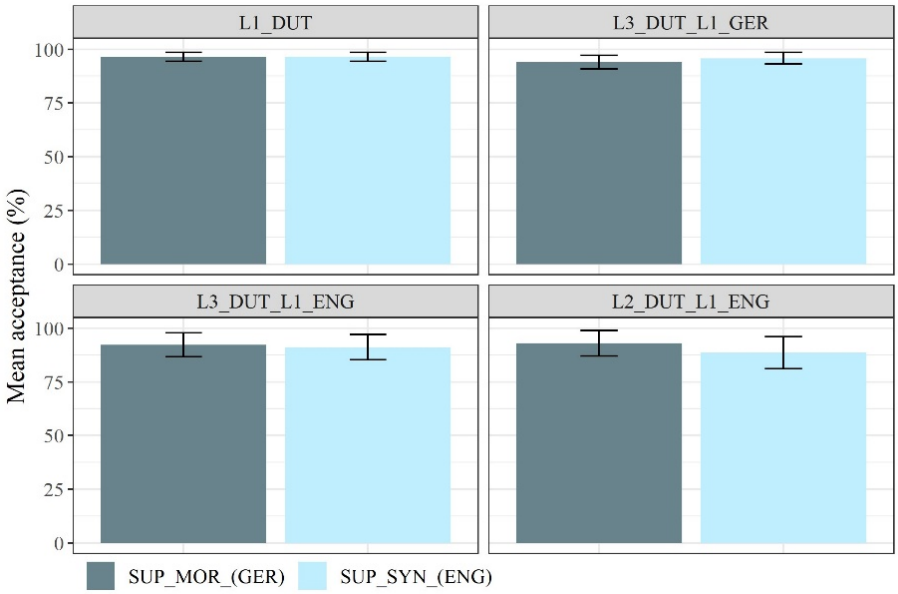
As can be seen in **Figure 10**, the grammatical filler items had a high degree of acceptance in all four groups: L1 speakers of Dutch: M = 93.77, SD = 0.24; German-speaking learners of L3 Dutch: M = 92.31, SD = 0.27; English-speaking learners of L3 Dutch: M = 90.50, SD = 0.29; English-speaking learners of L2 Dutch: M = 94.45, SD = 0.23. For the grammatical filler items, there was no significant difference between the groups (p = .398). The mildly ungrammatical filler items were not accepted in L1 speakers of Dutch (M = 5.00, SD = 0.22), and accepted in about 50% of cases in German-speaking and English-speaking learners of Dutch (German-speaking learners of L3 Dutch: M = 45.58, SD = 0.50; English-speaking learners of L3 Dutch: M = 62.57, SD = 0.48; English-speaking learners of L2 Dutch: M = 59.57, SD = 0.49). For the mildly ungrammatical filler items, there was a significant difference between L1 speakers of Dutch and all three groups of learners of Dutch (p = < .001). Furthermore, there was a significant difference between German-speaking learners of L3 Dutch, on the one hand, and English-speaking

learners of L3 Dutch (p = < .001) as well as English-speaking learners of L2 Dutch (p = .002), on the other. The strongly ungrammatical filler items had a low degree of acceptance in all four groups: L1 speakers of Dutch: M = 4.54, SD = 0.21; German-speaking learners of L3 Dutch: M = 7.58, SD = 0.27; English-speaking learners of L3 Dutch: M = 15.54, SD = 0.36; English-speaking learners of L2 Dutch: M = 28.11, SD = 0.45. For the strongly ungrammatical filler items, there was a significant difference between L1 speakers of Dutch and both groups of English-speaking learners of Dutch (p = < .001). Above that, there was a significant difference between all three groups of learners of Dutch (p = < .001). Within the four groups, there are significant differences between the three types of filler items (p = < .001), except for mildly and strongly ungrammatical filler items in L1 speakers of Dutch (p = .913). Overall, participants were sensitive to grammatical and ungrammatical filler items, indicating that the task worked as intended.

5.3.3 Grammaticality Judgement Scores: Superlatives

The results of the grammaticality judgement scores for the superlatives are shown in **Figure 11**, the by-subject coefficients for the effect of condition are shown in **Figure 12**, and the results of the final model with the results of the statistical analysis are summarised **Table 13**.

Figure 11: *Superlatives: Grammaticality Judgement Score Means and 95% Confidence Intervals*

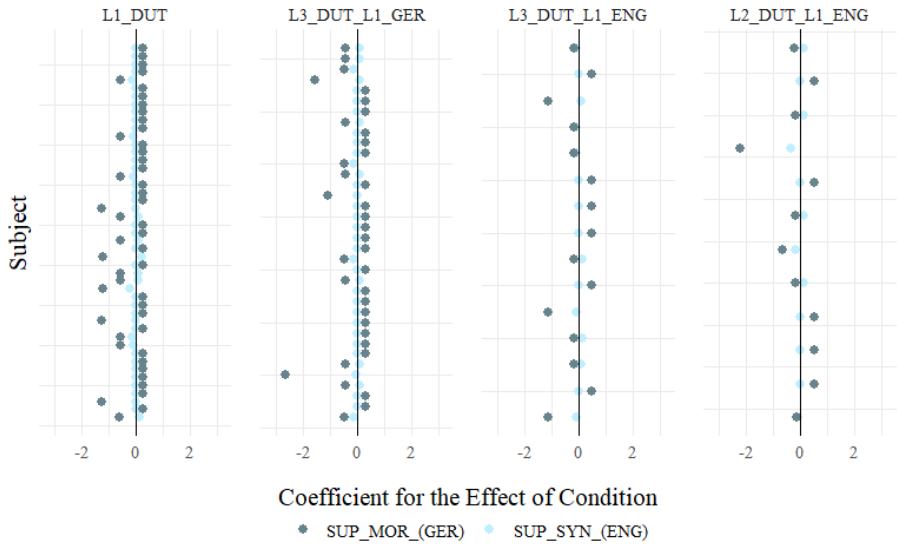


L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives.

Table 13: *Superlatives: Model Summary for Grammaticality Judgement Scores*

Model: Response ~ Group * Condition + (1 + Condition || Subject) + (1 + Condition || Itemset)			
Model component	Estimate	Standard error	z-value
Intercept	3.29	0.21	15.33 ***
Group1	0.01	0.31	0.02
Group2	0.23	0.15	1.55
Group3	0.19	0.10	2.01*
Condition1	-0.03	0.15	-0.23
Group1:Condition1	0.11	0.23	0.49
Group2:Condition1	0.14	0.12	1.18
Group3:Condition1	0.02	0.08	0.22

Figure 12: *Superlatives: By-Subject Coefficients for the Effect of Condition for Grammaticality Judgement Scores*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives.

As can be seen in **Figure 11**, both the morphological superlative and the syntactic superlative had a high degree of acceptance in all four groups: L1 speakers of Dutch: morphological superlative: *M* = 96.44, *SD* = 0.19, syntactic superlative: *M* = 96.45, *SD* = 0.19; German-speaking learners of L3 Dutch: morphological superlative: *M* = 93.93, *SD* = 0.24, syntactic superlative: *M* = 95.81, *SD* = 0.20; English-speaking learners of L3 Dutch: morphological superlative: *M* = 92.22, *SD* = 0.27, syntactic superlative: *M* = 91.11, *SD* = 0.29; English-speaking learners of L2 Dutch: morphological superlative: *M* = 93.06, *SD* = 0.26, syntactic superlative: *M* = 88.57, *SD* = 0.32. Thus, both forms of the superlative, the morphological form *natuurlijkste* and the syntactic form *meest natuurlijke* are accepted by all groups.

As can be seen in **Figure 12**, there is some individual variation in the grammaticality judgement scores for the morphological superlative across all four groups. Participants with positive coefficients rate the morphological superlative as grammatical more often than the average participant. Participants with negative

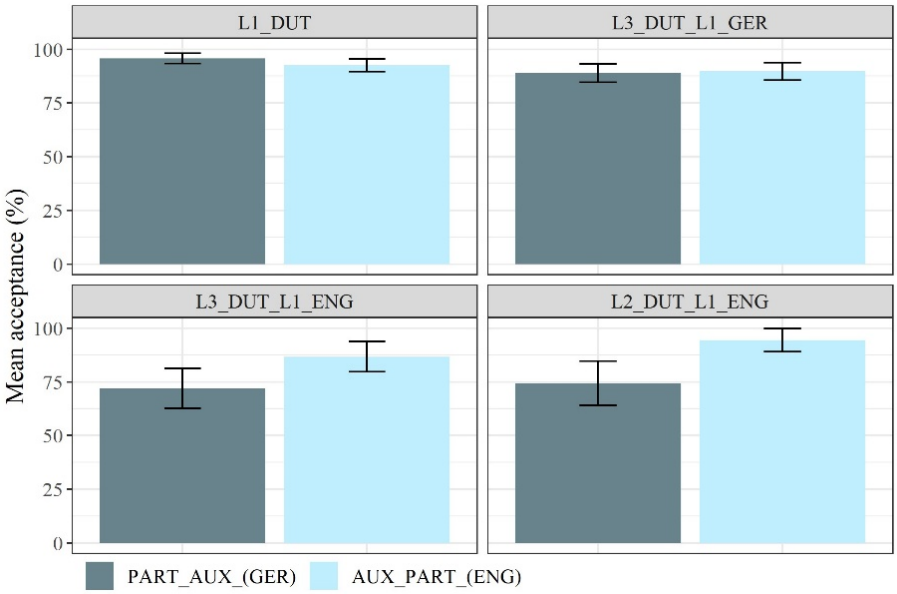
coefficients rate the morphological superlative as grammatical less often than the average participant. Thus, in general, the morphological superlative had a high degree of acceptance, however, some participants have lower acceptability scores compared to the mean. For the syntactic superlative, there is no variation across the groups.

For the grammaticality judgement scores of the superlatives, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). The significant contrast for Group3 indicates that L1 speakers of Dutch overall had higher acceptance rates than learners of Dutch. Post-hoc pairwise comparisons between the different levels of Group were all non-significant. Since there were no differences between and within the learners of Dutch, we did not run separate analyses for the learners of Dutch including LexTALE scores for Dutch and the L2 (English/German) as covariates. Furthermore, there was no main effect for Condition and there were no significant interactions between Group and Condition.

5.3.4 Grammaticality Judgement Scores: Two-verb clusters

The results of the grammaticality judgement scores for the two-verb clusters are shown in **Figure 13**, the by-subject coefficients for the effect of condition are shown in **Figure 14**, and the results of the final model with the results of the statistical analysis are summarised in **Table 14**.

Figure 13: *Two-Verb Clusters: Grammaticality Judgement Score Means and 95% Confidence Intervals*

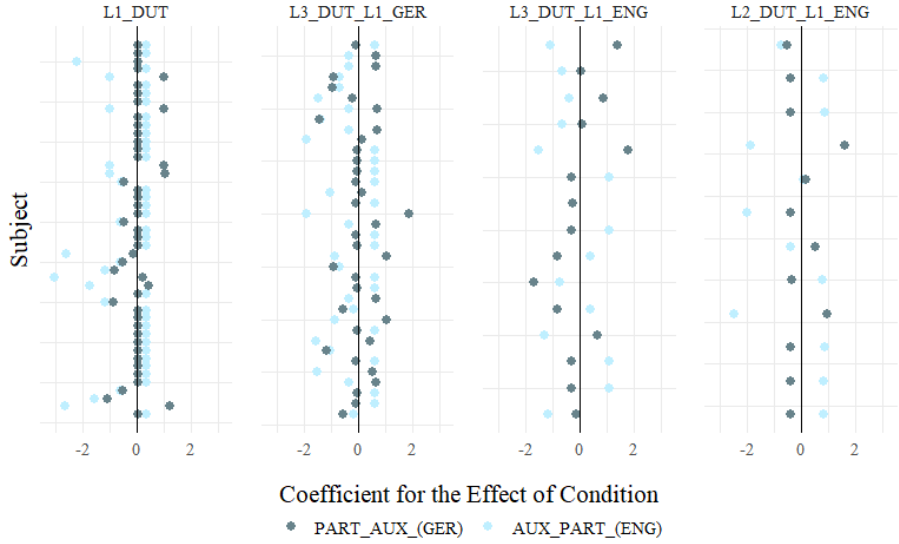


L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

Table 14: *Two-Verb Clusters: Model Summary for Grammaticality Judgement Scores*

Model: Response ~ Group * Condition + (1 + Condition | Subject) + (1 + Condition || Itemset)			
Model component	Estimate	Standard error	z-value
Intercept	3.01	0.23	13.08 ***
Group1	-0.37	0.36	-1.02
Group2	0.21	0.16	1.32
Group3	0.35	0.11	3.16 **
Condition1	0.21	0.19	1.09
Group1:Condition1	-0.26	0.32	-0.82
Group2:Condition1	-0.26	0.14	-1.87 ·
Group3:Condition1	-0.25	0.10	-2.51 *

Figure 14: *Two-Verb Clusters: By-Subject Coefficients for the Effect of Condition for Grammaticality Judgement Scores*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

As can be seen in **Figure 13**, both Participle-Auxiliary and the Auxiliary-Participle were accepted in all four groups, however, to different degrees: L1 speakers of Dutch: Participle-Auxiliary: $M = 95.71$, $SD = 0.20$, Auxiliary-Participle: $M = 92.55$,

SD = 0.26; German-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 88.89, *SD* = 0.31, Auxiliary-Participle: *M* = 89.72, *SD* = 0.30; English-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 71.91, *SD* = 0.45, Auxiliary-Participle: *M* = 86.67, *SD* = 0.34; English-speaking learners of L2 Dutch: Participle-Auxiliary: *M* = 74.29, *SD* = 0.44, Auxiliary-Participle: *M* = 94.37, *SD* = 0.23. Thus, both forms of the two-verb-clusters, Participle-Auxiliary *gedroomd heeft* and Auxiliary-Participle *heeft gedroomd* are accepted by all groups, however, Participle-Auxiliary *gedroomd heeft* is less accepted in both groups of English-speaking learners of Dutch than Auxiliary-Participle *heeft gedroomd*.

As can be seen in **Figure 14**, there is considerable individual variation across all four groups for the grammaticality judgement scores of both Participle-Auxiliary and Auxiliary-Participle, especially in the three groups of learners of Dutch. Participants with positive coefficients rate Participle-Auxiliary and Auxiliary-Participle, respectively, as grammatical more often than the average participant. Participants with negative coefficients rate Participle-Auxiliary and Auxiliary-Participle, respectively, as grammatical less often than the average participant. Thus, while some participants have higher acceptability scores compared to the mean, other participants have lower acceptability scores compared to the mean.

For the grammaticality judgement scores for the two-verb clusters, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). The significant contrast for Group3 indicates that L1 speakers of Dutch overall had higher acceptance rates than learners of Dutch. Post-hoc pairwise comparisons for Group showed that only English-speaking learners of L3 Dutch had a significantly lower acceptance rate that L1 speakers of Dutch (p = .003). Furthermore, there was no main effect for Condition. However, there were significant interactions between Group and Condition. We therefore performed post-hoc pairwise comparisons between Conditions for each group: There were no significant differences between Participle-Auxiliary and Auxiliary-Participle for any group. However, there were marginal differences between Participle-Auxiliary and Auxiliary-Participle for English-speaking learners of L2 Dutch (p = .054) and for L1 speakers of Dutch (p = .094).

To investigate whether LexTALE scores for Dutch and the L2 (English/German) were a significant predictor, we ran the same model with only the three groups of learners of Dutch, including the LexTALE scores as covariates. LexTALE scores for Dutch significantly improved the model (ANOVA, χ^2 = 9.9,

p = .007): Higher LexTALE scores were associated with higher grammaticality judgement scores (*OR* = 1.07, 95% CI [1.02, 1.12]), but the other predictors (Group, Condition and the interaction between Group and Condition) were not significant anymore. Since the odds ratio was close to 1, the effect of LexTALE scores for Dutch is relatively small. Because the LexTALE scores for Dutch for both groups of learners of Dutch with L1 English are significantly lower than for learners of Dutch with L1 German, we checked whether this introduced multicollinearity in the model by computing the variance inflation factor (VIF) for all predictors in the model. The VIF was always well below 2, so this did not seem to be the case. LexTALE scores for the L2 (English/German) did not significantly improve the model.

5.3.5 Grammaticality Judgement Scores: Summary

In summary, both forms of superlatives and two-verb clusters were generally accepted across all groups, with minor variations in grammaticality judgement scores between the two properties. Grammaticality judgement scores for the morphological and syntactic superlative showed high acceptance across all groups, with both forms (*natuurlijkste* & *meest natuurlijke*) universally accepted. Similarly, Participle-Auxiliary and Auxiliary-Participle two-verb clusters were accepted by all groups, although the acceptance of Participle-Auxiliary (*gedroomd heeft*) was slightly lower than Auxiliary-Participle (*heeft gedroomd*) among both groups of English-speaking learners of Dutch, though this difference was not statistically significant. LexTALE scores for Dutch significantly predicted acceptance rates for two-verb clusters across all groups of learners of Dutch, suggesting that higher proficiency in Dutch correlated with higher acceptance of both forms, though the effect was relatively small. LexTale scores for the L2 (English/German) did not predict acceptance rates.

5.3.6 Grammaticality Judgement Reaction Times: Superlatives

It is customary to analyse the RTs for speeded grammaticality judgement for the correct and incorrect answers separately. Since there were high degrees of acceptance of all conditions across all groups, the data were rather unbalanced with relatively few datapoints for incorrect answers. We therefore only analysed the RTs

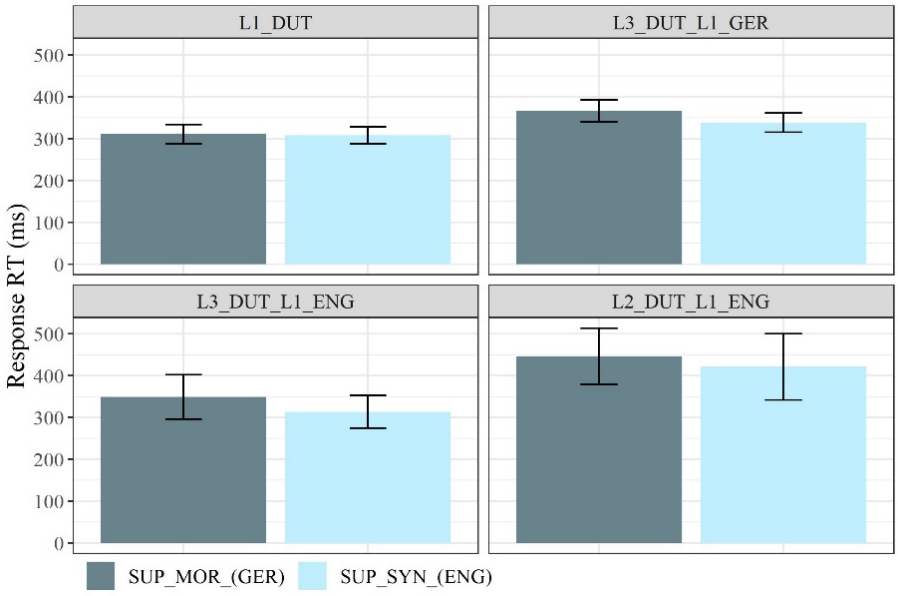
to the correctly answered trials. **Table 15** shows the percentages of correct answers, incorrect answers and NAs for the superlative conditions.

Table 15: *Superlatives: Percentages of Correct Answers, Incorrect Answers and NAs in the Grammaticality Judgement Task*

Group	Condition	Correct (%)	Incorrect (%)	NA (%)
L1_Dutch	Morphological superlative	96.10	3.55	0.35
	Syntactic superlative	96.45	3.55	0.00
L3_DUT_L1_GER	Morphological superlative	93.06	6.02	0.93
	Syntactic superlative	95.37	4.17	0.46
L3_DUT_L1_ENG	Morphological superlative	92.22	7.78	0.00
	Syntactic superlative	91.11	8.89	0.00
L2_DUT_L1_ENG	Morphological superlative	93.06	6.94	0.00
	Syntactic superlative	86.11	11.11	2.78

The results of the grammaticality judgement RTs for the superlatives are shown in **Figure 15** and the results of the final model with the results of the statistical analysis are given in **Table 16**.

Figure 15: *Superlatives: Grammaticality Judgement RT Means and 95% Confidence Intervals*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives.

Table 16: *Superlatives: Model Summary for Grammaticality Judgement RTs*

Model: (ResponseRT ^ -0.30 - 1) / -0.30 ~ SeqTrial.c + Group * Condition + (1 | Subject) + (1 + Condition1 || Itemset)			
Model component	Estimate	Standard error	t-value
Intercept	2.71	0.01	461.32 ***
SeqTrial.c	-0.00	0.00	-4.57 ***
Group1	-0.02	0.01	-2.36 *
Group2	0.00	0.00	-0.01
Group3	-0.01	0.00	-2.53 *
Condition1	-0.00	0.00	-1.70
Group1:Condition1	-0.00	0.00	-0.09
Group2:Condition1	-0.00	0.00	-0.33
Group3:Condition1	0.00	0.00	1.11

As can be seen in **Figure 15**, there are only small differences between the morphological superlative and the syntactic superlative in all four groups: L1 speakers of Dutch: morphological superlative: *M* = 310.65, *SD* = 192.04, syntactic superlative: *M* = 307.94, *SD* = 172.89; German-speaking learners of L3 Dutch: morphological superlative: *M* = 366.20, *SD* = 193.78, syntactic superlative: *M* = 337.82, *SD* = 167.38; English-speaking learners of L3 Dutch: morphological superlative: *M* = 348.63, *SD* = 243.24, syntactic superlative: *M* = 313.84, *SD* = 178.65; English-speaking learners of L2 Dutch: morphological superlative: *M* = 446.16, *SD* = 276.25, syntactic superlative: *M* = 421.29, *SD* = 311.03. While English-speaking learners of L2 Dutch overall have slower RTs, L1 speakers of Dutch overall have faster RTs. Both groups of learners of L3 Dutch fall in between, with English-speaking learners of L3 Dutch having slightly faster RTs that German-speaking learners of L3 Dutch. The three groups of learners of Dutch show slower RTs for the morphological form *natuurlijkste* compared to the syntactic form *meest natuurlijke* of the superlative. In L1 speakers of Dutch, there is almost no difference between the morphological and syntactic superlative.

There was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3), and the contrast between English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch (Group1). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. The significant contrast for Group1 indicates that English-speaking learners of L3 Dutch overall were faster than English-speaking learners of L2 Dutch. Post-hoc pairwise comparisons for Group showed that English-speaking learners of L2 Dutch had significantly slower RTs than L1 speakers of Dutch (p = .018), and marginally slower RTs than English-speaking learners of L3 Dutch (p = .091). There was no main effect for Condition and there were no significant interactions between Group and Condition.

5.3.7 Grammaticality Judgement Reaction Times: Two-Verb Clusters

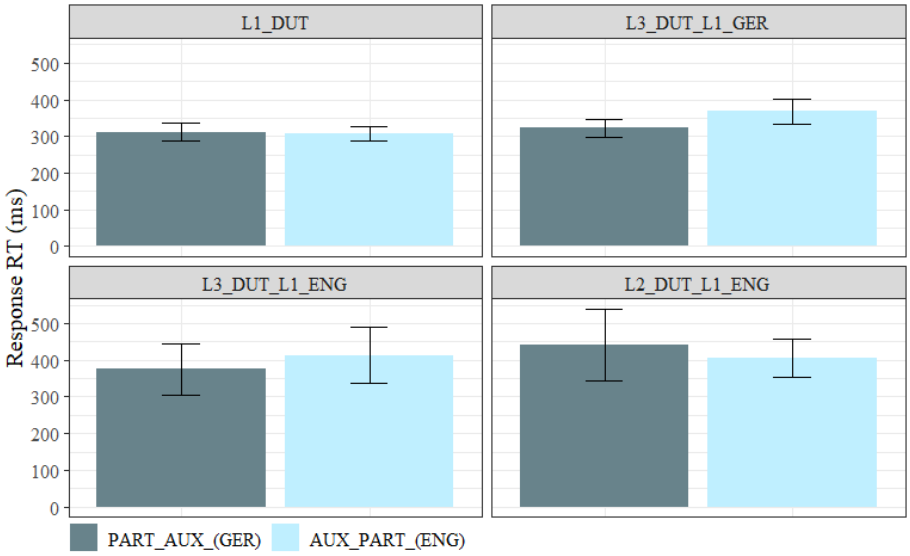
We only analysed the RTs to the correctly answered trials. **Table 17** shows the percentages of correct answers, incorrect answers and NAs for the two-verb cluster conditions.

Table 17: *Two-Verb Clusters: Percentages of Correct Answers, Incorrect Answers and NAs in the Grammaticality Judgement Task*

Group	Condition	Correct (%)	Incorrect (%)	NA (%)
L1_Dutch	Participle-Auxiliary	95.04	4.26	0.71
	Auxiliary-Participle	92.55	7.45	0.00
L3_DUT_L1_GER	Participle-Auxiliary	88.89	11.11	0.00
	Auxiliary-Participle	88.89	10.19	0.93
L3_DUT_L1_ENG	Participle-Auxiliary	71.11	27.78	1.11
	Auxiliary-Participle	86.67	13.33	0.00
L2_DUT_L1_ENG	Participle-Auxiliary	72.22	25.00	2.78
	Auxiliary-Participle	93.06	5.56	1.39

The results of the grammaticality judgement RTs for the two-verb clusters are shown in **Figure 16**, the by-subject coefficients for the effect of condition are shown in **Figure 17**, and the results of the final model with the results of the statistical analysis are given in **Table 18**.

Figure 16: *Two-Verb Clusters: Grammaticality Judgement RT Means and 95% Confidence Intervals*

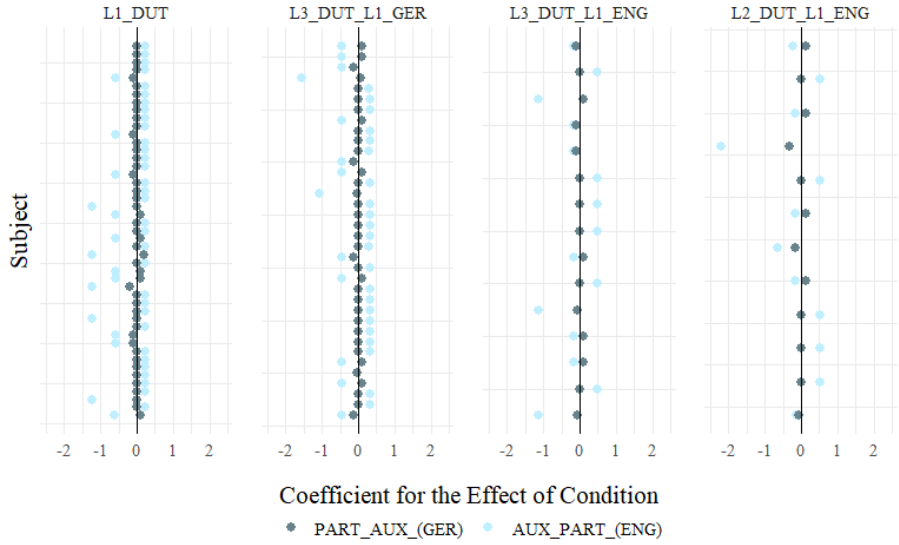


L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

Table 18: Two-Verb Clusters: *Model Summary for Grammaticality Judgement RTs*

Model: (ResponseRT^ -0.26 - 1) / -0.26 ~ SeqTrial.c + Group * Condition + (1 + Condition | Subject)			
Model component	Estimate	Standard error	t-value
Intercept	2.96	0.01	382.07 ***
SeqTrial.c	-0.00	0.00	-5.42 ***
Group1	-0.02	0.01	-1.35
Group2	-0.01	0.01	-0.99
Group3	-0.01	0.00	-2.68 **
Condition1	0.01	0.00	1.95 ·
Group1:Condition1	0.01	0.01	0.87
Group2:Condition1	0.00	0.00	0.77
Group3:Condition1	-0.00	0.00	-1.39

Figure 17: Two-Verb Clusters: *By-Subject Coefficients for the Effect of Condition for Grammaticality Judgement RTs*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

As can be seen in **Figure 16**, there are only small differences between Participle-Auxiliary and Auxiliary-Participle in all four groups: L1 speakers of Dutch: Participle-Auxiliary: *M* = 311.95, *SD* = 205.75, Auxiliary-Participle: *M* = 307.51, *SD* = 170.41; German-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 322.73, *SD* = 165.83, Auxiliary-Participle: *M* = 369.10, *SD* = 240.23; English-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 375.03, *SD* = 276.06, Auxiliary-Participle: *M* = 413.45, *SD* = 342.33; English-speaking learners of L2 Dutch: Participle-Auxiliary: *M* = 442.48, *SD* = 350.16, Auxiliary-Participle: *M* = 405.73, *SD* = 209.30. While both groups of English-speaking learners of Dutch overall have slower RTs, L1 speakers of Dutch overall have faster RTs. German-speaking learners of L3 Dutch fall in between. Within the English-speaking learners of Dutch, English-speaking learners of L2 Dutch show faster RTs for Auxiliary-Participle, and English-speaking learners of L3 Dutch show faster RTs for Participle-Auxiliary. German-speaking learners of L3 Dutch also show faster RTs

for Participle-Auxiliary. Thus, in contrast with English-speaking learners of L2 Dutch, the two groups of learners of L3 Dutch show faster RTs for Participle-Auxiliary *gedroomd heeft* compared to Auxiliary-Participle *heeft gedroomd*. In L1 speakers of Dutch, there is almost no difference between Participle-Auxiliary and Auxiliary-Participle.

As can be seen in **Figure 17**, there is some individual variation in the grammaticality judgement RTs of Auxiliary-Participle across all four groups. Participants with positive coefficients have slower RTs for Auxiliary-Participle than the average participant. Participants with negative coefficients have faster RTs for Auxiliary-Participle than the average participant. Thus, while most participants do not differ much in RTs for Auxiliary-Participle, some participants have faster RTs compared to the mean. For Participle-Auxiliary, there is no variation across the groups.

There was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3), and a marginal effect for Condition. The significant contrast for Group3 indicates that L1 speakers overall were significantly faster than learners of Dutch. Post-hoc pairwise comparison for Group showed that only English-speaking learners of L2 Dutch had significantly slower RTs than L1 speakers of Dutch (p = .036). Post-hoc pairwise comparison for Condition showed overall faster RTs for Participle-Auxiliary than for Auxiliary-Participle, however, this was not significant (p = .055). There were no significant interactions between group and Condition.

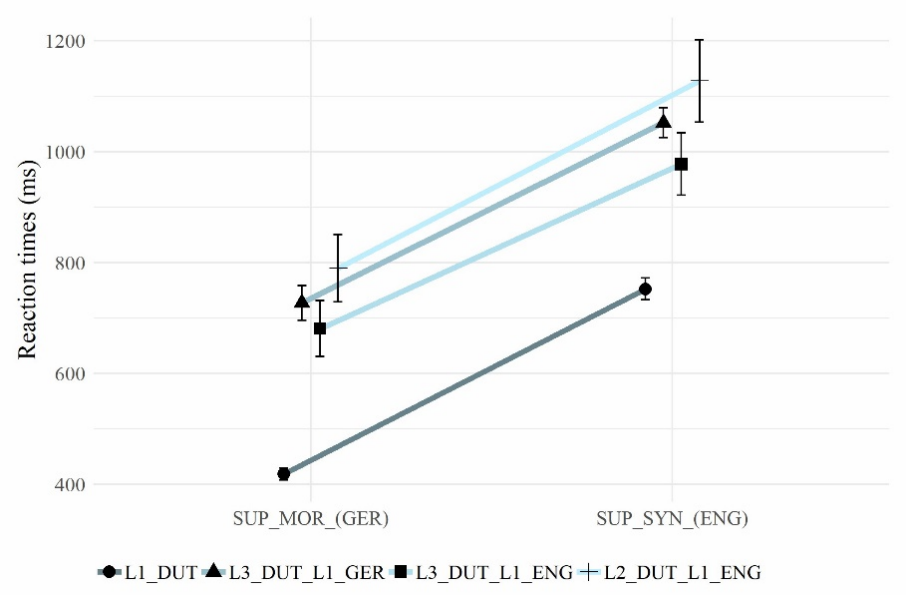
5.3.8 Grammaticality Judgement Reaction Times: Summary

In summary, only small differences in RTs were observed between both forms of superlatives and two-verb clusters across all groups. RTs for the syntactic superlative (*meest natuurlijke*) were slightly faster than for the morphological superlative (*natuurlijkste*) in all groups of learners of Dutch and also the L1 speakers of Dutch, although this difference was not statistically significant. RTs for Participle-Auxiliary (*gedroomd heeft*) were faster than for Auxiliary-Participle (*heeft gedroomd*) in both groups of learners of L3 Dutch, with no significant statistical difference observed. LexTALE scores for Dutch and the L2 (English/German) did not predict RTs.

5.3.9 Self-Paced Reading: Superlatives

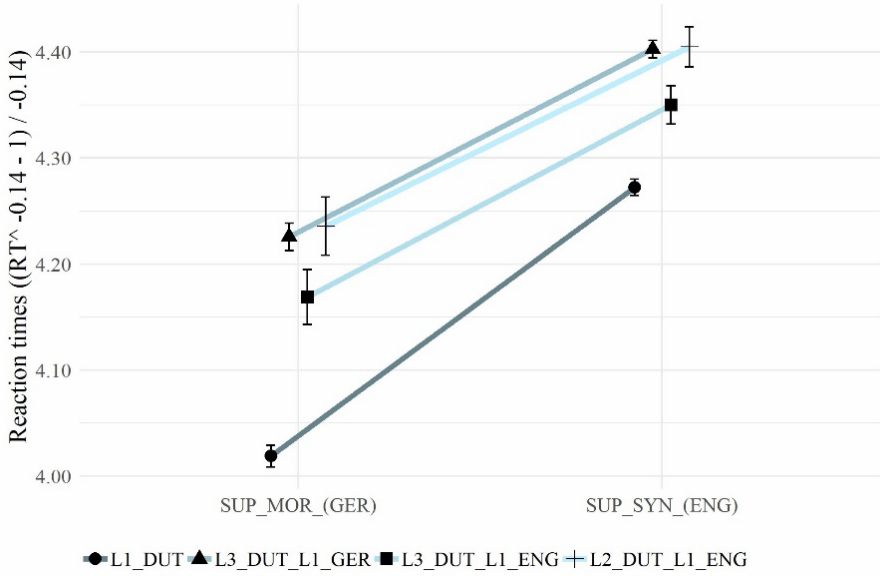
The results of the self-paced reading task for the superlatives are shown in **Figure 18** (critical region, raw RTs), **Figure 19** (critical region, transformed RTs), **Figure 20** (spillover region, transformed RTs), **Figure 21** (post-spillover region, transformed RTs) and **Figure 22** (post-spillover region II, transformed RTs), and the results of the final models with the results of the statistical analyses are given in **Table 19** (critical region, transformed RTs), **Table 20** (spillover region, transformed RTs), **Table 21** (post-spillover region, transformed RTs) and **Table 22** (post-spillover region II, transformed RTs).

Figure 18: *Superlatives: Critical Region (Raw RTs and 95% Confidence Intervals)*



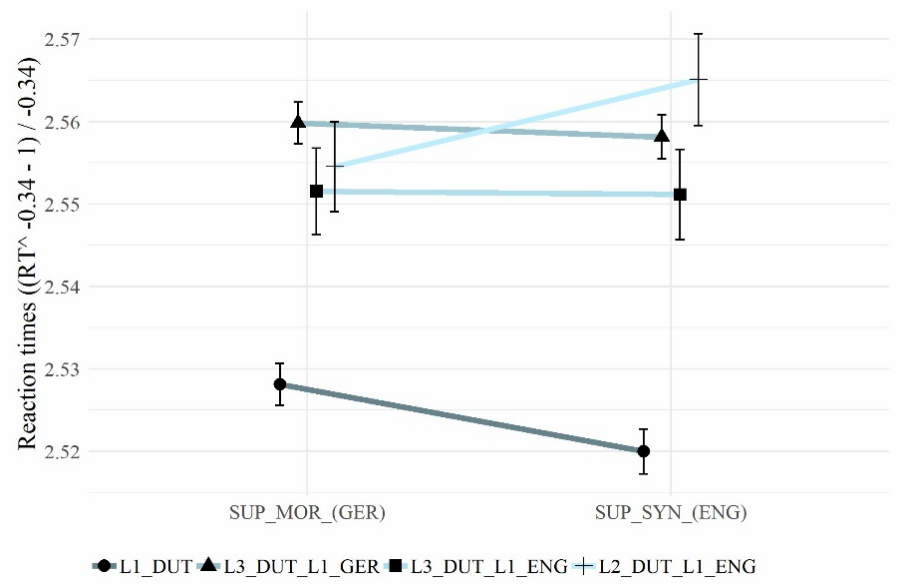
L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives.

Figure 19: *Superlatives: Critical Region (Transformed RTs and 95% Confidence Intervals)*



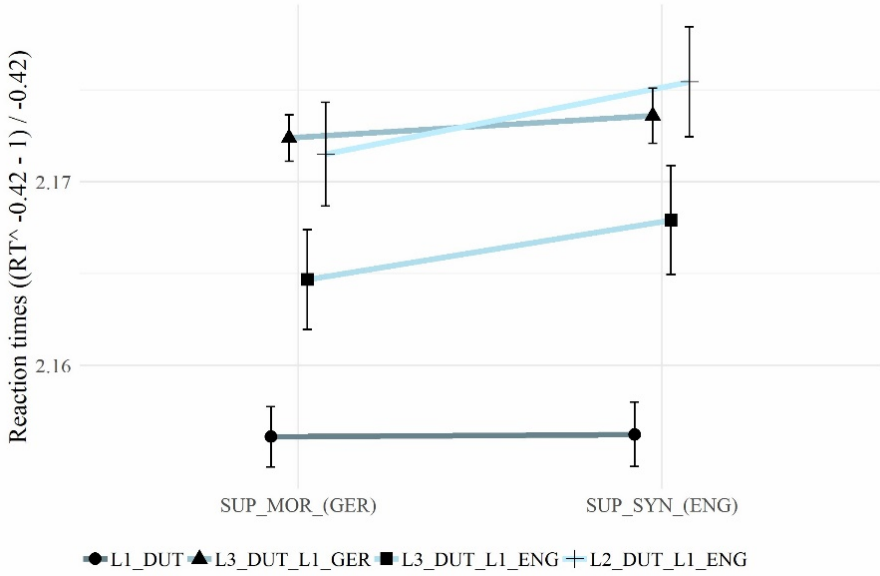
L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.14) determined by Box-Cox-Procedure).

Figure 20: *Superlatives: Spillover Region ('apple', Transformed RTs and 95% Confidence Intervals)*



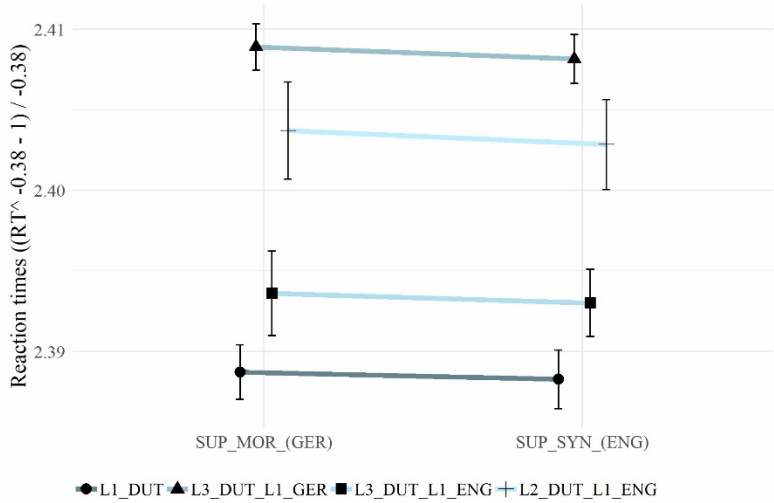
L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.34) determined by Box-Cox-Procedure).

Figure 21: *Superlatives: Post-Spillover Region ('van', Transformed RTs and 95% Confidence Intervals)*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.42) determined by Box-Cox-Procedure).

Figure 22: *Superlatives: Post-Spillover Region II (‘alle appels’, Transformed RTs and 95% Confidence Intervals)*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.38) determined by Box-Cox-Procedure).

Table 19: *Superlatives: Model Summary for Self-Paced Reading RTs (Critical Region)*

Model: (RT_SUP ^ (-0.14) - 1) / (-0.14) ~ SeqTrial.c + Word_Length + Group * Condition + (1 + Condition | Subject)			
Model component	Estimate	Standard error	t-value
Intercept	4.2070	0.0451	93.34 ***
SeqTrial.c	-0.0014	0.0001	-11.67 ***
Word_Length	0.0038	0.0030	1.24
Group1	-0.0302	0.0241	-1.25
Group2	0.0081	0.0106	0.76
Group3	-0.0381	0.0063	-6.03 ***
Condition1	0.0919	0.0063	14.68 ***
Group1:Condition1	0.0032	0.0078	0.41
Group2:Condition1	0.0004	0.0034	0.12
Group3:Condition1	0.0097	0.0020	4.79 ***

As shown in **Figure 18**, there are clear differences in raw RTs between the morphological superlative and the syntactic superlative in all four groups: L1 speakers of Dutch: morphological superlative: *M* = 418.67, *SD* = 182.23, syntactic superlative: *M* = 752.26, *SD* = 340.39; German-speaking learners of L3 Dutch: morphological superlative: *M* = 727.09, *SD* = 470.36, syntactic superlative: *M* = 1052.00, *SD* = 401.78; English-speaking learners of L3 Dutch: morphological superlative: *M* = 680.67, *SD* = 489.59, syntactic superlative: *M* = 977.64, *SD* = 544.53; English-speaking learners of L2 Dutch: morphological superlative: *M* = 789.73, *SD* = 521.64, syntactic superlative: *M* = 1127.24, *SD* = 645.40. While English-speaking learners of L2 Dutch overall have slower RTs, L1 speakers of Dutch overall have faster RTs. German-speaking and English-speaking learners of L3 Dutch fall in between. All four groups show faster RTs for the morphological form *natuurlijkste* compared to the syntactic form *meest natuurlijke* of the superlative.

As can be seen in **Figure 19**, the transformation of the superlative RTs for the critical region did not seem to affect the effects of Group and Condition or the interaction between Group and Condition much. For the critical region of the superlatives, there was a main effect for Condition, and there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). Post-hoc pairwise comparisons for Condition showed overall significantly slower RTs for the syntactic superlative compared to the morphological superlative (*p* = <.001). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. Post-hoc pairwise comparisons for Group showed that all groups of learners of Dutch had significantly slower RTs than L1 speakers of Dutch (German-speaking learners of L3 Dutch and English-speaking learners of L2 Dutch vs. L1 speakers of Dutch (*p* = <.001), English-speaking learners of L3 Dutch vs. L1 speakers of Dutch (*p* = .014)). Furthermore, there were significant interactions between Group and Condition. We therefore performed post-hoc pairwise comparisons between Conditions for each group. All groups had significantly slower RTs for the syntactic superlative compared to morphological superlative (*p* = <.001).

Table 20: *Superlatives: Model Summary for Self-Paced Reading RTs (Spillover Region)*

Model: (RT_SUP_Spill ^ (-0.34) - 1) / (-0.34) ~ SeqTrial.c + Group * Condition + (1|Subject) + (1|Itemset)			
Model component	Estimate	Standard error	t-value
Intercept	2.5490	0.0032	790.28 ***
SeqTrial.c	-0.0004	0.0000	-11.46 ***
Group1	-0.0042	0.0056	-0.75
Group2	0.0011	0.0025	0.46
Group3	-0.0082	0.0015	-5.59 ***
Condition1	-0.0000	0.0011	-0.02
Group1:Condition1	-0.0028	0.0019	-1.47
Group2:Condition1	-0.0011	0.0008	-1.35
Group3:Condition1	-0.0014	0.0005	-2.76 **

For the spillover region of the superlatives (**Figure 20**), there was no main effect for Condition. However, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. Post-hoc pairwise comparisons for Group showed that all groups of learners of Dutch had significantly slower RTs than native speakers of Dutch (German-speaking learners of L3 Dutch vs. L1 speakers of Dutch (p = <.001), English-speaking learners of L3 Dutch vs. L1 speakers of Dutch (p = .010), German-speaking learners of L2 Dutch vs. L1 speakers of Dutch (p = .001)). Furthermore, there were significant interactions between Group and Condition. We therefore performed post-hoc pairwise comparisons between Conditions for each group. L1 speakers of Dutch had significantly faster RTs for the syntactic superlative compared to the morphological superlative (p = .004). Learners of Dutch did not differ between conditions. However, for English-speaking learners of L2 Dutch there was a marginal difference between conditions (p = .064) with faster RTs for the morphological superlative compared to the syntactic superlative.

Table 21: *Superlatives: Model Summary for Self-Paced Reading RTs (Post-Spillover Region)*

Model: (RT_SUP_Post_Spill ^ (-0.42) - 1) / (-0.42) ~ SeqTrial.c + Group * Condition + (1 | Subject) + (1 + Condition1 || Itemset)			
Model component	Estimate	Standard error	t value
Intercept	2.1670	0.0020	1072.47 ***
SeqTrial.c	-0.0002	0.0000	-10.45 ***
Group1	-0.0035	0.0035	-1.03
Group2	0.0010	0.0015	0.68
Group3	-0.0037	0.0009	-4.08 ***
Condition1	0.0011	0.0007	1.52
Group1:Condition1	-0.0002	0.0011	-0.19
Group2:Condition1	-0.0004	0.0005	-0.89
Group3:Condition1	-0.0003	0.0003	-1.20

For the post-spillover region of the superlatives (**Figure 21**), there was no main effect for Condition. However, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. Post-hoc pairwise comparisons for Group showed that German-speaking learners of L3 Dutch (p = <.001) and English-speaking learners of L2 Dutch (p = .018) had significantly slower reaction times than L1 speakers of Dutch. However, in contrast to the critical region and the spill-over region, there was no significant difference between English-speaking learners of L3 Dutch and L1 speakers of Dutch. Furthermore, there were no significant interactions between Group and Condition.

Table 22: *Superlatives: Model Summary for Self-Paced Reading RTs (Post-Spillover Region II)*

Model: (RT_SUP_Post_Spill_II ^ (-0.38) - 1) / (-0.38) ~ SeqTrial.c + Group * Condition + (1 + Condition | Subject) + (1 | Itemset)			
Model component	Estimate	Standard error	t-value
Intercept	2.3980	0.0022	1091.88 ***
SeqTrial.c	-0.0003	0.0000	-13.35 ***
Group1	-0.0049	0.0037	-1.32
Group2	0.0034	0.0016	2.07 *
Group3	-0.0033	0.0010	-3.37 ***
Condition1	-0.0003	0.0006	-0.58
Group1:Condition1	0.0000	0.0010	0.04
Group2:Condition1	-0.0000	0.0004	-0.06
Group3:Condition1	0.0000	0.0003	-0.16

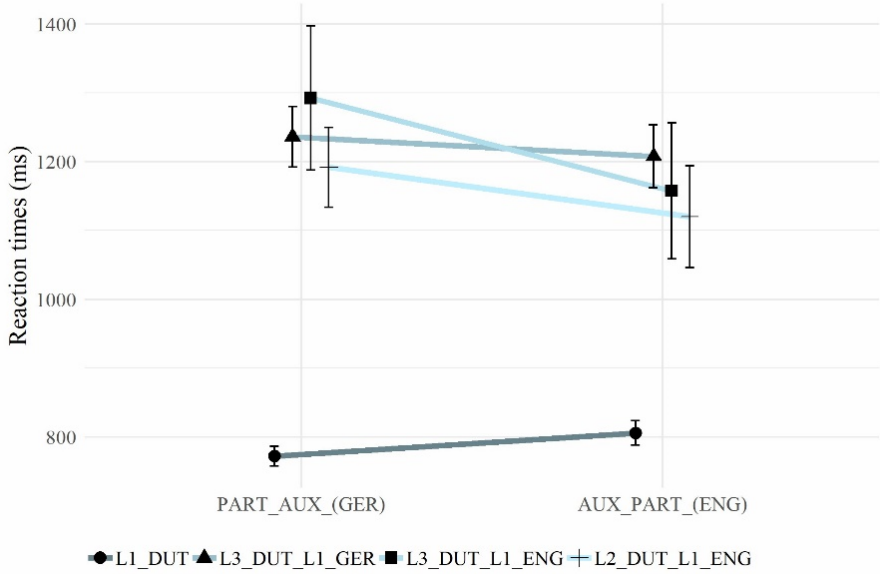
For the post-spillover region II of the superlatives (**Figure 22**), there was no main effect for Condition. However, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3), and the contrast between the English-speaking learners of Dutch (English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch) and the German-speaking learners of L3 Dutch (Group2). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. The significant contrast for Group2 indicates that learners of Dutch with L1 English (English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch) overall were significantly faster than learners of Dutch with L1 German (German-speaking learners of L3 Dutch). Post-hoc pairwise comparisons for Group showed that only German-speaking learners of L3 Dutch (p <.001) had significantly slower RTs than L1 speakers of Dutch. The difference between L1 speakers of Dutch and English-speaking learners of L2 Dutch was only marginally significant (p = .093). Again, the difference between L1 speakers of Dutch and English-speaking learners of L3 Dutch was not significant. There were no significant interactions between Group and Condition.

5.3.10 Self-Paced Reading: Two-Verb Clusters

The results of the self-paced reading task for the two-verb clusters are shown in **Figure 23** (critical region, raw RTs), **Figure 24** (critical region, transformed RTs),

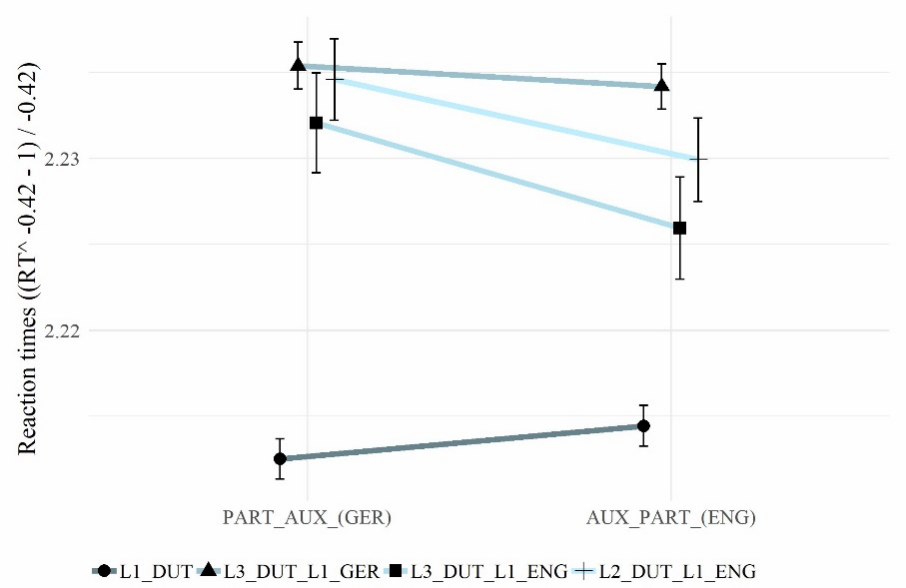
Figure 25 (spillover region, transformed RTs) and **Figure 26** (post-spillover region, transformed RTs), and the by-subject coefficients for the effect of condition of the critical region are shown in **Figure 27**. The results of the final models with the results of the statistical analyses are given in **Table 23** (critical region, transformed RTs), **Table 24** (spillover region, transformed RTs) and **Table 25** (post-spillover region, transformed RTs).

Figure 23: *Two-Verb Clusters: Critical Region (Raw RTs and 95% Confidence Intervals)*



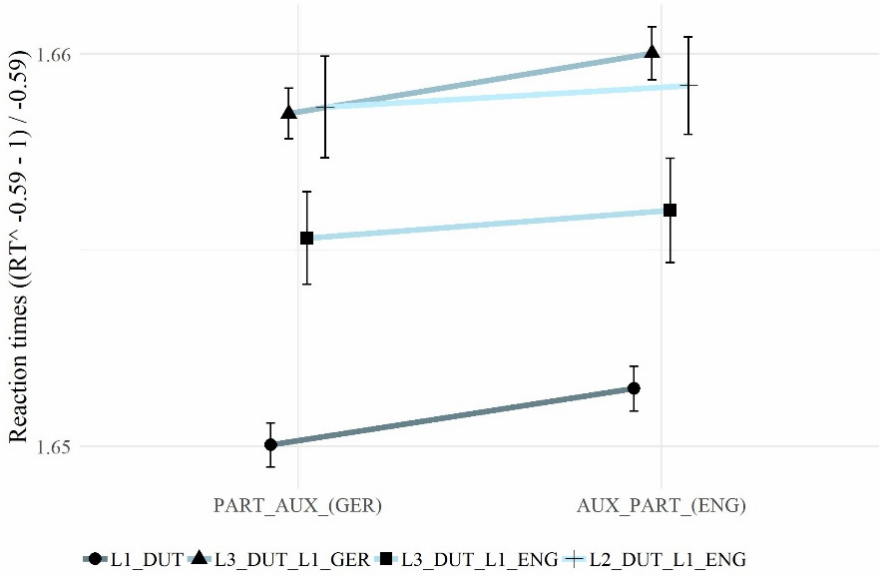
L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

Figure 24: *Two-Verb Clusters: Critical Region (Transformed RTs and 95% Confidence Intervals)*



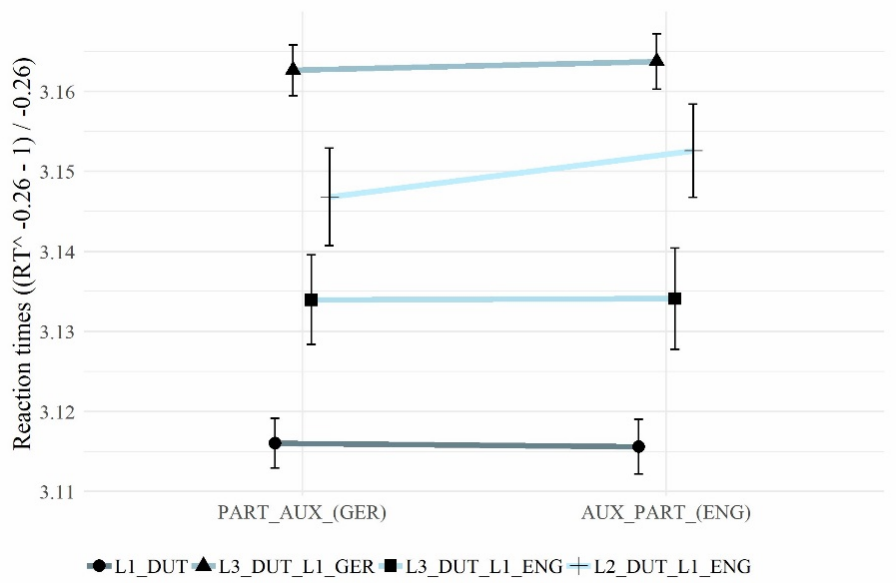
L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.42) determined by Box-Cox-Procedure).

Figure 25: *Two-Verb Clusters: Spillover Region ('en', Transformed. RTs and 95% Confidence Intervals*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.59) determined by Box-Cox-Procedure).

Figure 26: *Two-Verb Clusters: Post-Spillover Region ('de professor', Transformed RTs and 95% Confidence Intervals)*

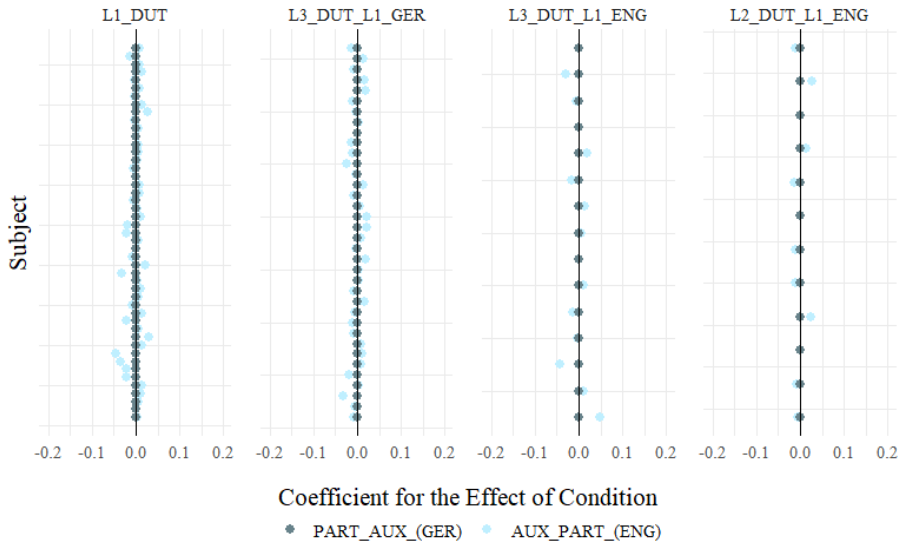


L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters. Reaction times = transformed RTs (RTs transformed using exact lambda value (-0.26) determined by Box-Cox-Procedure).

Table 23: *Two-Verb Clusters: Model Summary for Self-Paced Reading RTs (Critical Region)*

Model: (RT_VC ^ (-0.42) - 1) / (-0.42) ~ SeqTrial.c + Group * Condition + (1 + Condition | Subject) + (1 + Condition1 || Itemset)			
Component	Estimate	Standard error	t-value
Intercept	2.2270	0.0019	-1173.76 ***
SeqTrial.c	-0.0002	0.0000	-9.86 ***
Group1	-0.0014	0.0032	-0.44
Group2	0.0013	0.0014	0.96
Group3	-0.0047	0.0008	-5.60 ***
Condition1	-0.0013	0.0005	-2.85 *
Group1:Condition1	-0.0005	0.0008	-0.59
Group2:Condition1	0.0008	0.0004	2.15 *
Group3:Condition1	0.0008	0.0002	3.72 ***

Figure 27: *Two-Verb Clusters: By-Subject Coefficients for the Effect of Condition for Self-Paced Reading RTs (Critical Region)*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

As shown in **Figure 23**, there are small differences in raw RTs between Participle-Auxiliary and Auxiliary-Participle in all four groups: L1 speakers of Dutch: Participle-Auxiliary: *M* = 771.96, *SD* = 243.98, Auxiliary-Participle: *M* = 805.67, *SD* = 300.44; German-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 1236.31, *SD* = 658.24, Auxiliary-Participle: *M* = 1207.85, *SD* = 687.37; English-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 1292.73, *SD* = 1005.62, Auxiliary-Participle: *M* = 1157.57, *SD* = 959.37; English-speaking learners of L2 Dutch: Participle-Auxiliary: *M* = 1191.82, *SD* = 501.10, Auxiliary-Participle: *M* = 1120.18, *SD* = 639.35. All groups of learners of Dutch have generally slower RTs than L1 speakers of Dutch. While L1 speakers of Dutch show slightly faster RTs for Participle-Auxiliary *gedroomd heft* compared to Auxiliary-Participle *heeft gedroomd*, all groups of learners of Dutch show faster RTs for Auxiliary-Participle *heeft gedroomd* compared to Participle-Auxiliary *gedroomd heeft*. The difference between Auxiliary-Participle and Participle-Auxiliary is more pronounced in both groups of English-speaking learners of Dutch than in German-speaking learners of L3 Dutch.

As can be seen in **Figure 27**, there is not much individual variation in the self-paced reading RTs of the critical region across all four groups. Only L1 speakers of Dutch show some individual variation regarding Auxiliary-Participle. Participants with positive coefficients have slower RTs for Auxiliary-Participle than the average participant. Participants with negative coefficients have faster RTs for Auxiliary-Participle than the average participant. Thus, while most participants do not differ much in RTs for Auxiliary-Participle, some participants have faster RTs compared to the mean. For Participle-Auxiliary, there is no variation across the groups.

As can be seen in **Figure 24**, the transformation of the two-verb cluster RTs for the critical region did not seem to affect the effects of Group and Condition or the interaction between Group and Condition much. It mainly seems to affect the relative ordering of the groups in terms of overall reading speed: The transformed RTs show comparatively slower RTs for English-speaking learners of L2 Dutch and German-speaking learners of L3 Dutch in comparison to the raw RTs. The observed change in group order between raw RTs and transformed RTs suggests that the transformation has a varied impact on RTs for each language group. Transformations tend to disproportionately affect larger values, potentially compressing the scale differently across groups. English-speaking learners of L2 Dutch and German-speaking learners of L3 Dutch show a more substantial

transformation effect, possibly due to greater variability or more extreme values in their raw RTs.

For the critical region of the two-verb clusters, there was a main effect for Condition, and there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3). Post-hoc pairwise comparisons for Condition showed overall significantly faster RTs for Auxiliary-Participle than for Participle-Auxiliary (p = .011). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. Post-hoc pairwise comparisons for Group showed that all groups of learners of Dutch had significantly slower RTs than L1 speakers of Dutch (German-speaking learners of L3 Dutch vs. L1 speakers of Dutch (p = <.001), English-speaking learners of L3 Dutch vs. L1 speakers of Dutch (p = .008), English-speaking learners of L2 Dutch vs. L1 speakers of Dutch (p = .004)). Furthermore, there were significant interactions between Group and Condition. We therefore performed post-hoc pairwise comparisons between Conditions for each group. English-speaking learners of L3 Dutch had significantly slower RTs for Participle-Auxiliary compared to Auxiliary-Participle (p = .003), the same holds true for English-speaking learners of L2 Dutch (p = .048). However, the RTs for German-speaking learners of L3 Dutch and L1 speakers of Dutch did not differ significantly between conditions.

Table 24: *Two-Verb Clusters: Model Summary for Self-Paced Reading RTs (Spillover Region)*

Model: (RT_VC_Spill ^ (-0.59) - 1) / (-0.59) ~ SeqTrial.c + Group * Condition + (1 + Condition | Subject) + (1 | Itemset)			
Component	Estimate	Standard error	t-value
Intercept	1.6560	0.0007	2264.66 ***
SeqTrial.c	-0.0001	0.0000	-8.44 ***
Group1	-0.0016	0.0012	-1.31
Group2	0.0007	0.0005	1.21
Group3	-0.0018	0.0003	-5.56 ***
Condition1	0.0005	0.0003	1.86 ·
Group1:Condition1	0.0001	0.0005	0.13
Group2:Condition1	0.0002	0.0002	0.69
Group3:Condition1	0.0001	0.0001	0.49

For the spillover region of the two-verb clusters (**Figure 25**), there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3), and a marginal effect for Condition. Post-hoc pairwise comparison for Condition showed overall faster RTs for Participle-Auxiliary than for Auxiliary-Participle, however, the difference was not significant (p = .065). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. Post-hoc pairwise comparisons for Group showed that German-speaking learners of L3 Dutch (p = <.001) and English-speaking learners of L2 Dutch (p = <.001) had significantly slower RTs than L1 speakers of Dutch. The difference between L1 speakers of Dutch and English-speaking learners of L3 Dutch was only marginally significant (p = .052). There were no significant interactions between group and Condition.

Table 25: *Two-Verb Clusters: Model Summary for Self-Paced Reading RTs (Post-Spillover Region)*

Model: (RT_VC_Post_Spill ^ (-0.26) - 1) / (-0.26) ~ SeqTrial.c + Group * Condition + (1 | Subject) + (1 + Condition1 || Itemset)			
Component	Estimate	Standard error	t-value
Intercept	3.1410	0.0041	758.03 ***
SeqTrial.c	-0.0004	0.0000	-8.38 ***
Group1	-0.0076	0.0071	-1.07
Group2	0.0073	0.0031	2.24 *
Group3	-0.0083	0.0019	-4.46 ***
Condition1	0.0009	0.0013	0.71
Group1:Condition1	-0.0012	0.0022	-0.52
Group2:Condition1	-0.0003	0.0010	-0.31
Group3:Condition1	-0.0004	0.0006	-0.68

For the post-spillover region of the two-verb clusters (**Figure 26**), there was no main effect for Condition. However, there was a main effect for Group, the contrast between learners of Dutch and L1 speakers of Dutch (Group3), and the contrast between English-speaking learners of Dutch (English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch) and the German-speaking learners of L3 Dutch (Group2). The significant contrast for Group3 indicates that L1 speakers of Dutch overall were significantly faster than learners of Dutch. The significant contrast for Group2 indicates that learners of Dutch with L1 English (English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch)

overall were significantly faster than learners of Dutch with L1 German (German-speaking learners of L3 Dutch). Post-hoc pairwise comparisons for Group showed that only German-speaking learners of L3 Dutch (p <.001) and English-speaking learners of L2 Dutch (p .027) had significantly slower RTs than L1 speakers of Dutch. The difference between L1 speakers of Dutch and English-speaking learners of L3 Dutch was not significant here as opposed to the critical region (significant) and the spillover region (marginally significant). There were no significant interactions between group and Condition.

5.3.11 Self-Paced Reading: Summary

For the superlatives, we observe the following pattern: In the critical region, syntactic superlatives (meest natuurlijke) consistently elicited slower RTs compared to morphological superlatives (natuurlijkste) across all groups. Moving to the spillover region, while L1 speakers of Dutch showed significantly faster RTs for syntactic superlatives compared to morphological superlatives, the three groups of learners of Dutch showed no significant differences between syntactic and morphological superlatives. In both the post-spillover region and post-spillover region II, there were no differences in RTs between syntactic and morphological superlatives across the groups. For the two-verb clusters, we observe the following pattern: In the critical region, Participle-Auxiliary (gedroomd heeft) elicited slower RTs compared to Auxiliary-Participle (heeft gedroomd) in English-speaking learners of Dutch, however, in German-speaking learners of L3 Dutch and L1 speakers of Dutch there was no significant difference between conditions. In both the spillover region and the post-spillover region there were no differences in RTs between Participle-Auxiliary and Auxiliary-Participle across groups. To sum up, while the three groups of learners of Dutch do not differ significantly regarding RTs of the superlatives, they do differ with regard to the RTs of the two-verb clusters. In the critical region, both groups of English-speaking learners of Dutch show faster RTs for Auxiliary-Participle, reflecting the form available in their L1 English. In contrast, German-speaking learners of L3 Dutch show faster RTs for Participle-Auxiliary, reflecting the form available in their L1 German.

5.4 Discussion

The aim of this study was to investigate which model of L3 morphosyntactic transfer, the Typological Primacy Model or the L2 Status Factor Hypothesis, best predicts morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 processing and comprehension. If the Typological Primacy Model best predicts morphosyntactic transfer in L3 acquisition, we should find different transfer patterns in German-speaking and English-speaking learners of L3 Dutch, namely L1 transfer in German-speaking learners of L3 Dutch, and L2 transfer in English-speaking learners of L3 Dutch. However, if the L2 Status Factor Hypothesis best predicts morphosyntactic transfer in L3 acquisition, we should find similar transfer patterns in German-speaking and English-speaking learners of L3 Dutch, namely L2 transfer in both groups of learners of L3 Dutch. In line with the literature, we formulated the following hypotheses:

(**H.1**) If the **Typological Primacy Model** best predicts morphosyntactic transfer into the L3, both groups of learners of L3 Dutch will transfer from German, and have faster RTs and higher accuracy rates for the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

(**H.2**) If the **L2 Status Factor Hypothesis** best predicts morphosyntactic transfer into the L3, learners of L3 Dutch with L1 German will transfer from L2 English, and have faster RTs and higher accuracy rates for the syntactic superlative (*de meest natuurlijke appel*) and Auxiliary-Participle clusters (*heeft gedroomd*). Learners of L3 Dutch with L1 English will transfer from L2 German, and have faster RTs and higher accuracy rates for the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

Furthermore, we investigated whether we can replicate the results in different linguistic properties (superlatives and two-verb clusters) (SQ.2), and to what extent morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2 (SQ.4). We will first discuss the results regarding the superlatives, then discuss the results regarding the two-verb clusters, and finally discuss the overall results by comparing the results of the two linguistic properties.

5.4.1 Superlatives

In accordance with the literature, we would expect that L1 speakers of Dutch will have similar accuracy rates and RTs for both the morphological superlative (*natuurlijkste*) and the syntactic superlative (*meest natuurlijke*), as both forms are available in Dutch. However, if a difference between conditions is observed, we argue that the syntactic superlative will have faster RTs compared to the morphological superlative in the self-paced reading task, which can be attributed to *most-support* (Mondorf, 2009; Cheung & Zhang, 2016; see **3.1 Superlatives**). This is what we find in our data. Regarding the grammaticality judgement scores and the grammaticality judgement RTs, there is no significant difference between the two conditions. L1 speakers of Dutch judge the morphological superlative and the syntactic superlative grammatical to the same extent and at the same speed. Additionally, there was some individual variation in accepting the morphological superlative among L1 speakers of Dutch, but not in accepting the syntactic superlative. Although the morphological superlative generally has high acceptance rates, some participants had lower acceptability scores than the average participant. This suggests that individual differences, such as language experience or personal preference, might influence the acceptability of this form.

Regarding the self-paced reading RTs, there is a significant difference between the morphological superlative and the syntactic superlative in the critical region. L1 speakers of Dutch have faster RTs for the morphological superlative than for the syntactical superlative. However, this might be the result of an experimental artefact, as the morphological superlative is shorter in terms of word length than the syntactic superlative, although, the covariate Word_Length was not a significant predictor in the final model for the critical region (see **5.2.5 Analysis: Self-Paced Reading**). It seems, however, that the spillover region, which is the same for both conditions (*appel*), reflects a processing difference between conditions. In the spillover region, L1 speakers of Dutch have faster RTs for the syntactic superlative than for the morphological superlative. In line with Mondorf (2009) and Cheung and Zhang (2016), these results suggest that the syntactic superlative reduces the cognitive effort needed during language processing, supporting the idea of *most-support*. In the two regions following the spillover region (post-spillover region and post-spillover region II), there are no significant differences between the two conditions.

In German-speaking and English-speaking learners of L3 Dutch, our results present a more complex pattern. Regarding the grammaticality judgement scores and the grammaticality judgement RTs, there is no significant difference between conditions. Both groups of learners of L3 Dutch, like L1 speakers of Dutch, judge the morphological superlative and the syntactic superlative as equally grammatical and at the same speed. This lack of significant difference could first of all indicate no specific evidence for any form of morphosyntactic transfer in our data. For example, both groups of learners of L3 Dutch might have learned that the trisyllabic and polysyllabic adjectives used in our study can be formed both morphologically and syntactically in Dutch. This is also reflected in the relatively low percentages of incorrect answers to the grammaticality judgement task (see **Table 15**). Alternatively, it might suggest that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, indicating that neither is blocked. Consequently, this provides no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis, which both argue that only one language is selected during morphosyntactic transfer into the L3. According to the Typological Primacy Model, only German, the language typologically closer to Dutch is selected as the source of morphosyntactic transfer into L3 Dutch in both groups of learners of L3 Dutch, and according to the L2 Status Factor Hypothesis, on the other hand, only the L2, that is, English for the German-speaking learners of L3 Dutch and German for the English-speaking learners of L3 Dutch, is selected as the source of morphosyntactic transfer into the L3. This is not what we find in our data. Moreover, like in L1 speakers of Dutch, there was some individual variation in accepting the morphological superlative among the two groups of learners of L3 Dutch, but not in the syntactic superlative. Although the morphological superlative generally has high acceptance rates, some participants had lower acceptability scores than the average participant. This suggests that in these participants the syntactic superlative, that is, the English form, is favoured over the morphological superlative, that is the German form. This individual variation suggests that the overall results are not due to morphosyntactic transfer from one language or another, but to factors within the participants (e.g., proficiency**,** language instruction, language activation and use, etc.), indicating that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, and providing no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis.

Regarding the self-paced reading RTs, there is a significant difference between the morphological superlative and the syntactic superlative in the critical region. Both groups of learners of L3 Dutch have faster RTs for the morphological superlative, that is, the German form, than for the syntactic superlative, that is, the English form. Since both groups of learners of L3 Dutch seem to select the typologically closer language, German, as the source of morphosyntactic transfer into L3 Dutch, this might indicate support for the Typological Primacy Model and represent evidence against the L2 Status Factor Hypothesis. However, in the three regions following the critical region (spillover region, post-spillover region and post-spillover region II), we observe a different pattern. For the German-speaking and English-speaking learners of L3 Dutch, there are no significant differences between the two conditions. Thus, the advantage of the morphological superlative in the critical region disappears immediately and might be due to factors other than typological proximity, such as an experimental artefact, as seen with L1 speakers of Dutch (see above). If we argue that the results in the critical region are due to an experimental artefact, this also implies that there is no support for the Typological Primacy Model in the critical region. In the spillover region, which is the same for both conditions (*appel*), both groups of learners of L3 Dutch, unlike L1 speakers of Dutch, show no difference between the morphological superlative and the syntactic superlative. Similar to the results of the grammaticality judgement scores and the grammaticality judgement RTs, this could either indicate no specific evidence for any form of morphosyntactic transfer in our data, or availability of both the L1 and L2 in morphosyntactic transfer into L3 Dutch (see above). Furthermore, the results of the spillover region indicate no *most-support* (see above). However, we would expect that if *most-support* is present in L1 speakers of Dutch, it would also be present in learners of Dutch. Thus, we would expect that learners of L3 Dutch generally show faster RTs for the syntactic superlative than for the morphological superlative. This is not what we find in our data. It might be the case that in both groups of learners of L3 Dutch, the typologically closer language, German, is selected as the source of morphosyntactic transfer into the L3 Dutch. This transfer from German might counteract *most-support*, resulting in comparatively faster RTs for the morphological superlative and comparatively slower RTs for the syntactic superlative, compared to L1 speakers of Dutch, leading to no significant difference between conditions. If both German and English were selected for morphosyntactic transfer into L3 Dutch, we would expect to see the same pattern as in L1 speakers of Dutch, as the selection of both languages would lead to similar RTs in the

morphological superlative and the syntactic superlative, however, the additional effect of *most-support* would lead to faster RTs in the syntactic superlative. If only English was selected for morphosyntactic transfer into L3 Dutch, we might expect to see an even more pronounced difference between the morphological superlative and the syntactic superlative than in L1 speakers of Dutch, since the selection of English, together with the additional effect of *most-support*, would lead to faster RTs for the syntactic superlative. However, this is not what we find in our data. Overall, the results of German-speaking and English-speaking learners of L3 Dutch suggest support for the Typological Primacy Model and represent evidence against the L2 Status Factor Hypothesis. The fact that the two groups of learners of L3 Dutch do not differ in their pattern supports the idea that there is no evidence for the L2 Status Factor Hypothesis in our data.

In summary, the results of the grammaticality judgement task do not suggest support for either the Typological Primacy Model or for the L2 Status Factor. The results of the spillover region of the self-paced reading task do not suggest support for the L2 Status Factor Hypothesis but are consistent with the Typological Primacy Model for both groups of learners of L3 Dutch.

5.4.2 Two-Verb Clusters

Based on the literature, we would expect that L1 speakers of Dutch would have similar accuracy rates and RTs for both Participle-Auxiliary (*gedroomd heeft*) and Auxiliary-Participle (*heeft gedroomd*), as both forms are available in Dutch (see **3.2 Two-Verb Clusters**). This is what we find in our data. Regarding the grammaticality judgement scores and the grammaticality judgement RTs, there is no significant difference between conditions. L1 speakers of Dutch judge Participle-Auxiliary and Auxiliary-Participle grammatical to the same extent and at the same speed. Regarding the self-paced reading RTs, again, there is no significant difference between conditions. L1 speakers of Dutch have similar RTs for both Participle-Auxiliary and Auxiliary-Participle. In the three regions following the spillover region, there are no significant differences between the two conditions either. Additionally, while both forms of two-verb clusters generally have high acceptance rates, there was considerable individual variation in accuracy rates for both Participle-Auxiliary and Auxiliary-Participle. There was also some individual variation in the RTs for Auxiliary-Participle among L1 speakers of Dutch. For Participle-Auxiliary, some participants had lower, and some participants

had higher acceptability scores compared to the average participant. For Auxiliary-Participle, some participants had lower acceptability scores, and some had faster RTs than the average participant. This suggests that individual differences, such as language experience or personal preference, might influence the accuracy rates and RTs of these forms in varying ways across different tasks.

As with the superlatives, we see that in German-speaking and English-speaking learners of L3 Dutch, our results present a more complex pattern. Regarding the grammaticality judgement scores and the grammaticality judgement RTs, there is no significant difference between the two conditions. Both groups of learners of L3 Dutch judge Participle-Auxiliary and Auxiliary-Participle grammatical to the same extent and at the same speed. As with the results for the superlatives, this could indicate that there is no specific evidence for any form of morphosyntactic transfer in our data, and that both groups of learners of L3 Dutch might have learned that the two-verb clusters used in our study can be formed both Participle-Auxiliary and Auxiliary-Participle in Dutch. Although, this is not necessarily reflected in the percentages of incorrect answers to the grammaticality judgement task (see **Table 17**). In contrast to German-speaking learners of L3 Dutch (11.11%), English-speaking learners of L3 Dutch (27.78%) had considerably high percentages of non-acceptance rates for Participle-Auxiliary, that is, the German form, compared to Auxiliary-Participle, that is, the English form; and the same holds true for English-speaking learners of L2 Dutch (25.00%). However, the difference between Participle-Auxiliary and Auxiliary-Participle is not significant in either group. Regarding the two groups of English-speaking learners of Dutch, this might be due to the relatively low number of participants. Alternatively, the results of the grammaticality judgement scores and RTs might indicate that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, indicating that neither is blocked. This suggests, as is the case for the superlative results, no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis (see above). Moreover, as with L1 speakers of Dutch, there was considerable individual variation in accepting both Participle-Auxiliary and Auxiliary-Participle among the two groups of learners of L3 Dutch. For both forms of the two-verb clusters, some participants had lower and some participants had higher acceptability scores compared to the average participant, suggesting that both the L1 and the L2 are equally available, and providing no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis (see **5.4.1 Superlatives**).

Regarding the self-paced reading RTs, there is a difference between the two groups of learners of L3 Dutch in the critical region. In German-speaking learners of L3 Dutch, there is no significant difference between Participle-Auxiliary and Auxiliary-Participle. German-speaking learners of L3 Dutch have similar RTs for both conditions, indicating either no specific evidence for any form of morphosyntactic transfer in our data, or availability of both the L1 and L2 in morphosyntactic transfer into L3 Dutch (see above). This would, again, suggest that there is no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis. On the other hand, in English-speaking learners of L3 Dutch, there is a significant difference between Participle-Auxiliary and Auxiliary-Participle. English-speaking learners of L3 Dutch show faster RTs for Auxiliary-Participle, that is, the English form, than for Participle-Auxiliary. Since English is the L1 in English-speaking learners of L3 Dutch and typologically more distant from Dutch than German, this pattern can neither be explained by the Typological Primacy Model nor by the L2 Status Factor Hypothesis. In the three regions following the critical region, there are no significant differences between conditions in the two groups of learners of L3 Dutch. In addition, as with L1 speakers of Dutch, there was some individual variation in the grammaticality judgement RTs for Auxiliary-Participle among the two groups of learners of L3 Dutch. Some participants had faster RTs for Auxiliary-Participle than the average participant, again suggesting availability of both the L1 and the L2 in morphosyntactic transfer into the L3, and providing no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis

In summary, the results of the grammaticality judgement task and the self-paced reading task for the two-verb clusters suggest support for neither the Typological Primacy Model nor the L2 Status Factor Hypothesis.

5.5 Conclusion

The results of our study on the processing and comprehension of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch, do not suggest support for L2 Status Factor Hypothesis. Only the results of the spillover region of the self-paced reading task for the superlatives, are still in line with the Typological Primacy Model in the two groups of learners of L3 Dutch. In the general discussion of this dissertation, we will interpret our findings in the context of alternative models and factors of

morphosyntactic transfer in L3 acquisition (see **Chapter 7. General Discussion and Conclusion**). In this context, we acknowledge that conclusions must be drawn with caution, as our study was explicitly designed to test the Typological Primacy Model against the L2 Status Factor Hypothesis. Additionally, we consider the results of the production of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch (see **Chapter 6. Production**), which provide further insight into the complexities of morphosyntactic transfer into the L3.

CHAPTER 6. PRODUCTION

In the previous chapter, we presented a study on the processing and comprehension of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch. To investigate differences in morphosyntactic transfer into the L3 in both language processing and comprehension, as well as language production, we also employed a production method. In this chapter, we present a study on the production of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch. The study investigates L3 morphosyntactic transfer between the closely related West Germanic languages Dutch, German, and English, specifically testing the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) against the Typological Primacy Model (Rothman, 2011, 2015) (see **2.2 Models of L3 Morphosyntactic Transfer**). The overarching research question of this dissertation is:

(RQ) Which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition?

6.1 Introduction

The Typological Primacy Model (Rothman, 2011, 2015) proposes that either the L1 or the L2, but crucially not both, are available for transfer in L3 acquisition, based on typological proximity determined by the internal linguistic parser, and we can assume that the linguistic parser chooses German as the source of transfer into L3 Dutch (see **2.2.4 Typological Primacy Model**, see also **5.1 Introduction**). In our study on the psychotypological proximity between Dutch, German and English, we find that the typological proximity of both the linguistic parser, and German-speaking and English-speaking learners of L3 Dutch, as well as L1 speakers of Dutch, coincide. All three groups perceive German as closer to Dutch than English is to Dutch (see **Chapter 4. Psychotypology**).

The L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), on the other hand, proposes that the L2 is the only source of morphosyntactic transfer into the L3 (see **2.2.2 L2 Status Factor Hypothesis**, see also **5.1 Introduction**).

Based on the literature and the above-mentioned models on L3 morphosyntactic transfer, we formulate the following hypotheses regarding the production of superlatives and two-verb clusters in Dutch by German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German:

(**H.1**) If the **Typological Primacy Model** best predicts morphosyntactic transfer into the L3, both groups of learners of L3 Dutch will transfer from German, and produce the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

(**H.2**) If the **L2 Status Factor Hypothesis** best predicts morphosyntactic transfer into the L3, learners of L3 Dutch with L1 German will transfer from L2 English, and produce the syntactic superlative (*de meest natuurlijke appel*) and Auxiliary-Participle clusters (*heeft gedroomd*). Learners of L3 Dutch with L1 English will transfer from L2 German, and exclusively produce the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

6.2 Method

In order to answer our research questions, we conducted a sentence completion task also referred to as cloze task or fill-in-the-blank task. For superlative test items, production responses of the morphological superlative (*natuurlijkst*) and the syntactic superlative (*meest natuurlijk*) were collected. With respect to the superlative test items, only the morphological superlative is possible in German; in English, only the syntactic superlative is possible; and in Dutch, both the morphological superlative and the syntactic superlative are possible (**3.1 Superlatives**). For two-verb cluster test items, production responses of Participle-Auxiliary (*gedroomd heeft*) and Auxiliary-Participle (*heeft gedroomd*) were collected. In German, only Participle-Auxiliary is possible; in English, only

Auxiliary-Participle is possible; and in Dutch both Participle-Auxiliary and Auxiliary-Participle are possible (**3.2 Two-Verb Clusters**). The sentence completion task is an offline method. As opposed to online methods, which collect information about sentence interpretation as each segment of the sentence is read in real time, online methods collect information about sentence interpretation after the sentence is read in its entirety (Keating & Jegerski, 2015). Thus, offline methods allow participants to take time to think about the sentence before they decide how to complete it, which allows them to use their metalinguistic knowledge about language and make a conscious decision (Marinis, 2013).

6.2.1 Participants

The same four groups as in the processing and comprehension study took part in the experiment (see **5.2.1 Participants**). However, the composition of the groups differs slightly in terms of the individual participants. All participants reported having normal hearing, normal eyesight and no cognitive impairments. A summary of the demographic details and LexTALE scores for each group is shown in **Table 26**.

Table 26: *Demographic Details and LexTALE Scores for Participants of Production Study*

Group	No.	Age			Gender				LexTALE	
		Mean	SD	Range	Female	Male	Divers	No answer	L2	Dutch
German-speaking learners of L3 Dutch with L2 English	40	24.63	5.91	18-46	31	9	0	0	74.60%	67.43%
English-speaking learners of L3 Dutch with L2 German	17	25.24	10.55	18-59	11	6	0	0	66.80%	63.00%
English-speaking learners of L2 Dutch	15	22.87	11.76	18-65	9	6	0	0	-	60.08%
L1 speakers of Dutch	58	20.07	2.32	18-28	43	14	0	1	-	-

All but five of the German-speaking learners of L3 Dutch with L2 English were students at German universities (University Oldenburg, University Münster, Free University Berlin, University Cologne and University Duisburg-Essen). Three of them reported having more than one L1: German and Turkish, German and

Russian, and German, Russian and Sign Language. All of them learned English as a true L2 and Dutch after English. Students who had another West Germanic L1 in addition to German were not permitted to take part in the study.

All but four of the English-speaking learners of L3 Dutch with L2 German were students at British and American universities, most of them University of Sheffield, but also University of Newcastle upon Tyne, University of California, Berkeley, Stanford University, Columbia University and New York University. Two of them reported having more than one L1: English and Chinese, and English, Konkani and Hindi. Five of them learned German as a true L2, 11 after learning one or more Romance languages, and one after learning Greek. All participants learned Dutch after learning German.

All but two of the English-speaking learners of L2 Dutch were students at British and American universities (see English-speaking learners of L3 Dutch with L2 German above). Two of them learned Dutch as a true L2, 11 after learning one or more Romance languages, one after learning Irish and two Romance languages, and one after learning Hawaiian, Japanese, Esperanto and two Romance languages.

All but six of the L1 speakers of Dutch were students at Dutch universities, most of them University of Groningen. Nine of them reported having more than one L1: Dutch and Frisian[18]. All participants have relatively good knowledge of English (self-assessment: $M = 1.48$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.65$) and all but three also have some knowledge of German (self-assessment: $M = 3.21$ on a scale from 1 (very good) to 4 (insufficient), $SD = 0.76$).

All participants gave their consent prior to the experiment after being informed in writing. Their participation in this study was anonymous and they received financial compensation for their participation. This study was approved by the Research Ethics Review Committee (CETO) of the Faculty of Arts of the University of Groningen.

[18] To be complete, in Frisian, word order in two-verb clusters is Participle-Auxiliary by default (Wurmbrand, 2004).

6.2.2 Materials

We created 24 test items: 12 superlative test items and 12 two-verb cluster test items. This resulted in 24 declarative sentences. Examples of the test items and the two target responses are presented in (**15**) and (16):

15. De patiënt heeft drie appels.
    'The patient has three apples.'
    Van deze drie appels is de wilde appel het _____. (natuurlijk)
    'Of these three apples, the wild apple is _____. (natural)'

    Target response morphological superlative:
    Van deze drie appels is de wilde appel het **natuurlijkst**.

    Target response syntactic superlative:
    Van deze drie appels is de wilde appel het **meest natuurlijk**.

16. Ik ken een student en een professor.
    'I know a student and a professor.'
    Ik denk dat van deze twee de student gisteren _____. (gedroomd)
    'I think that of these two, the students _____ (dreamed) yesterday.'

    Target response Participle-Auxiliary:
    Ik denk dat van deze twee de student gisteren **gedroomd heeft**.

    Target response Auxiliary-Participle:
    Ik denk dat van deze twee de student gisteren **heeft gedroomd**.

As in the processing and comprehension study, the test items were lexically matched, and the lexical material of the test items consisted of cognates between Dutch, German and English and only high-frequency words, based on the Hazenberg and Hulstijn list (Hazenberg & Hulstijn, 1996) (see **5.2.2 Materials**). The adjectives and verbs for the critical regions were carefully chosen based on the *Groningen Twitter Corpus* (Bouma, 2015). For the complete item selection process, see Chapter **3.3 Item Selection: Groningen Twitter Corpus**. Finally, we obtained grammaticality and plausibility judgements from five colleagues in Dutch Studies

with L1 Dutch, confirming the grammaticality and plausibility of both the superlative and two-verb cluster test items.

We used different types of distractor items and filler items for the experiment. The distractor items (see examples in (**17**)) were part of another experiment investigating subject/object asymmetries in long-distance wh-questions and consisted of 48 sentences which were all interrogative sentences.

17.

a. Wie denk je dat de mensen _____? (gezien)
'Who do you think the people _____? (seen)'

b. Wat denk je wie de mensen _____? (gezien)
'What do you think who the people _____? (seen)'

The fillers items (see examples in 18)), unrelated to the target structure, consisted of 32 sentences.

18.

a. Ik denk dat de auteur op dit moment aan de tekst _____. (werken)
'I think that the author in this moment on the text _____. (to work)'

b. De korte en de lange tekst zijn allebei _____. (complex)
'The short and the long text are both _____. (complex)'

c. Welke kat heeft de vader in de kamer _____? (zien)
'Which cat has the father _____ (to see) in the room?'

d. Wie kent de koning die de minister in de kamer _____? (horen)
'Who knows the king who _____ (to hear) the minister in the room?'

Twenty-four filler items were declarative sentences; 6 filler items were interrogative sentences. This resulted in a list of 104 items in total (**Appendix E: Items Production Study**). This experiment required one experimental list. The list contained all of the filler items (32), half of the distracter items (24) and all of the test items (12 for superlatives and 12 for two-verb clusters). The final list contained

48 declarative sentences and 32 interrogative sentences, randomised within the list, which adds up to 80 items in total that participants had to complete.

6.2.3 Procedure

We conducted a sentence completion task to investigate the production of the morphological and syntactic superlative, and the production of Participle-Auxiliary and Auxiliary-Participle for two-verb clusters. For this purpose, we employed LimeSurvey (Limesurvey GmbH), enabling remote testing of participants. The whole experiment took place online. Before the experimental task, participants filled in a questionnaire. The questionnaire consisted of questions on hearing, vision, cognitive disorders, handedness, age, gender, L1(s) and foreign languages, age of onset and years of acquisition of foreign languages, self-assessment L2 (English/German/Dutch) and L3 (Dutch) and professional activity (**Appendix B: Questionnaire Personal and Linguistic data**).

The order of the task as described here was the same for all participants. The task started with a shortened version of the Dutch children`s story *Jip en Janneke spleen samen* (*Jip en Janneke play together*) by Dutch author Annie M. G. Schmidt, which did not include superlatives or verb clusters, with the aim of activating participants' Dutch lexicon and grammar (see Grosjean (2001, 2010) for a discussion on the activation and deactivation of languages and the concept of *language modes*). This was followed by instructions in Dutch. For the exact wording of the instruction see **Appendix F: Participant Instructions Production Study**. To familiarise participants with the technique, this was followed by a practice session with eight practice items, unrelated to the target structure, before starting the experimental session. Participants would see the sentence on the screen with a gap at the end of the sentence. Putting the gap at the end of the sentence allows processing of the entire sentence before filling in the gap. The gap was long enough to fit several words, avoiding the possibility that production of the morphological form for the superlative test items as a result of a short gap. After the gap, participants would see the punctuation mark and a word in brackets: For superlative test items, this was an adjective in positive degree and for two-verb cluster test items, this was a participle. Since we were interested in word order variation in two-verb clusters, we decided to provide the participle instead of the infinitive for two-verb cluster test items. Providing the infinitive would have required two processes: first, transforming the infinitive into the participle and,

second, arranging the participle and auxiliary in the two-verb cluster. Participants were instructed to use the word in brackets when filling the gap. Moreover, participants were told that the word in brackets might be changed and a second word might be used to complete the sentence grammatically. The latter was done, again, to avoid prompting the production of the morphological form only for the superlative test items. Finally, participants were instructed to read the sentence and fill in the gap as quickly as possible. However, response times were not limited.

Participants received feedback in the form of a possible solution to the gap during the practice session, but not during the experimental session. Feedback comprised one word for half of the practice items and two words for the other half of the practice items. The task consisted of 80 sentences that were divided into two blocks of 40 sentences. Between each block, the experiment would pause for one minute after which participants could continue the experiment whenever they were ready. Participants needed around 30 minutes to complete the task.

After the experimental task, German-speaking participants took the English (L2) and Dutch (L3) version of the LexTALE test; English-speaking participants took the German (L2) and Dutch (L3) version of the LexTALE test (see **4.2.3 Procedure**). Note that English-speaking learners of L2 Dutch without knowledge of German took both tests, too. Finally, German-speaking learners, English-speaking learners and native speakers of Dutch completed a second questionnaire. This questionnaire included questions on the psychotypology of the participants (i.e., the language learners' perception of the linguistic proximity between the languages in question (Kellerman, 1983)) in their respective native language (see **Appendix A: Questionnaire Psychotypology**). Results show that German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L2 Dutch perceive German as closer to Dutch than English is to Dutch (see **Chapter 4. Psychotypology**).

6.2.4 Analysis: Sentence Completion Task

Before statistically analysing the data of the sentence completion task, we prepared the data. For superlatives, there were a total of 1560 responses (L1 speakers of Dutch = 696, German-speaking learners of L3 Dutch = 480, English-speaking learners of L3 Dutch = 204, English-speaking learners of L2 Dutch = 180). We excluded **non-interpretable** responses that we could not assign to either the morphological or syntactic superlative, resulting in the removal of 13 responses.

Moreover, we excluded responses including the **positive** of the adjective instead of its superlative (e.g., *het *natuurlijk*; *het *natuurlijk-e*), resulting in the removal of 80 responses. We also excluded responses including the **comparative** of the adjective instead of its superlative (e.g., *het *natuurlijk-er*, *het *natuurlijk-er-e*), resulting in the removal of 27 responses which all included the morphological comparative. We also excluded responses including the **adverb *minst*** (*less*) instead of the adverb *meest* (*most*), since there is no morphological alternative in Dutch, German and English. This concerned seven responses from L1 speakers of Dutch. Finally, that left us with 1433 (out of 1560) responses (L1 speakers of Dutch = 687, German-speaking learners of L3 Dutch = 437, English-speaking learners of L3 Dutch = 192, English-speaking learners of L2 Dutch = 117) for data analysis and a total exclusion rate of 8.33% (**Table 27**).

Table 27: *Superlative Test Items: Data Preparation*

data preparation	total resp.	L1_DUT				L3_DUT_L1_GER			
		no.	no. excl.	% excl.	no.	no.	no. excl.	% excl.	no.
non-interpretable	1560	696	0	0.00	696	480	2	0.42	478
positive	1547	696	2	0.29	694	478	32	6.69	446
comparative	1467	694	0	0.00	694	446	9	2.02	437
adverb *minst*	1440	694	7	1.01	687	437	0	0.00	437
total excl.			**9**	**1.30**			**43**	**9.13**	

Table 27: *Superlative Test Items: Data Preparation (continued)*

L3_DUT_L1_ENG				L2_DUT_L1_ENG				total excl.		no. resp. left
no.	no. excl.	% excl.	no.	no.	no. excl.	% excl.	no.	no.	%	
204	2	0.98	202	180	9	5.00	171	13	0.83	1547
202	4	1.98	198	171	42	24.56	129	80	5.17	1467
198	6	3.03	192	129	12	9.30	117	27	1.84	1440
192	0	0.00	192	117	0	0.00	117	7	0.49	1433
	12	**5.99**			**63**	**38.86**		**127**	**8.33**	

L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch.

From these 1433 responses, we did not exclude spelling mistakes that did not impede data analysis (L1 speakers of Dutch = 6 (0.87%), German-speaking learners of L3 Dutch = 36 (8.24%), English-speaking learners of L3 Dutch = 15 (7.81%), English-speaking learners of L2 Dutch = 5 (4.27%)). Examples are **creatifste*

(*creatiefste*) and **meest emotioneele* (*meest emotionele*). Moreover, we did not exclude responses showing inflection on the superlatives (e.g., *het *natuurlijk-st-e*; *het meest *natuurlijk-e*): L1_DUT = 30 (4.37%), German-speaking learners of L3 Dutch = 158 (36.16%), English-speaking learners of L3 Dutch = 104 (54.17%) and English-speaking learners of L2 Dutch = 68 (58.12%). We also did not exclude responses including the German intensifier *meist* (*most*) instead of its Dutch equivalent *meest* (e.g., *het *meist natuurlijk*). This includes eleven responses (5.73%) from English-speaking learners of L3 Dutch from one participant. For the sake of completeness, we also did not exclude responses including the German superlative-suffix *-sten* (three responses (0.69%) from German-speaking learners of L3 Dutch), and the English superlative-suffix *-est* (four responses (2.08%) from English-speaking learners of L3 Dutch, and one response (0.85%) from English-speaking learners of L2 Dutch).

For two-verb clusters, there were a total of 1560 responses (L1 speakers of Dutch = 696, German-speaking learners of L3 Dutch = 480, English-speaking learners of L3 Dutch = 204, English-speaking learners of L2 Dutch = 180). We excluded **non-interpretable** responses that we could not assign to either Participle-Auxiliary or Auxiliary-Participle, resulting in the removal of 10 responses. Moreover, we excluded responses including **simple past** instead of present perfect (e.g., *droomde*), resulting in the removal of 82 responses. Responses including simple past reflect an experimental artefact, since simple past is grammatical in the context of the two-verb cluster test items. Note that we did not exclude responses including past perfect (e.g., *had gedroomd* / *gedroomd had*), since the order of two-verb clusters follows the same rules in past perfect subordinate clauses as in present perfect subordinate clauses in Dutch, German and English. We also excluded responses including only the **participle** and not including the auxiliary (e.g., *gedroomd*), resulting in the removal of 64 responses. This resulted in 1404 (out of 1560) responses (L1 speakers of Dutch = 641, German-speaking learners of L3 Dutch = 447, English-speaking learners of L3 Dutch = 188, English-speaking learners of L2 Dutch = 128) remaining for data analysis and a total exclusion rate of 10.29% (**Table 28**).

Table 28: *Two-Verb Cluster Test Items: Data Preparation*

data preparation	total resp.	L1_DUT				L3_DUT_L1_GER			
		no.	no. excl.	% excl.	no.	no.	no. excl.	% excl.	no.
non-interpretable	1560	696	0	0.00	696	480	0	0.00	480
simple past	1550	696	53	7.61	643	480	14	2.92	466
participle	1468	643	2	0.31	641	466	19	4.08	447
total excl.			**55**	**7.93**			33	6.99	

Table 28: *Two-Verb Cluster Test Items: Data Preparation (continued)*

L3_DUT_L1_ENG				L2_DUT_L1_ENG				total excl.		no. resp. left
no.	no. excl.	% excl.	no.	no.	no. excl.	% excl.	no.	no.	%	
204	5	2.45	199	180	5	2.78	175	10	0.64	1550
199	5	2.51	194	175	10	5.71	165	82	5.29	1468
194	6	3.09	188	165	37	22.42	128	64	4.36	1404
	16	**8.06**			**52**	**30.92**		**156**	**10.29**	

L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch.

From these 1404 responses, we did not exclude spelling mistakes that did not impede data analysis (L1 speakers of Dutch = 7 (1.09%), German-speaking learners of L3 Dutch = 28 (6.26%), English-speaking learners of L3 Dutch = 9 (4.79%), English-speaking learners of L2 Dutch = 14 (10.94%)). For example, **gedrungen heeft* (*gedronken heeft*) and **heeft gelaches* (*heeft gelachen*). Moreover, we did not exclude responses including a form of the auxiliary *to be* instead of a form of the auxiliary *to have* (e.g., **is gedroomd* / *gedroomd* **is*): L1 speakers of Dutch = 2 (0.31%), German-speaking learners of L3 Dutch = 25 (5.59%), English-speaking learners of L3 Dutch = 7 (3.72%), English-speaking learners of L2 Dutch = 12 (9.38%). In most cases this concerned the verb *zwemmen* (*to swim*) which is formed with the auxiliary *to be* in German present perfect: L1 speakers of Dutch = 0 out of 2, German-speaking learners of L3 Dutch = 24 out of 25, English-speaking learners of L3 Dutch = 4 out of 7 and English-speaking learners of L2 Dutch = 1 out of 11.

After data preparation, the data were statistically analysed with *R* (R Core Team, 2023). The sentence completion data were analysed by means of binomial generalised linear mixed-effects models, using the package *lme4* (Bates et al., 2015). Responses for the morphological superlative and Participle-Auxiliary are coded as 0, while responses for the syntactic superlative and Auxiliary-Participle are coded as 1. Thus, a negative intercept suggests that, holding all other factors

constant, the morphological superlative/Participle-Auxiliary is more likely to occur compared to the syntactic superlative/Auxiliary-Participle. Conversely, a positive intercept indicates that the morphological superlative/Participle-Auxiliary is less likely relative to the syntactic superlative/Auxiliary-Participle. We used the fixed effect Group and used reverse Helmert contrast coding, using the package *stats* (R Core Team, 2023), making the following contrasts:

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER
- Group3: L2_DUT_L1_ENG, L3_DUT_L1_ENG & L3_DUT_L1_GER vs. L1_DUT.

Reverse Helmert contrast coding compares each level of Group to the mean of previous levels of Group. The first group hence reflects the contrast between English-speaking learners of Dutch as either L2 or L3, the second group reflects the contrast between English-speaking learners of Dutch and German-speaking learners of L3 Dutch, and, finally, the third group reflects the contrast between learners of Dutch and L1 speakers of Dutch.

To investigate the main effect for Group, we performed pairwise comparisons using the package *emmeans* (Lenth, 2021) with Tukey adjustments. To investigate whether there is a significant association between Group and production response (i.e., morphological superlative or syntactic superlative, and Participle-Auxiliary or Auxiliary-Participle for two-verb clusters), we used chi-square tests of independence. We added random intercepts and slopes for Subject and Itemset to the models and kept the random effect structure as maximal as possible (Barr et al., 2013), only removing terms when the models would not converge or when the correlations between the random effect components were +/- 1. To extract model coefficients by Subject and by Itemset, we used the function *coef* in R (Chambers & Hastie, 1992) (see **5.2.4 Analysis: Grammaticality Judgement Task**). We checked model assumptions using the *performance* package (Lüdecke et al., 2021) and the *DHARMa* package (Hartig, 2022). We always added the covariates Trial Order (coded SeqTrial.c) and List to the maximal model and checked whether it should be included in the model by performing model comparisons (see Baayen et al., 2008). Neither Seqtrial.c nor List significantly improved the model fit and therefore neither was included in the final models. We also tested whether the LexTALE scores for Dutch or the L2 (German/English) should be added to the models by means of model comparisons, in order to test for an effect of L3

proficiency (coded LextaleDUT) and L2 proficiency (coded LextaleL2) in L3 morphosyntactic transfer. Since we only had LexTALE scores for non-native speakers, we ran a new model with only the three groups of non-native speakers using reverse Helmert contrast coding for Group once again, making the following contrasts (see above):

- Group1: L2_DUT_L1_ENG vs. L3_DUT_L1_ENG
- Group2: L2_DUT_L1_ENG & L3_DUT_L1_ENG vs. L3_DUT_L1_GER

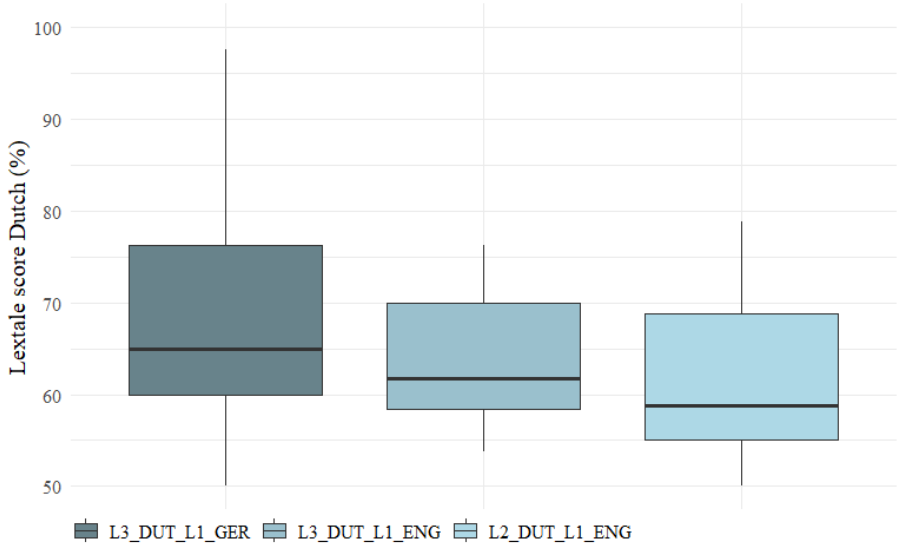
Neither LextaleDUT nor LextaleL2 significantly improve the model fit and therefore neither was included in the final models. Note that there was a marginal improvement for the inclusion of LextaleL2 for the two-verb cluster responses (p. = .071).

6.3 Results

6.3.1 Language Proficiency Dutch and L2

The LexTALE scores for Dutch for the three groups of learners of Dutch are shown in **Figure 28**. For German-speaking learners of Dutch with L2 English, and English-speaking learners of Dutch with L2 German, Dutch is the L3 after L1 German/English and L2 English/German; and for English-speaking learners of Dutch without knowledge of German, Dutch is the L2 after L1 English. The LexTALE scores for the L2 for German-speaking (L2 English) and English-speaking (L2 German) learners of L3 Dutch are shown in **Figure 29**.

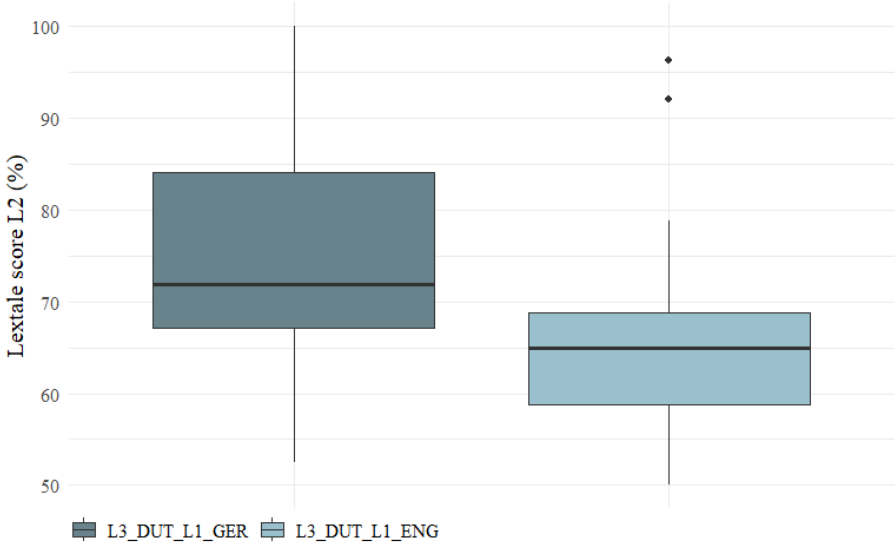
Figure 28: *LexTALE Scores for L3 Dutch for German-Speaking Learners with L2 English and English-Speaking Learners with L2 German, and LexTALE Scores for L2 Dutch for English-Speaking Learners.*



L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch.

The LexTALE score for Dutch was *M* = 67.43, *SD* = 11.21; 95% CI [66.69, 68.16], (upper intermediate) for German-speaking learners of L3 Dutch, *M* = 63.00, *SD* = 8.62, 95% CI [62.16, 63.84], (upper intermediate) for English-speaking learners of L3 Dutch, and *M* = 60.08, *SD* = 8.21, 95% CI [59.23, 60.93], (upper intermediate) for English-speaking learners of L2 Dutch. Pairwise comparisons between Group showed that all three groups significantly differed from each other in terms of LexTALE scores for Dutch (p = < .001).

Figure 29: *LexTALE Scores for L2s for Learners of L3 Dutch, English and German, Respectively*



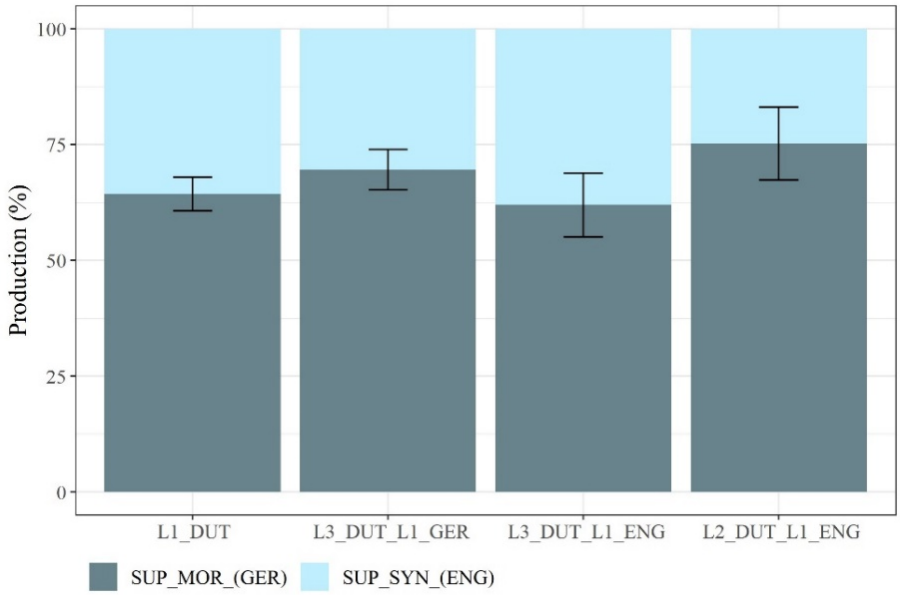
L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English; L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German.

The LexTALE score for L2 English was *M* = 74.60, *SD* = 13.64, 95% CI [73.70, 75.49], (upper intermediate) for German-speaking learners of L3 Dutch, and for L2 German *M* = 66.81, *SD* = 12.35, 95% CI [65.61, 68.01] (upper intermediate) for English-speaking learners of L3 Dutch. Again, pairwise comparisons between Group showed that the two groups significantly differed from each other in terms of LexTALE scores for the L2 (p = < .001).

6.3.2 Sentence Completion Task: Superlatives

The results of the responses to the sentence completion task for the morphological superlative and the syntactic superlative are shown in **Figure 30** and the results of the final model with the results of the statistical analysis are summarised in **Table 29**.

Figure 30: *Superlatives: Percentage of Production Responses and 95% CIs*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; SUP_MOR_(GER) = morphological superlatives, SUP_SYN_(ENG) = syntactic superlatives.

Table 29: *Superlatives: Model Summary for Sentence Completion Responses*

Model: Response ~ Group + (1 | Subject) + (1 | Itemno.)			
Component	Estimate	Standard error	t-value
Intercept	-2.88	0.55	< 0.01***
Group1	1.08	0.95	0.26
Group2	0.12	0.40	0.77
Group3	0.38	0.22	0.09 ·

As can be seen in **Figure 30**, both the morphological superlative and the syntactic superlative are produced by all four groups, however, the morphological form *natuurlijkst* is produced more frequently than the syntactic form *meest natuurlijk*: L1 speakers of Dutch: morphological superlative: *M* = 64.34, *SD* = 0.48, syntactic superlative: *M* = 35.66, *SD* = 0.48; German-speaking learners of L3 Dutch: morphological superlative: *M* = 69.57, *SD* = 0.46, syntactic superlative: *M* = 30.43,

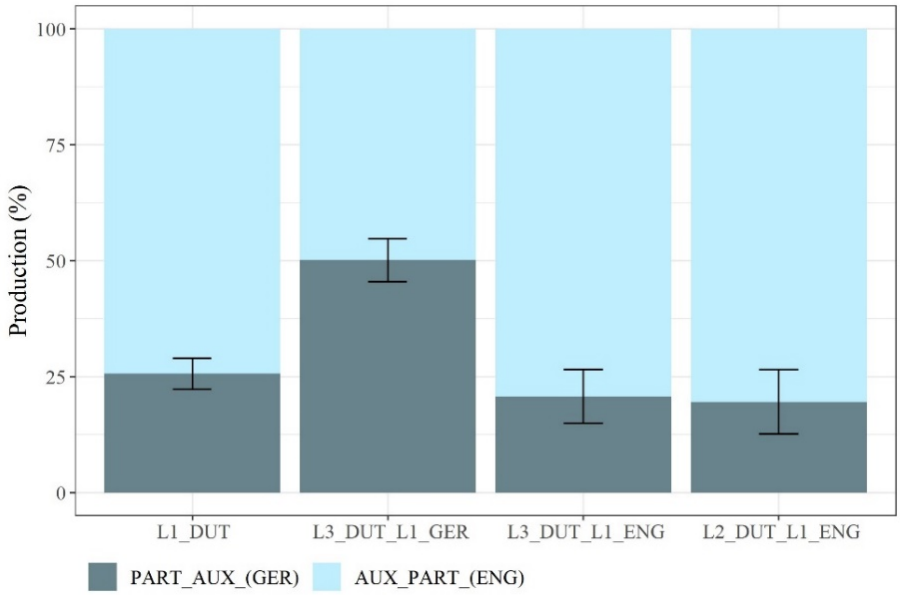
SD = 0.46; English-speaking learners of L3 Dutch: morphological superlative: *M* = 61.98, *SD* = 0.49, syntactic superlative: *M* = 38.02, *SD* = 0.49; English-speaking learners of L2 Dutch: morphological superlative: *M* = 75.21, *SD* = 0.43, syntactic superlative: *M* = 24.79, *SD* = 0.43.

For the production responses of the morphological superlative and the syntactic superlative, there was no main effect for Group. The four groups did not differ significantly in the distribution of the production of the morphological superlative and the syntactic superlative. However, there was a marginal effect for Group3, the contrast between learners of Dutch and L1 speakers of Dutch: L1 speakers of Dutch overall produced numerically more syntactic superlatives than learners of Dutch, but the difference between L1 speakers of Dutch and learners of Dutch was not significant. Post-hoc pairwise comparison between the morphological superlative and the syntactic superlative showed that all four groups produced the morphological superlative significantly more frequently than the syntactic superlative ($p = < .001$).

6.3.3 Sentence Completion Task: Two-Verb Clusters

The results of the responses to the sentence completion task for Participle-Auxiliary and Auxiliary-Participle for the two-verb clusters are shown in **Figure 31** and the results of the final model with the results of the statistical analysis are summarised in **Table 30**.

Figure 31: *Two-Verb Clusters: Percentage of Production Responses and 95% CIs*



L1_DUT = L1 speakers of Dutch, L3_DUT_L1_GER = German-speaking learners of L3 Dutch with L2 English, L3_DUT_L1_ENG = English-speaking learners of L3 Dutch with L2 German; L2_DUT_L1_ENG = English-speaking learners of L2 Dutch; PART_AUX_(GER) = Participle-Auxiliary clusters, AUX_PART_(ENG) = Auxiliary-Participle clusters.

Table 30: *Two-Verb Clusters: Model Summary for Sentence Completion Responses*

Model: Response ~ Group + (1 | Subject) + (1 | Itemno.)			
Component	Estimate	Standard error	t-value
Intercept	5.01	0.94	< 0.01***
Group1	< 0.01	1.72	0.96
Group2	-2.29	0.68	< 0.01***
Group3	0.30	0.40	0.46

As can be seen in **Figure 31**, both Participle-Auxiliary and the Auxiliary-Participle are produced by all four groups, but to different degrees: L1 speakers of Dutch: Participle-Auxiliary: *M* = 25.59, *SD* = 0.44, Auxiliary-Participle: *M* = 74.41, *SD* = 0.44; German-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 50.11, *SD* = 0.50, Auxiliary-Participle: *M* = 49.89, *SD* = 0.50; English-speaking learners of L3 Dutch: Participle-Auxiliary: *M* = 20.74, *SD* = 0.41, Auxiliary-Participle: *M* =

79.26, *SD* = 0.41; English-speaking learners of L2 Dutch: Participle-Auxiliary: *M* = 19.53, *SD* = 0.40, Auxiliary-Participle: *M* = 80.47, *SD* = 0.40. Thus, both forms of the two-verb-clusters, Participle-Auxiliary *gedroomd heeft* and Auxiliary-Participle *heeft gedroomd* are produced by all groups, however, Participle-Auxiliary *gedroomd heeft* is less produced that Auxiliary-Participle *heeft gedroomd* by L1 speakers of Dutch and both groups of English-speaking learners of Dutch. German-speaking learners of L3 Dutch produce Participle-Auxiliary and Auxiliary-Participle to the same extent.

For the production responses of Participle-Auxiliary and Auxiliary-Participle for the two-verb clusters, there was a main effect for Group, the contrast between the two groups of English-speaking learners of Dutch (English-speaking learners of L2 Dutch and English-speaking learners of L3 Dutch) and the German-speaking learners of L3 Dutch (Group2). The significant contrast for Group2 indicates that the two groups of English-speaking learners of Dutch differ significantly from German-speaking learners of L3 Dutch in their preference for Auxiliary-Participle over Participle-Auxiliary. Post-hoc pairwise comparisons between Group showed that German-speaking learners of L3 Dutch produced Participle-Auxiliary significantly more frequently than L1 speakers of Dutch (p = < .001) and English-speaking learners of L3 Dutch (p = .040). The contrast between German-speaking learners of L3 Dutch and English-speaking learners of L2 Dutch was only marginally significant (p = .060). However, the low p-value for the contrast between German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch, and the marginal significance for the contrast between German-speaking learners of L3 Dutch and English-speaking learners of L2 Dutch might be due to the low number of participants in the two groups of English-speaking learners of Dutch compared to the German-speaking learners of L3 Dutch. Data visualisation (see **Figure 31**) clearly shows that German-speaking learners of L3 Dutch differ from all other groups in the production of Participle-Auxiliary and Auxiliary-Participle. Post-hoc pairwise comparison between Participle-Auxiliary and Auxiliary-Participle showed that all groups (p = < .001) but German-speaking learners of L3 Dutch (p = .962) produced Auxiliary-Participle significantly more frequently than Participle-Auxiliary.

6.4 Discussion

The aim of this study was to investigate which model of L3 morphosyntactic transfer, the Typological Primacy Model or the L2 Status Factor Hypothesis, best predicts morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 production. If the Typological Primacy Model best predicts morphosyntactic transfer in L3 acquisition, we should find different transfer patterns in German-speaking and English-speaking learners of L3 Dutch. However, if the L2 Status Factor Hypothesis best predicts morphosyntactic transfer in L3 acquisition, we should find similar transfer patterns in German-speaking and English-speaking learners of L3 Dutch. In line with the literature, we formulated the following hypotheses:

(**H.1**) If the **Typological Primacy Model** best predicts morphosyntactic transfer into the L3, both groups of learners of L3 Dutch will transfer from German, and exclusively produce the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

(**H.2**) If the **L2 Status Factor Hypothesis** best predicts morphosyntactic transfer into the L3, learners of L3 Dutch with L1 German will transfer from L2 English, and exclusively produce the syntactic superlative (*de meest natuurlijke appel*) and Auxiliary-Participle clusters (*heeft gedroomd*). Learners of L3 Dutch with L1 English will transfer from L2 German, and exclusively produce the morphological superlative (*de natuurlijkste appel*) and Participle-Auxiliary clusters (*gedroomd heeft*).

Furthermore, we investigated whether we can replicate the results in different linguistic properties (superlatives and two-verb clusters) (SQ.2), and to what extent morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2 (SQ.4). We will first discuss the results regarding the superlatives, then discuss the results regarding the two-verb clusters, and finally discuss the overall results by comparing the results of the two linguistic properties.

6.4.1 Superlatives

Based on the literature, we would expect that L1 speakers of Dutch will produce both the morphological superlative (*natuurlijkste*) and the syntactic superlative (*meest natuurlijke*), as both forms are available in Dutch. However, we would also expect that the morphological superlative is produced more frequently than the syntactic superlative, since the morphological superlative overall is more frequent in Dutch (see **3.1 Superlatives**). This is what we find in our data. L1 speakers of Dutch do produce the morphological superlative more frequently than the syntactic superlative. Firstly, we can conclude that both the morphological superlative and the syntactic superlative are present in our Dutch data. However, our results are not entirely consistent with the literature on the distribution of morphological and syntactical superlatives. Neither, though, are they so much in contrast as to be surprising. The distribution between the morphological superlative (64.34%) and the syntactic superlative (35.66%) in our results does not match what is found by Karsdorp and Beekhuizen (2010): morphological superlative 89.64% and syntactic superlative 10.36%, and by Kiers (2014): morphological superlative 90.52% and syntactic superlative 9.48%. Still, in our results, the morphological superlative is produced more frequently than the syntactic superlative, which is consistent with the overall trend observed in the literature. The fact that the syntactic superlative is produced more frequently in our study than expected based on the literature (35.66% vs. 10.36% and 9.48%) might be due to the fact that we used trisyllabic and polysyllabic adjectives in our study. With trisyllabic and polysyllabic adjectives, there is an increasing tendency for the syntactic superlative as compared to monosyllabic and disyllabic adjectives (see **3.1 Superlatives** and **Table 4**). Taking the results of Karsdorp and Beekhuizen (2010) for adjectives with three and four syllables together, the morphological superlative has a much smaller frequency (28.35%) and the syntactic superlative has a much higher frequency (71.65%). This tendency is well reflected in our data. Moreover, mainly Dutch university students with an average age of approximately 21 years participated in our study. The influence of English on Dutch society is constantly increasing, especially on university students in the Netherlands (see, e.g., Michel et al., 2021; Michel, 2022), and we can assume that this is also reflected in the production of superlatives found in our results, due to language contact and reverse transfer (i.e., transfer from L2 or L3 into L1, see **2.1.1 L3 Acquisition**). Furthermore, the studies by Karsdorp and Beekhuizen (2010) and Kiers (2014) are based on corpora containing material from

a wide variety of speakers and from different periods of time (Karsdorp & Beekhuizen (2010): *Corpus of Spoken Dutch*, 1999–2003; Kiers (2014): *Corpus of Contemporary Dutch*, 1970–2013). However, studies investigating the distribution between the morphological and the syntactic superlative in Dutch as well as the factors involved are scarce and the overall picture is not yet clear. Moreover, it might also be the case that we see an experimental artefact in our data. The corpus data might provide a more reliable reflection of the distribution of the morphological and syntactic superlative in Dutch because it includes natural language from a broader range of speakers and time periods. The limited scope of our experiment might not accurately represent the true distribution and usage patterns found in natural language.

In German-speaking and English-speaking learners of L3 Dutch, we see the same pattern as in L1 speakers of Dutch. Both groups of learners of L3 Dutch produce the morphological superlative, that is the German form, significantly more frequently than the syntactic superlative, that is the English form. Since both groups of learners of L3 Dutch seem to select the typologically closer language, German, as the source of morphosyntactic transfer into L3 Dutch, this might suggest support for the Typological Primacy Model and represent evidence against the L2 Status Factor Hypothesis. The fact that the two groups of learners of L3 Dutch do not differ in their pattern supports the idea that there is no evidence for the L2 Status Factor Hypothesis in our data. However, although both groups of learners of L3 Dutch produce the morphological superlative more frequently than the syntactic superlative, both groups do also produce the syntactic superlative, though to a lesser extent. Keep in mind that within the nondefault transfer models (i.e., Cumulative Enhancement Model, Typological Primacy Model, Linguistic Proximity Model and Scalpel Model), the Typological Primacy Model "stands alone by stipulating that one or the other language, but crucially not both, is selected as the initial source of transfer in all domains of L3 morphosyntactic representation" (Rothman et al., 2019, p. 155). Thus, our data cannot be explained by the Typological Primacy Model alone. Nevertheless, it seems that typological proximity does play an important role in L3 morphosyntactic transfer, since both groups of learners of L3 Dutch produce the morphological superlative more frequently than the syntactic superlative.

In summary, the results of the sentence completion task do not suggest support for the L2 Status Factor Hypothesis in the two groups of learners of L3 Dutch. While, on the other hand, there is support for the Typological Primacy Model to be

found in our data, our findings cannot be solely explained by the Typological Primacy Model.

6.4.2 Two-Verb Clusters

In accordance with the literature, we would expect that L1 speakers of Dutch will produce both Participle-Auxiliary (*gedroomd heeft*) and Auxiliary-Participle (*heeft gedroomd*), as both forms are available in Dutch. However, we would also expect that Participle-Auxiliary is produced less frequently than Auxiliary-Participle (see **3.2 Two-Verb Clusters**). This is what we find in our data. L1 speakers of Dutch produce Auxiliary-Participle more frequently than Participle-Auxiliary. Firstly, we can conclude that both Auxiliary-Participle and Participle-Auxiliary are present in our Dutch data. Moreover, our results are compatible with the literature on two-verb cluster variation. Auxiliary-Participle is more dominant in written Dutch as well as in formal Dutch. In the sentence completion task, participants had to fill in the gaps in writing and we argue that the experimental environment of the experiment is perceived as rather formal. The distribution between Auxiliary-Participle (74.41%) and Participle-Auxiliary (25.59%) in our results matches what is found in written Dutch by Arfs (2007) and De Sutter (2005): Auxiliary-Participle 72.1% and 66.7%, Participle-Auxiliary 27.9% and 33.3 %, and also in formal Dutch by De Sutter (2005): Auxiliary-Participle 71.2% and Participle-Auxiliary 28.8%.

In English-speaking learners of L3 Dutch we see the same pattern as in L1 speakers of Dutch. English-speaking learners of L3 Dutch produce Participle-Auxiliary, that is, the German from, less frequently than Auxiliary-Participle, that is, the English form, representing no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis. In German-speaking learners of L3 Dutch, there is no significant difference between the two realisations. The lack of significant difference in German-speaking learners of L3 could be interpreted as indicating no specific evidence for any form of morphosyntactic transfer in our data. German-speaking learners of L3 Dutch might have recognised that both Participle-Auxiliary and Auxiliary-Participle are grammatical in Dutch. Alternatively, the results of the sentence completion task might indicate that in German-speaking learners of L3 Dutch both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, with neither being blocked. Therefore these results represent no evidence for either the Typological Primacy Model or the

L2 Status Factor Hypothesis (see **5.4.1 Superlatives** and **5.4.2 Two-Verb Clusters**).

In summary, the results of the sentence completion task do not suggest support for either the L2 Status Factor Hypothesis or the Typological Primacy Model the in the two groups of learners of L3 Dutch.

6.5 Conclusion

The results of our study on the production of Dutch superlatives in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch represent evidence against the L2 Status Factor Hypothesis but are consistent with the Typological Primacy Model. However, the results cannot be explained by the Typological Primacy Model alone. The results of our study on the production of Dutch two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch do not suggest support for either the Typological Primacy Model or the L2 Status Factor Hypothesis. In the general discussion of this dissertation, we will interpret our findings in the context of alternative models and factors of morphosyntactic transfer in L3 acquisition (see **Chapter 7. General Discussion and Conclusion**). Additionally, we consider the results of the processing and comprehension of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch (see **Chapter 5. Processing and Comprehension**), which provide further insight into the complexities of morphosyntactic transfer into the L3.

CHAPTER 7. GENERAL DISCUSSION AND CONCLUSION

In this chapter, we discuss the overall results on the perception of the typological proximity between Dutch, German and English, as well as on the processing and comprehension, and production of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch. This dissertation investigates L3 morphosyntactic transfer between the closely related West Germanic languages Dutch, German, and English, specifically testing the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) against the Typological Primacy Model (Rothman, 2011, 2015) (see **2.2 Models of L3 Morphosyntactic Transfer**). The overarching research question of this dissertation is:

(RQ) Which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition?

Furthermore, we examined the perception of German-speaking and English-speaking learners of L3 Dutch of the typological proximity between Dutch, German and English (SQ.1). Moreover, we investigated to what extent (wholesale vs. piecemeal) different linguistic properties (superlatives and two-verb clusters) are affected (SQ.2), what differences emerge in morphosyntactic transfer into the L3 in language processing and comprehension, and language production (SQ.3), and to what extent morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2 (SQ.4). We first discuss the findings of this dissertation and answer the overarching research question as well as our sub-questions. We also consider whether other models and factors of L3 morphosyntactic transfer might better explain our findings (see **7.1 Theoretical Discussion**). We subsequently address the methodology used in this dissertation in terms of whether methodological choices might have had an impact on the results of the dissertation and draw implications for future research (see **7.2 Methodological Implications**). We then discuss the pedagogical implications of

our findings (see **7.3 Pedagogical Implications**). Finally, we summarise this dissertation with a general conclusion (see **7.4 Conclusion**).

7.1 Theoretical Discussion

In the study on the perception of the typological proximity between Dutch, German and English, we find the answer to our first sub-question: German-speaking and English-speaking learners of L3 Dutch perceive German as closer to Dutch than English is to Dutch (SQ.1). This perception in both groups of learners of L3 Dutch is based on the factor *vocabulary*, which is consistent with Vismans and Wenzel (2012). Moreover, we find that L1 speakers of Dutch do not differ from German-speaking and English-speaking learners of L3 Dutch in these respects. However, L1 speakers of Dutch differ from German-speaking and English-speaking learners of L3 Dutch in the languages they perceive as close to Dutch after German. While German-speaking and English-speaking learners of L3 Dutch show a historical ranking (i.e., English stands between Dutch and German, on one side, and the North Germanic languages Danish and Swedish, on the other), L1 speakers of Dutch show a comparative ranking (i.e., the North Germanic languages occupy a place between Dutch and German, on one side, and English, on the other). Furthermore, we find that English-speaking learners of L3 Dutch do not differ in their perception of the general, syntactic and morphological typology between Dutch, German and English. In German-speaking learners of L3 Dutch, however, English is put significantly more often in first place regarding syntactic and morphological psychotypology. Nevertheless, in both linguistic domains, English is not perceived as closer to Dutch than German is to Dutch (see **Chapter 4. Psychotypology**). As a result, we can conclude that the typological proximity and the psychotypological proximity between Dutch, German and English in German-speaking and English-speaking learners of L3 Dutch indeed is the same (Rothman & Cabrelli Amari, 2010; Rothman, 2011, 2015; González Alonso & Rothman, 2017; see also Rothman et al., 2019), and we can assume that in both groups of learners of L3 Dutch, German is the language that has the stronger influence on Dutch (Rothman, 2011; Slabakova, 2017). However, we find evidence for a strong influence from German in both groups of learners of L3 Dutch only in the superlative data of the self-paced reading task and the sentence completion task (see below).

The general results of the processing and comprehension study (see **5.3 Results**), and production study (see **6.3 Results**) are summarised in **Table 31**:

Table 31: *Summary of Results on the Processing, Comprehension and Production of Dutch Superlatives and Two-Verb Clusters in German-Speaking and English-Speaking Learners of L3 Dutch*

Study	Task	Linguistic property	German-speaking learners of L3 Dutch	English-speaking learners of L3 Dutch
processing & comprehension	grammaticality judgement task (scores)	superlative	L1 & L2	L1 & L2
		two-verb cluster	L1 & L2	L1 & L2
	grammaticality judgement task (RTs)	superlative	L1 & L2	L1 & L2
		two-verb cluster	L1 & L2	L1 & L2
	self-paced reading task (RTs)	superlative	L1 German	L2 German
		two-verb cluster	L1 & L2	L1 English
production	sentence completion task	superlative	L1 German	L2 German
		two-verb cluster	L1 & L2	L1 English

L1 & L2 = both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, L1 German/L2 German = preference for German structure (morphological superlative/Participle-Auxiliary) in L3 Dutch, L1 English = preference for English structure (syntactic superlative/Auxiliary-Participle) in L3 Dutch.

As can be seen in **Table 31**, there are recurring patterns in the two groups of learners of L3 Dutch regarding the two linguistic properties across the different tasks. In both the scores and the RTs of the grammaticality judgement task, there is no significant difference between the two conditions of the superlative and two-verb clusters among German-speaking and English-speaking learners of L3 Dutch. We argue that this lack of significant difference could be interpreted as indicating no specific evidence for any form of morphosyntactic transfer in our data. Both groups of learners of L3 Dutch might have learned that both conditions of the superlative and the two-verb clusters are grammatical in Dutch. Alternatively, it might suggest that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, indicating that neither is blocked (Westergaard et al., 2017). Consequently, these results provide no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis.

In both the self-paced reading task and the sentence completion task, German-speaking and English-speaking learners of L3 Dutch show a preference for the morphological superlative, that is the German form, over the syntactic superlative,

that is, the English form, in L3 Dutch. Since both groups of learners of L3 Dutch seem to select the typologically closer language, German, as the source of morphosyntactic transfer into L3 Dutch, this might suggest support for the Typological Primacy Model and represent evidence against the L2 Status Factor Hypothesis. However, in the sentence completion task, although producing the morphological superlative more frequently, both groups of learners of L3 Dutch produce the syntactic superlative as well, which represents evidence against the Typological Primacy Model, or at least a strict interpretation of it (Rothman et al., 2019).

For two-verb clusters, German speaking learners of L3 Dutch show no significant difference between Participle-Auxiliary and Auxiliary-Participle in both the self-paced reading task and the sentence completion task, either indicating no specific evidence for any form of morphosyntactic transfer in our data, or suggesting that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3 (see above). Consequently, these results provide no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis. English-speaking learners of L3 Dutch, on the other hand, show a significant preference for Auxiliary-Participle, that is, the English from, in both the self-paced reading task and the sentence production task. Since English is typologically more distant from Dutch than German, and the L1 of English-speaking learners of L3 Dutch, this neither supports the Typological Primacy Model nor the L2 Status Factor Hypothesis.

It can be seen that within the two groups of learners of L3 Dutch, there is no difference in the preference patterns for superlatives and two-verb clusters when comparing the results of the self-paced reading task and the sentence completion task. Thus, we can answer our third sub-question: We find no differences in morphosyntactic transfer into the L3 between language processing and language production tasks (SQ.3). Moreover, there is no evidence in our data that the L2 is more accessible for L3 production than for L3 processing or comprehension (Puig-Mayenco et al., 2020; see **2.2.7 Discussion of Models of L3 Morphosyntactic Transfer**). However, there is a difference between the grammaticality judgement task, on the one hand, and the self-paced reading task and the sentence completion task, on the other. Possible methodological explanations for this difference are discussed in the methodological discussion of this dissertation (see **7.2 Methodological Implications).**

We can summarise the results of the processing and comprehension study, and the production study as follows. First, our data overall do not suggest evidence for the L2 Status Factor Hypothesis. Rothman (2011) raised the question whether or not there is indeed an L2 effect if the L1 and the L2 are both closely related to the L3. This is not what we find in our data. Second, our data do suggest evidence for the Typological Primacy Model for superlatives in the self-paced reading task and the sentence completion task. However, although we find evidence for the Typological Primacy Model in our data, other models and factors of L3 morphosyntactic transfer might also explain these findings (see below). Consequently, we can answer the overarching research question of this dissertation (RQ) by stating that neither the Typological Primacy Model nor the L2 Status Factor Hypothesis best predicts our data on morphosyntactic transfer between the closely related languages German, English and Dutch in L3 acquisition. It might be that factors other than the L2 status or typological proximity play a role in morphosyntactic transfer into the L3 if the L1 and the L2 are both closely related to the L3. Other scenarios considered are L1 default transfer, the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b) and the Scalpel Model (Slabakova, 2017). We do not take the Cumulative Enhancement Model (Flynn et al., 2004) into account since it argues that negative transfer does not exist, whereas numerous studies have shown evidence for negative transfer (see Chapter **2.2.3 Cumulative Enhancement Model**).

Firstly, our data do not suggest evidence for default L1 transfer (e.g., Lozano, 2003; Jin, 2009; Na Ranong & Leung, 2009; Hermas, 2010, 2014, 2015). Regarding both the grammaticality judgement scores and the grammaticality judgement RTs, there is no significant difference between the two conditions in both the superlative and two-verb cluster data among German-speaking and English-speaking learners of L3 Dutch. In both groups of learners of L3 Dutch, the L2 property is not rejected. Thus, there is no indication of exclusive transfer from their L1. Regarding both the self-paced reading task and the sentence completion task, we find that both groups of learners of L3 Dutch show a preference for morphological superlatives, that is, the German form, over syntactic superlatives. For German-speaking learners of L3 Dutch, this might indicate a strong role of the L1 and, thus, suggest support for default L1 transfer. However, German-speaking learners of L3 Dutch also produce the syntactic superlative from their L2 in the sentence completion task. Moreover, for English-speaking learners of L3 Dutch, the morphological superlative is the default in their L2 German, representing evidence against a strong role for the L1

in morphosyntactic transfer into the L3. For two-verb clusters, we find that English-speaking learners of L3 Dutch show a significant preference for Auxiliary-Participle, that is, the English form, over Participle-Auxiliary. This suggest that the L1 might play a role in morphosyntactic transfer into the L3, since it seems to have a strong effect in English-speaking learners of L3 Dutch. Adding weight to this, the L1 property is also produced by German-speaking learners of L3 Dutch in the sentence completion task. However, possible transfer is also found from the L2, and they show no significant difference between Participle-Auxiliary and Auxiliary-Participle in both tasks. Furthermore, English-speaking learners of L3 Dutch also produce Participle-Auxiliary from their L2 in the sentence completion task. Thus, overall, there is no indication of exclusive transfer from the L1 in either the self-paced reading task or the sentence completion task.

As an interim result, we can therefore conclude that none of the models of L3 morphosyntactic transfer predicting wholesale transfer (L1 *or* L2), that is, default L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis, and the Typological Primacy Model, can be fully supported by our data. Although our data suggests some evidence for the Typological Primacy Model, the results might also be explained by additional factors. Above that, our data suggest that both the L1 and the L2 might be available for morphosyntactic transfer into the L3. This is also supported by the fact that our data suggest individual participant variation across all tasks. More individual variation in the data suggests that the results are not due to morphosyntactic transfer from one language or another, but to factors within the participants (e.g., proficiency (see **7.2 Methodological Implications),** language instruction, language activation and use, etc.). If we follow this line of reasoning, our data suggest support for models of L3 morphosyntactic transfer arguing for property-by-property transfer or hybrid transfer, that is, transfer of individual linguistic properties, instead of wholesale transfer, that is, transfer of one grammar (L1 or L2) as a block (Puig-Mayenco et al., 2020; Schwartz & Sprouse, 2021; see **2.2 Models of L3 Morphosyntactic Transfer**). This is further supported by the fact that we were not able to replicate the results in different linguistic properties (superlatives and two-verb clusters) in the self-paced reading task and sentence completion task (see **Table 31**). Thus, we can answer our second sub-question: Different linguistic properties (superlatives and two-verb clusters) are affected differently in our studies on morphosyntactic transfer into the L3 (SQ.2). Wholesale transfer would imply that we should expect the same transfer patterns for

superlatives and two-verb clusters in both groups of learners of L3 Dutch. This is not what we find in our data.

The Linguistic Proximity Model and the Scalpel Model both predict transfer from both the L1 and the L2 based on the proximity of particular properties, that is, structural proximity, between the languages at hand, rather than general typological proximity (Westergaard et al., 2017; Slabakova, 2017; Westergaard 2021a, 2021b). When processing a particular property in the L3, the corresponding properties in both the L1 and L2 are activated and compete with each other for structural proximity and the property with the higher degree of similarity is transferred into the L3. In addition, the Scalpel Model assumes that additional factors besides structural proximity influence L3 morphosyntactic transfer. These are factors such as construction frequency in the target L3, availability of clear unambiguous input, prevalent use and processing complexity. Since in our study both the L1 property and the L2 property are available in the L3, we have to assume that the L1 and the L2 are activated to the same degree. If structural proximity was the sole factor in L3 morphosyntactic transfer, logically we should find approximately a fifty-fifty distribution between the two conditions for the superlative and two-verb clusters in our data, since this is a binary choice between the respective conditions, activated both through German and English. We find this in both groups of learners of L3 Dutch for the results of the grammaticality judgement task, and also in German-speaking learners of L3 Dutch regarding the two-verb clusters in both the self-paced reading task and the sentence completion task. Both groups of learners of L3 Dutch judge the morphological superlative and the syntactic superlative, as well as Participle-Auxiliary and Auxiliary-Participle grammatical to the same extent and at the same speed in the grammaticality judgement task. Furthermore, German speaking learners of L3 Dutch show no significant difference between Participle-Auxiliary and Auxiliary-Participle in both the self-paced reading task and the sentence completion task. When in fact both the L1 and the L2 are equally available for morphosyntactic transfer into the L3 due to the same degree of activation of the L1 and L2, this suggests support for the Linguistic Proximity Model. However, while it might be that in German-speaking learners of L3 Dutch both the L1 German and the L2 English are activated to similar degrees due to the fact that English is a lingua franca, especially in the university students we tested in our experiments, we argue that in English-speaking learners of L3 Dutch only their L1 English is highly activated. Their L2 German is not a lingua franca, at least not with regard to the participants we tested in our experiment, and we can assume that it plays a minor

role outside the foreign language classroom. This suggests that our data cannot be explained by the Linguistic Proximity Model alone and additional factors as proposed by the Scalpel Model might account for our results.

For the results on superlatives of both the self-paced reading task and the sentence completion task, we argue that our data might suggest evidence for the Typological Primacy Model since both groups of learners of L3 Dutch seem to select the typologically closer language, German, as the source of morphosyntactic transfer into L3 Dutch. However, the pattern observed in German-speaking and English-speaking learners of L3 Dutch might equally be explained by additional factors of morphosyntactic transfer in L3 acquisition. One of those factors might be the construction frequency of the morphological superlative and the syntactical superlative in Dutch (Slabakova, 2017), which learners of L3 Dutch encounter through both spoken and written input. In Dutch, the morphological superlative (~ 90 %) is used much more frequently than the syntactical superlative (~ 10 %) (Karsdorp & Beekhuizen, 2010; Kiers, 2014). Therefore, both groups of learners of L3 Dutch are exposed with greater frequency to the morphological superlative compared to the syntactic superlative in L3 Dutch. Moreover, we argue that the morphological superlative is encountered more frequently than the syntactical superlative in early stages of learning Dutch as a foreign language. High-frequency monosyllabic and disyllabic adjectives are introduced earlier in the language learning process than trisyllabic and polysyllabic adjectives, and usually take the morphological superlative (see, e.g., De Boer et al., 2019; Verbruggen & Tamse, 2019). This might lead to the fact that both groups of learners of L3 Dutch prefer the high-frequency morphological superlative over the low-frequency syntactic superlative. Another factor explaining our data, and probably going hand in hand with construction frequency in the target L3, might be the overall construction frequency of the morphological superlative and the syntactical superlative in both German and English. In German, the morphological superlative is the default for all adjectives (monosyllabic, disyllabic, trisyllabic and polysyllabic) (Eisenberg, 2020). In English, on the other hand, the syntactic superlative is the default only for trisyllabic and polysyllabic adjectives (Bauer et al., 2013). For disyllabic adjectives both the morphological superlative and the syntactic superlative are possible, and for monosyllabic adjectives typically only the morphological superlative is grammatical (Bauer et al., 2013). English and Dutch have essentially the same patterns of use for the two forms of superlative. Thus, whereas in German, there is only the morphological superlative, in English there are both the morphological

superlative and the syntactic superlative. The fact that the morphological superlative is available in both German and English, and activated to the same degree in both groups of learners of L3 Dutch, might explain the more frequent production of the morphological superlative compared to the syntactic superlative.

This reasoning is supported by the results of the English-speaking learners of L2 Dutch. We would expect, that English-speaking learners of L2 Dutch would show a preference for the syntactic superlative, as they lack knowledge of German, and the syntactic superlative is the only available form in their L1 English for trisyllabic and polysyllabic adjectives. However, we find that English-speaking learners of L2 Dutch, like German-speaking and English-speaking learners of L3 Dutch, show a preference for the morphological superlative in both the self-paced reading task and the sentence completion task, through the same reasoning as was applied with regard to German-speaking and English-speaking learners of L3 Dutch (see **5.4.1 Superlatives** and **6.4.1 Superlatives**). The fact that English-speaking learners of L2 Dutch mirror the pattern of both groups of learners of L3 Dutch seems counter-intuitive. However, construction frequency of the morphological superlative and the syntactical superlative in both L2 Dutch and L1 English, and language instruction might explain the preference of the morphological superlative in English-speaking learners of Dutch, too.

Thus, additional factors such as construction frequency in the L3 (Slabakova, 2017) and language instruction might equally account for our data on the processing and comprehension, and production of superlatives. In that case, our data would neither support the Typological Primacy Model nor the L2 Status Factor Hypothesis.

For the results on two-verb clusters of both the self-paced reading task and the sentence completion task, we argue that neither the Typological Primacy Model nor the L2 Status Factor Hypothesis can explain our data. However, the pattern observed in German-speaking and English-speaking learners of L3 Dutch might be explained by additional factors of morphosyntactic transfer in L3 acquisition. One of those factors might be the construction frequency in L3 Dutch, as already argued with regard to the superlative results. In German-speaking learners of L3 Dutch construction frequency in L3 Dutch might explain the transfer pattern observed. Both Participle-Auxiliary and Auxiliary-Participle are very frequent in Dutch and encountered by learners of L3 Dutch to the same extent through both spoken and written input. Moreover, we argue that both Participle-Auxiliary and Auxiliary-Participle are encountered to the same extent in early stages of learning Dutch as a

foreign language. This might lead to the fact that learners of L3 Dutch with L1 German show no difference in their preference for Participle-Auxiliary and Auxiliary-Participle in both the self-paced reading task and the sentence completion task. However, construction frequency in L3 Dutch alone cannot explain our data, since we do not see the same pattern in English-speaking learners of L3 Dutch. Thus, other factors might play a role or interact with construction frequency in L3. One of those factors might be the difference in holistic proficiency (i.e., general proficiency) and/or analytical proficiency (i.e., proficiency in relation to a specific grammatical property) in L2 and L3 between German-speaking and English-speaking learners of L3 Dutch (Bardel & Sánchez, 2020; Angelovska et al., 2023; Eibensteiner, 2023; see **2.2.7 Discussion of Models of L3 Morphosyntactic Transfer**). Even though we treat the LexTALE-scores with care, English-speaking learners of L3 Dutch have significantly lower LexTALE-scores in their L2 German (65.72%) than German-speaking learners of L3 Dutch in their L2 English (73.18%). Although it has been shown that transfer from the L2 into the L3 occurs, even when L2 proficiency is low or intermediate (e.g., Flynn et al., 2004; Sánchez, 2020), it is argued that transfer from the L2 into the L3 seems to be more likely with higher L2 proficiency (e.g., Williams & Hammarberg, 1998; Jarvis & Pavlenko, 2008; Bardel & Sánchez, 2020). Moreover, it is argued that grammatical properties must be well internalised or even automatised in the L2 in order to be transferred from the L2 into the L3 (Ringbom & Jarvis, 2009; see also Lindqvist, 2019). English-speaking learners of L3 Dutch might not show morphosyntactic transfer from their L2 German, that is, the language typologically closer to Dutch, into L3 Dutch, due to lower general proficiency in their L2 German. Regardless of holistic L2 proficiency, it might also be the case that they have not yet internalised or automatised Participle-Auxiliary, that is, the German form, in their L2 German. If this is indeed the case, it is less likely that they will transfer Participle-Auxiliary from their L2 German into L3 Dutch (Ringbom & Jarvis, 2009; see also Lindqvist, 2019), which we find in our data. Moreover, L3 proficiency could explain the difference between German-speaking (67.18%) and English-speaking (63.57%) learners of L3 Dutch. It might be the case that, due to significantly lower L3 proficiency, English-speaking learners of L3 Dutch, in contrast to German-speaking learners of L3 Dutch, have not yet learned that the two-verb clusters used in our study can be formed as both Participle-Auxiliary and Auxiliary-Participle in Dutch. This is also reflected in the relatively high percentages of incorrect answers for Participle-Auxiliary (27.78%) compared to Auxiliary-Participle (13.83%) to the

grammaticality judgement task (see **Table 17**). This reasoning is supported by the results of the English-speaking learners of L2 Dutch, who show the same pattern as English-speaking learners of L3 Dutch, which we would expect since Auxiliary-Participle is the only available form in their L1. However, they, too, have significantly lower proficiency in Dutch (61.56%), and the fact that they might not yet have learned that Participle-Auxiliary and Auxiliary-Participle are both grammatical in Dutch is well reflected in the relatively high percentages of incorrect answers for Participle-Auxiliary (25.00%) compared to Auxiliary-Participle (5.56%) in the grammaticality judgement task (see **Table 17**). Regarding the influence of language proficiency in the L3 and the L2 on morphosyntactic transfer into the L3, we find an effect of language proficiency in L3 Dutch only in the results of the grammaticality judgement scores for two-verb clusters. LexTALE scores for Dutch significantly predicted acceptance rates for two-verb clusters across all groups of learners of Dutch, suggesting that higher proficiency in Dutch correlated with higher acceptance of both forms, though the effect was relatively small. Other than that, we find no effect of L2 and L3 language proficiency in our data. Thus, we can answer our fourth sub-question: Overall, there is no evidence in our data that morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2 (SQ.4). For a critical discussion of LexTALE see Puig-Mayenco et al. (2023) and the methodological discussion in this dissertation (see **7.2 Methodological Implications).**

Another possible additional factor accounting for our data might be language activation and use (Slabakova, 2017), which is also in line with Fallah et al. (2016), Fallah and Jabbari (2018), and Jabbari et al. (2018), who claim that the dominant language of communication might be the main source of morphosyntactic transfer into the L3. In English-speaking learners of L3 Dutch, English is the most dominant language. In the context where we tested our participants, their L2 German is not a lingua franca, and we can assume that both L2 German and L3 Dutch play a minor role outside the foreign language classroom. On the other hand, in German-speaking learners of L3 Dutch, German is the most dominant language. However, their L2 English is a lingua franca, especially in the context where we tested our participants, and we can assume that their L2 English plays a bigger role outside the foreign language classroom, as opposed to their L3 Dutch. This is also reflected in the proficiency scores for the respective L2 of both groups of learners of L3 Dutch (see above). From this we conclude that German-speaking learners of L3 Dutch have a highly activated L2, namely English, next to a dominant and highly

activated L1, namely German, whereas English-speaking learners of L3 Dutch only have one dominant and highly activated language, namely English. Thus, we argue that both German and English are highly activated and used on an almost daily basis in German-speaking learners of L3 Dutch which might contribute to both L1 and L2 transfer in this group of learners. Furthermore, we argue that only English is highly activated and used on a daily basis in English-speaking learners of L3 Dutch which might contribute to dominant L1 transfer in this group of learners. This reasoning is again supported by the results of the English-speaking learners of L2 Dutch, who show the same pattern as English-speaking learners of L3 Dutch, which we would expect since Auxiliary- Participle is the only available form in their L1. Since they have no knowledge of German, their L1 English is the most dominant language, and we can assume that L2 Dutch plays a minor role outside the foreign language classroom. We argue that only English is highly activated and used on a daily basis in English-speaking learners of L2 Dutch which might contribute to dominant L1 transfer in this group of learners. Thus, factors such as language proficiency and language activation and use might explain the difference between German-speaking and English-speaking learners of L3 Dutch, which suggests no evidence for either the Typological Primacy Model or the L2 Status Factor Hypothesis.

If we follow this line of reasoning, the question arises as to why both groups of English-speaking learners of Dutch seem to show a preference for the morphological superlative but not for Participle-Auxiliary, which are both the German forms. We argue that English-speaking learners of Dutch might have encountered the morphological superlative more frequently than the syntactic superlative through both spoken and written input of Dutch, as well as through language teaching (see above). Additionally, we argue that they have likely encountered Participle-Auxiliary frequently, too, especially in spoken Dutch and also in language teaching (see above). However, they might not yet have learned that Participle-Auxiliary is also grammatical in Dutch (see also **Table 15** and **Table 17**). It might be that, due to the fact that there is a difference in frequency between the morphological superlative (~ 90%) and syntactic superlative (~ 10%), but not between Participle-Auxiliary and Auxiliary-Participle, which are equally frequent in Dutch, considering spoken and written language, the morphological superlative stands out to learners of Dutch but Participle-Auxiliary does not. As a result, English-speaking learners of Dutch have learned that the morphological superlative is grammatical in Dutch, but not yet that Participle-Auxiliary is also grammatical

in Dutch. Furthermore, English has both the morphological superlative and the syntactic superlative, but only Auxiliary-Participle, not Participle-Auxiliary, which is why English-speaking learners of Dutch are familiar with the morphological superlative from their L1 but not Participle-Auxiliary. These differences in construction frequency in the target L3 and the overall construction frequency might explain the differences observed in the results on superlatives and two-verb clusters in English-speaking learners of Dutch.

In summary, while the factor *typological proximity* might play an important role in morphosyntactic transfer into the L3 and our data can partially be explained by the Typological Primacy Model, additional factors of morphosyntactic transfer in L3 acquisition such as construction frequency in the L3, language instruction, L2 and L3 proficiency, and language activation and use can equally explain the patterns observed in our data. This becomes particularly evident when comparing the results of the learners of L3 Dutch to those of English-speaking learners of L2 Dutch. Therefore, we conclude that our data cannot be solely explained by either the L2 Status Factor Hypothesis or the Typological Primacy Model. Various factors might interact in morphosyntactic transfer in L3 acquisition, depending on the specific language constellations under investigation, and it might not be feasible to isolate one single determining factor (Lindqvist, 2019). This points in the direction of the Scalpel Model, supporting the concept of property-by-property transfer or hybrid transfer rather than wholesale transfer (Slabakova, 2017). Finally, we have "to acknowledge that we are still in the early stages of understanding the complexities of … L3 acquisition" (González Alonso & Rothman, 2017, p. 293).

7.2 Methodological Implications

The strength of this dissertation is its complex methodology, which incorporates multiple methods and complex data analyses. The aim was to achieve a broad overview of morphosyntactic transfer from German and English, respectively, into L3 Dutch. As recommended in the literature (Puig-Mayenco et al., 2020), we used a mirror-image methodology to investigate morphosyntactic transfer between the closely related languages Dutch, German and English, testing German-speaking and English-speaking learners of L3 Dutch. In addition, we also tested L1 speakers of Dutch and English-speaking learners of L2 Dutch, contributing to the interpretation of our data. To our knowledge, this approach has not been undertaken before, and we strongly advocate for its consideration in future research on

morphosyntactic transfer between Dutch, German and English. Furthermore, we used more than one linguistic property (superlatives and two-verb clusters) and more than one research method, namely a grammaticality judgement task, a self-paced reading task, and a sentence production task. The use of multiple linguistic properties and research methods contributes to a wide-ranging overview on morphosyntactic transfer into the L3, and allowed us to investigate morphosyntactic transfer between Dutch, German and English across both language processing and comprehension, and language production. By employing different methods, we achieved a comprehensive and nuanced investigation of morphosyntactic transfer between Dutch, German, and English in both language processing and comprehension, as well as language production, yielding an insightful understanding of the phenomenon under study. We strongly recommend that future research continues to use such a multifaceted approach to deepen and expand our understanding of morphosyntactic transfer from German and/or English into L3 Dutch.

However, the methodology used might have had an impact on the overall results of this dissertation, and discussing this effect provides valuable implications for future research. Although we advocate for the use of different methods in investigating morphosyntactic transfer into the L3, the results might have been influenced by the choice of specific tasks used in the processing and comprehension study as well as in the production study. There is no difference in the preference patterns for the superlatives and two-verb clusters of German-speaking and English-speaking learners of L3 Dutch in either the self-paced reading task or the sentence completion task. However, there is a difference between the results of the grammaticality judgement task, on the one hand, and the results of the self-paced reading task and the sentence completion task, on the other (see **Table 31**). It might be that the grammaticality judgement task, though timed, taps into explicit knowledge by allowing participants to access their metalinguistic knowledge, leading them to consider both their L1 and L2 for transfer into the L3 (see also Angelovska et al., 2023). In contrast, the self-paced reading task and the sentence completion task are more likely to reflect implicit knowledge, which might explain the preference for either the L1 or the L2 depending on the typological proximity between German, English and Dutch, or additional factors of morphosyntactic transfer in L3 acquisition. Participants might employ different strategies depending on the task. When explicitly asked to judge the grammaticality of Dutch sentences in the grammaticality judgement task, participants might be more conscious of the

grammatical options available in L3 Dutch, drawing from both their L1 and L2. In the less monitored self-paced reading task and sentence completion task, participants might be less conscious and show authentic instances of morphosyntactic transfer into L3 Dutch.

Furthermore, the specific properties under investigation—superlatives and two-verb clusters—might have influenced the results of testing for morphosyntactic transfer into the L3. Both the German and the English forms of these properties are grammatical in Dutch. This allows for observations of transfer patterns from the L1 and/or the L2 into the L3, since the possibility of learners of L3 Dutch avoiding either the German form or the English form due to its ungrammaticality in Dutch is for this reason excluded. However, the grammaticality of both the German form and the English form in L3 Dutch makes it difficult to differentiate between instances of morphosyntactic transfer into the L3 and instances of language learning—especially in learners of L3 Dutch beyond the initial state and with high levels of language proficiency (see below). Using linguistic properties where one form, either the German or the English form, is grammatical and the other form is ungrammatical in L3 Dutch offers a viable methodological option that could further enhance our understanding of transfer from German and/or English into L3 Dutch. This approach is often used in the literature on morphosyntactic transfer into the L3. If both German-speaking and English-speaking learners of L3 Dutch prefer the German form regardless of grammaticality, this would support the Typological Primacy Model and represent evidence against the L2 Status Factor Hypothesis. If, on the other hand, both German-speaking and English-speaking learners of L3 Dutch prefer the form from their respective L2s regardless of grammaticality, this would provide evidence for the L2 Status Factor Hypothesis and against the Typological Primacy Model. This highlights the importance of a mirror-image methodology (Puig-Mayenco et al., 2020). Only through such a methodology it is possible to test effectively between the L2 Status Factor Hypothesis and the Typological Primacy Model. For example, if we test only English-speaking learners of L3 Dutch and they prefer the German form, that is, the form from their L2, this would support both the L2 Status Factor Hypothesis and the Typological Primacy Model. Similarly, if we test only German-speaking learners of L3 Dutch and they prefer the German form, that is, the form from their L1, this would support both default L1 transfer and the Typological Primacy Model. To better differentiate between instances of morphosyntactic transfer into the L3 and instances of language learning, combining the aforementioned approach with linguistic

properties introduced later in the language learning process or not explicitly taught at all might also be beneficial. Superlatives and two-verb clusters are introduced early in the language learning process, and participants might already be familiar with them, as reflected in the results of the grammaticality judgement task scores. Both German-speaking and English-speaking learners of L3 Dutch judge the morphological superlative and the syntactic superlative, as well as Participle-Auxiliary and Auxiliary-Participle to be equally grammatical. Investigating linguistic properties that differ in grammaticality in either German or English, and Dutch, and are not explicitly taught in the L3 Dutch classroom, might provide an interesting line of further research. Additionally, investigating linguistic properties that are not explicitly taught in the L3 Dutch classroom might allow for the identification of authentic instances of morphosyntactic transfer into L3 Dutch even through a grammaticality judgement task.

Moreover, the results of this dissertation might have been influenced by the participants tested to investigate morphosyntactic transfer into L3 Dutch. The German-speaking and English-speaking learners of L3 Dutch in our study included both those at the initial state and those beyond the initial state of L3 acquisition. This decision was made for pragmatic reasons, as learners of L3 Dutch are particularly hard to find, especially in the English language area. Although it is argued that all the models of L3 morphosyntactic transfer aim to explain and predict transfer into the L3 throughout L3 development (Rothman, 2011; Angelovska & Hahn, 2017; Puig-Mayenco et al., 2020), González Alonso and Rothman (2017), and Cabrelli and Puig-Mayenco (2021) argue that at later stages of L3 acquisition, it can be challenging, if not impossible, to isolate transfer into the L3 from L3 acquisition. This might also be true for our data and is supported by the fact that our data suggests individual variation across all tasks. Testing participants beyond the initial state involves participants with higher L3 proficiency, and it is argued that transfer in general is more likely to occur at lower levels of L3 proficiency (e.g., Williams & Hammarberg, 1998; De Angelis, 2007; Eibensteiner, 2023). Again, this might also be true for our data. We accounted for the factor *L3 proficiency*—and also *L2 proficiency*—in the statistical models used in this dissertation (see **5.3 Results** and **6.3 Results**). However, we found no evidence in our data that morphosyntactic transfer into the L3 is influenced by L2 or L3 language proficiency. In this dissertation, we use LexTALE scores for L3 Dutch and L2 English and German, but we are cautious about drawing conclusions. We are reluctant to conclude that proficiency in L3 and L2 has no effect on

morphosyntactic transfer into the L3. According to Puig-Mayenco et al. (2023), LexTALE might be able to measure vocabulary knowledge, but is not reliable as a measure of global proficiency, especially in intermediate learners, that is, levels B1 to B2 of the Common European Framework of Reference for Languages (Puig-Mayenco et al., 2023). We can assume that participants in our study are upper intermediate learners of L3 Dutch and L2 English and German, respectively, which corresponds with level B2 of the Common European Framework of Reference for Languages (Lemhöfer & Broersma, 2012). LexTALE has been widely used to measure language proficiency at various levels of language proficiency since its publication (Puig-Mayenco et al., 2023) and was a reasonable choice when designing this study. We use the vocabulary measure, which LextTALE in essence is, as a proxy for proficiency, knowing full well that is not very precise. To our knowledge, apart from Puig-Mayenco et al. (2023), only Nakata et al., (2020) have examined the validity of LexTALE. They argue that LexTALE is a good measure of vocabulary knowledge and to a lesser extent of proficiency. In future research, it might therefore be effective to use a tool not only measuring general language proficiency but also being able to measure language proficiency at different levels of language proficiency. Moreover, it might be useful to test participants at the initial state of L3 acquisition, although, the question remains whether this is feasible regarding English-speaking learners of L3 Dutch.

7.3 Pedagogical Implications

The results of this dissertation have consequences for learning and teaching Dutch as an L3 in the German and English language areas. Based on the results of our study on the perception of German-speaking and English-speaking learners of L3 Dutch of the typological proximity between Dutch, German and English, we can assume that in both German-speaking and English-speaking learners of Dutch, German is the language that has the stronger influence (positive and negative) on L3 Dutch. For German-speaking learners of L3 Dutch, German is the L1, and for English-speaking learners of L3 Dutch, German is the L2. In both the self-paced reading task and the sentence completion task, both groups of learners of L3 Dutch seemed to select the typologically closer language, German, as the source of morphosyntactic transfer into L3 Dutch for superlatives. If we argue that typological proximity indeed plays an important role in morphosyntactic transfer into the L3, German should play a central role in learning Dutch as an L3 by these

two groups of learners—especially when it comes to promoting positive transfer. However, we argue that both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, and that the preference for one language over the other can be equally explained by additional factors such as construction frequency in the L3, language instruction, L2 and L3 proficiency, and language activation and use. If indeed both the L1 and the L2 are equally available for morphosyntactic transfer into the L3, the acquisition of L3 Dutch in the German and English language areas can benefit from including both German and English in the L3 Dutch classroom. This is contrary to the principle of functional monolingualism in the L3 Dutch classroom and in favour of contrastive linguistic analyses of Dutch, German and English, as recommended in reference books (Braam & Wenzel, 2014; Reitsma, 2016) and core curricula for Dutch as a foreign language in Lower Saxony and North Rhine-Westphalia (MSB, 2014; MK, 2017b; MSB, 2020). This would allow learners to better assess whether Dutch, German and English share certain forms of linguistic properties or not. It is argued that especially in learning closely related languages, language teachers should systematically emphasise similarities and differences between the languages in question (Bardel, 2019), which is also in line with the model of pedagogical translanguaging (Cenoz & Gorter, 2014, 2020). According to Cenoz and Gorter (2021, 2023) the whole multilingual repertoire of language learners should be activated during the language learning process, and elements of language learners' different languages should be compared at different linguistic levels (e.g., lexical, syntax, morphology) in order to use transfer as a conscious and intentional strategy in the multilingual classroom. Language teachers should highlight similarities and differences between languages by creating classroom activities that enhance language learners' metalinguistic awareness (Cenoz & Gorter, 2011). To achieve this, teachers of L3 Dutch would benefit from having basic knowledge of the grammars of German and English, as well. We argue that this is not at all uncommon for teachers of L3 Dutch in the German and English language areas (see **2.3.1 Dutch in the German and English Language Areas**). However, although knowledge of both German and English is available, it seems, for example, that teachers of L3 Dutch in the German language area rarely include German and English in the L3 Dutch classroom and adhere instead to the principle of functional monolingualism (e.g., Urbanek, 2022). Therefore, future teachers of L3 Dutch might benefit from education on topics such as *(morphosyntactic) transfer*, *translanguaging*, and *interventions to enhance metalinguistic knowledge* in their

teacher training programs. In addition, practicing teachers of L3 Dutch might benefit from receiving further training on these topics. Furthermore, the provision of teaching materials that aim at highlighting the similarities and differences between Dutch, German and English, and enhance language learners' metalinguistic awareness, can encourage teachers of L3 Dutch to include both German and English in their L3 Dutch classrooms. In this way, teachers and learners can use morphosyntactic transfer as a conscious and intentional strategy in the L3 Dutch classroom.

Next to explicit comparisons of the grammars of Dutch, German and English, learners of L3 Dutch might benefit from authentic input, both spoken and written. More specifically, regarding the linguistic properties under investigation, teachers of L3 Dutch might want to provide input including both forms of superlatives and two-verb clusters. We argue that construction frequency in the L3 might explain our results on the superlatives in both German-speaking and English-speaking learners of L3 Dutch. Providing input including both the morphological and syntactic superlative, that is, including superlatives of monosyllabic, disyllabic, trisyllabic and polysyllabic adjectives, early in the language learning process might not only lead language learners of L3 Dutch to realise that both forms of the superlative are grammatical in Dutch, but also make them aware of the fact that adjectives with three or more syllables prefer the syntactic superlative. Moreover, language learners of L3 Dutch can benefit from enhanced language proficiency in the L2 (English/German) and L3 Dutch. We find that English-speaking learners of L3 Dutch have significantly lower L2 proficiency (German) than German-speaking learners of L3 Dutch (English), and we argue that they might not show morphosyntactic transfer from their L2 German into L3 Dutch in our data on two-verb clusters, due to lower general proficiency in their L2 German. We also argue that it might be the case that they have not yet internalised or automatised Participle-Auxiliary, that is, the German form, in their L2 German. Furthermore, we argue that it might be the case that, due to significantly lower L3 proficiency, English-speaking learners of L3 Dutch, in contrast with German-speaking learners of L3 Dutch, have not yet recognised that the two-verb clusters used in our study can be formed with both Participle-Auxiliary and Auxiliary-Participle in Dutch. Enhanced language proficiency in the L2 (German) and L3 Dutch might lead English-speaking learners of L3 Dutch to realise that both forms of two-verb clusters are grammatical in Dutch. These examples illustrate the importance of authentic input and proficiency in the L2 and the L3 in the Dutch L3 classrooms.

In summary, the results of this dissertation suggest that both German and English should play a central role in the L3 Dutch classroom. Furthermore, learners of L3 Dutch might benefit from teachers of Dutch who have the competencies to teach Dutch in a way that includes and contrasts their whole language repertoire, or at least their German and English. Raising the awareness of teachers of L3 Dutch about the mechanisms of morphosyntactic transfer and the possible factors involved (see above) can help them to recognise the influence of German and English as well as additional factors influencing (individual) language learning trajectories in the L3 Dutch classroom, and to develop language activities that use morphosyntactic transfer as a conscious and intentional strategy. Finally, learning L3 Dutch might benefit from enhancing metalinguistic knowledge and proficiency both in the L2 (English/German) and in the L3 Dutch of the learners.

7.4 Conclusion

The main goal of this dissertation was to test the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011) against the Typological Primacy Model (Rothman, 2011, 2015). Based on the results of the studies on the processing and comprehension, and production of Dutch superlatives and two-verb clusters in German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch, we can answer the overarching research question of this dissertation:

(RQ) Which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition?

While the Typological Primacy Model might explain parts of our data, we find that typological proximity it is not the only explanatory factor in morphosyntactic transfer into the L3. Consequently, neither the Typological Primacy Model nor the L2 Status Factor Hypothesis, best predicts our data on morphosyntactic transfer between the closely related languages German, English and Dutch in L3 acquisition. We have shown that additional factors, such as construction frequency in the L3, language instruction, L2 and L3 proficiency, and language activation and use, can equally explain the patterns observed in our data. This points towards the

Scalpel Model and supports the concept of property-by-property transfer or hybrid transfer rather than wholesale transfer.

Furthermore, we can answer the sub-questions of this dissertation. In the study on the perception of the typological proximity between Dutch, German and English, we find that German-speaking and English-speaking learners of L3 Dutch perceive German as closer to Dutch than English is to Dutch, and that this perception is based on the factor *vocabulary* (SQ.1). Moreover, although we were able to replicate the results of morphosyntactic transfer into L3 Dutch in different linguistic properties (superlatives and two-verb clusters) in the grammaticality judgement task, we were not able to replicate these results in the self-paced reading task and sentence completion task (SQ.2). In addition, we found no differences in L3 morphosyntactic transfer between language processing and language production tasks. However, there is a difference between the grammaticality judgement task, on the one hand, and the self-paced reading task and the sentence completion task, on the other (SQ.3). Finally, we found no evidence in our data that morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2 (SQ.4).

In summary, it seems that morphosyntactic transfer into the L3 is not determined by one single factor. Different factors might account for different results on morphosyntactic transfer into the L3 and interact with each other depending on the language combination under investigation. This might be especially true if the L1 and L2 are both closely related to the L3. However, the methodology used might have had an impact on the overall results of this dissertation. Nevertheless, the results suggest that both German and English should play a central role in the L3 Dutch classroom. Finally, “the search for the definitive L3 acquisition account continues!” (Slabakova, 2017, p. 12).

REFERENCES

Angelovska, T., & Hahn, A. (2017). L3 syntactic transfer: An integrative approach. In T. Angelovska & A. Hahn (Eds.), *L3 syntactic transfer: Models, new developments and implications* (pp. 1-9). John Benjamins. https://doi.org/10.1075/bpa.5.01ang

Angelovska, T., & Hahn, A. (2023). Third Language Acquisition in the Classroom. In J. Cabrelli, A. Chaouch-Orozco, J. González Alonso, S. M. Pereira Soares, E. Puig-Mayenco & J. Rothman (Eds.), *The Cambridge Handbook of Third Language Acquisition* (pp. 466-491). Cambridge University Press. https://doi.org/10.1017/9781108957823.019

Angelovska, T., Roehm, D., & Weinmüller, S. (2023). Uncovering transfer effects of dominance and proficiency in L3 English acquisition using the visual moving window paradigm and grammaticality judgments [*sic*]. *Applied Linguistics Review*, *14*(1), 115-143. https://doi.org/10.1515/applirev-2019-0075

Arfs, M. (2007). *Rood of groen? De interne woordvolgorde in tweeledige werkwoordelijke eindgroepen met een voltooid deelwoord en een hulpwerkwoord in bijzinnen* [Doctoral dissertation, University of Gothenburg]. Doctoral Theses from University of Gothenburg. http://hdl.handle.net/2077/17039

Aronin, L., & Jessner, U. (2015). Understanding current multilingualism: What can the butterfly tell us?. In U. Jessner & C. Kramsch (Eds.), *The multilingual challenge: Cross-Disciplinary perspectives* (pp. 271-291). De Gruyter. https://doi.org/10.1515/9781614512165-013

Association for Low Country Studies (ALCS) (2006). *Lying low: Low countries studies in Great Britain and Ireland in the early twenty-first century*. University of Sheffield. Retrieved March 20, 2024, from https://drive.google.com/file/d/1DlfNHgoqgtx0nG2eebNWDHyWt9TCmLux/view

Association for Low Country Studies (ALCS) (2018). *The state of Dutch studies in the UK and Ireland: A study into the provision of Dutch language and culture teaching in higher education, 2017-18*. University of Sheffield. Retrieved March 20, 2024, from https://drive.google.com/file/d/1EpUeKfTeYoC7tnxhnV7tUkoLX-BRxXCv/view

Audring, Jenny. (2015, December). Adjectival inflection. *Taalportaal*. Retrieved March 20, 2024, from https://taalportaal.org/taalportaal/topic/pid/topic-13998813296919801

Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of memory and language*, *59*(4), 390-412. https://doi.org/10.1016/j.jml.2007.12.005

Bader, M., & Schmid, T. (2009). Verb clusters in colloquial German. *The Journal of Comparative Germanic Linguistics*, *12*, 175-228. https://doi.org/10.1007/s10828-009-9032-x

Baker, C. (2001). *Foundations of bilingual education and bilingualism*. Multilingual Matters.

Baker, C. (2016) The Effects of the Norman Conquest on the English Language. *Tenor of Our Times*, *5*(5), 41-47.

Ballinger, S., Lau, S. M. C., & Quevillon Casse, C. (2020). Cross-linguistic pedagogy: Harnessing transfer in the classroom. *The Canadian Modern Language Review / La revue canadienne des langues vivantes*, *76*(4), 265-277. https://doi.org/10.3138/cmlr-76.4.001-en

Barbiers, S., Bennis, H., De Vogelaer, G., van der Auwera, J., & van der Ham, M. (2008). *Syntactic Atlas of Dutch Dialects (SAND). Part II: Auxiliaries, verb clusters and negation*. Amsterdam University Press.

Bardel, C. (2019). Syntactic Transfer in L3 Learning. What Do Models and Results Tell Us About Learning and Teaching a Third Language?. In M. Gutierrez-Mangado, M. Martínez-Adrián & F. Gallardo-del-Puerto (Eds.), *Cross-Linguistic Influence: From Empirical Evidence to*

Classroom Practice. Second Language Learning and Teaching. Springer. https://doi.org/10.1007/978-3-030-22066-2_6
Bardel, C., & Falk, Y. (2007). The role of the second language in third language acquisition: The case of Germanic syntax. *Second Language Research*, *23*(4), 459-484. http://www.jstor.org/stable/43103748
Bardel, C., & Falk, Y. (2012). The L2 status factor and the declarative/procedural distinction. In J. Cabrelli Amaro, S. Flynn & J. Rothman (Eds.), *Third language acquisition in adulthood*. (pp. 61-78.) John Benjamins. https://doi.org/10.1075/sibil.46.06bar
Bardel, C., & Falk, Y. (2021). L1, L2 and L3: Same or different? *Second Language Research, 37*(3), 459-464. https://doi.org/10.1177/0267658320941033
Bardel, C., & Sánchez, L. (2017). The L2 Status Factor hypothesis revisited: The role of metalinguistic knowledge, working memory, attention and noticing in third language learning. In T. Angelovska & A. Hahn (Eds.), *L3 syntactic transfer: Models, new developments and implications* (pp. 85-102). John Benjamins. https://doi.org/10.1075/bpa.5.05bar
Bardel, C., & Sánchez, L. (Eds.). (2020). *Third language acquisition. Age, proficiency and multilingualism*. Language Science Press. https://doi.org/10.5281/zenodo.4138753
Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of memory and language*, *68*(3), 255-278. https://doi.org/10.1016/j.jml.2012.11.001
Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1-48. https://doi.org/10.18637/jss.v067.i01
Bauer, L., Lieber, R., & Plag, I. (2013). *The Oxford reference guide to English morphology*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198747062.001.0001
Berkes, É., & Flynn, S. (2012). Further evidence in support of the Cumulative-Enhancement Model: CP structure development. In J. Cabrelli Amaro, S. Flynn & J. Rothman (Eds.), *Third language acquisition in adulthood* (pp. 143-164). John Benjamins. https://doi.org/10.1075/sibil.46.11ber
Berthele, R. (2019). Policy recommendations for language learning: Linguists' contributions between scholarly debates and pseudoscience. *Journal of the European Second Language Association*, *3*(1), 1-11. https://doi.org/10.22599/jesla.50
Bialystok, E. (2011). Reshaping the mind: The benefits of bilingualism. *Canadian Journal of Experimental Psychology*, *65*(4), 229-235. https://doi.org/10.1037/a0025406
Bloem, J., Versloot, A., & Weerman, F. (2017). Verbal cluster order and processing complexity. *Language Sciences*, *60*, 94-119. https://doi.org/10.1016/j.langsci.2016.10.009
Bonacina-Pugh, F., da Costa Cabral, I., & Huang, J. (2021). Translanguaging in education. *Language Teaching*, *54*(4), 439-471. https://doi.org/10.1017/S0261444821000173
Booij, G. E. (2019). *The morphology of Dutch* (2nd ed.). Oxford University Press. https://doi.org/10.1093/oso/9780198838852.001.0001
Bouma, G. (2015). N-gram Frequencies for Dutch Twitter Data. *Computational Linguistics in the Netherlands Journal*, *5*, 25-36.
Box, G. E. P., & Cox, D. R. (1964). An analysis of transformations. *Journal of the Royal Statistical Society: Series B (Methodological)*, *26*(2), 211-243. https://doi.org/10.1111/j.2517-6161.1964.tb00553.x
Braam, M., & Wenzel, V. (2014). Funktional einsprachig unterrichten. Niederländisch sprechen und Niederländisch lernen. In V. Wenzel (Ed.), *Fachdidaktisch Niederländisch* (pp. 258-266). LIT Verlag.
British Council (2017). *Languages for the future: The foreign languages the United Kingdom needs to become a truly global nation*. Retrieved March 20, 2024, from https://www.britishcouncil.org/sites/default/files/languages_for_the_future_2017.pdf

Cabrelli, J., & Puig-Mayenco, E. (2021). Theoretical and methodological considerations for a robust evaluation of the Linguistic Proximity Model. *Second Language Research*, *37*(3), 465-471. https://doi.org/10.1177/0267658320943661

Cenoz, J. (2003). The additive effect of bilingualism on third language acquisition: A review. *International Journal of Bilingualism*, *7*(1), 71-87. https://doi.org/10.1177/13670069030070010501

Cenoz, J. & Gorter, D. (2011). Focus on multilingualism: A study of trilingual writing. *The Modern Language Journal*, *95*(3), 356-369. https://doi.org/10.1111/j.1540-4781.2011.01206.x

Cenoz, J., & Gorter, D. (2014). Focus on multilingualism as an approach in educational contexts. In A. Blackledge & A. Creese (Eds.), *Heteroglossia as practice and pedagogy: Educational linguistics* (pp. 239-254). Springer. https://doi.org/10.1007/978-94-007-7856-6_13

Cenoz, J., & Gorter, D. (2017). Minority languages and sustainable translanguaging: threat or opportunity? *Journal of Multilingual and Multicultural Development*, *38*(10), 901-912. https://doi.org/10.1080/01434632.2017.1284855

Cenoz, J., & Gorter, D. (2020). Teaching English through pedagogical translanguaging. *World Englishes*, *39*(2), 300-311. https://doi.org/10.1111/weng.12462

Cenoz, J., & Gorter, D. (2021). *Pedagogical translanguaging*. Cambridge University Press. https://doi.org/10.1017/9781009029384

Cenoz, J., & Gorter, D. (2023). Multilingualism at school and multilingual education. *International Encyclopedia of Education*, *4*(2), 188-194. https://doi.org/10.1016/B978-0-12-818630-5.08033-7

Chambers J. M., & Hastie T. J. (Eds.) (1992). *Statistical Models in S*. Wadsworth and Brooks/Cole. https://doi.org/10.1177/096228029200100208

Cheung, L., & Zhang, L. (2016). Determinants of the synthetic-analytic variation across English comparatives and superlatives. *English Language and Linguistics*. *20*(3), 559-583. https://doi.org/10.1017/S1360674316000368

Chomsky, N. (1981). Principles and parameters in syntactic theory. In N. Hornstein & D. Lightfoot (Eds.), *Explanation in linguistics: The logical problem of language acquisition* (pp. 32-75). Longman.

Chomsky, N. (2000). *The architecture of language*. Oxford University Press.

Coussé, E., Arfs, M., & De Sutter, G. (2008). Variabele werkwoordsvolgorde in de Nederlandse werkwoordelijke eindgroep: Een taalgebruiksgebaseerd perspectief op de synchronie en diachronie van de zgn. rode en groene woordvolgorde. In Rawoens, G. (Ed.), *Taal aan den lijve: Het gebruik van corpora in taalkundig onderzoek en taalonderwijs* (pp. 29-47). Academia Press.

Cummins, J. (2008). Teaching for transfer: Challenging the two solitudes assumptionin bilingual education. In N. H. Hornberger (Ed.), *Encyclopedia of language and education* (pp. 1528-1538). Springer. https://doi.org/10.1007/978-0-387-30424-3_116

Cummins, J. (2017). Teaching for transfer in multilingual schools. In O. García, A. Lin & S. May (Eds.), *Bilingual and multilingual education. Encyclopedia of language and education* (pp. 103-115). Springer. https://doi.org/10.1007/978-3-319-02258-1_8

De Angelis, G. (2007). *Third or Additional Language Acquisition*. Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781847690050

De Boer, B., Van der Kamp, M., & Lijmbach, B. (2019). *In de startblokken. Nederlands voor Duitstaligen*. Coutinho.

De Belder, M., & Hiemstra, A. (2023). Creating awareness of pluricentricity at university language departments: A case study of Dutch. In M. Callies & S. Hehner (Eds.), *Pluricentric languages and language education: Pedagogical implications and innovative approaches to language teaching* (pp. 132-174). Routledge. https://doi.org/10.4324/9781003248552-11

de Schutter, G., van den Berg, B., Goeman, T., & de Jong, T. (2005). *Morfologische Atlas van de Nederlandse Dialecten (MAND)*. Deel 1: *Meervoudsvorming bij zelfstandig naamwoorden,*

vorming van verkleinwoorden, geslacht bij zelfstandig naamwoord, bijvoeglijk naamwoord en bezittelijk voornaamwoord. Amsterdam University Press.

De Sutter, G. (2005). *Rood, groen, corpus! Een taalgebruiksgebaseerde analyse van woordvolgordevariatie in tweeledige werkwoordelijke eindgroepen* [Doctoral dissertation, Catholic University of Leuven]. LIRIAS. https://lirias.kuleuven.be/retrieve/65880

Dewulf, J. (2019). *The inspirational approach of Dutch Studies in the United States*. The Low Countries. Retrieved January 10, 2024, from https://www.the-low-countries.com/article/the-inspirational-approach-of-dutch-studies-in-the-united-states

Duarte, J., & Günther-van der Meij, M. (2018). A holistic model for multilingualism in education. *EuroAmerican Journal of Applied Linguistics and Languages*, *5*(2), 24-43. https://doi.org/10.21283/2376905X.9.153

Eberhard, D. M., Simons, G. F., & Fennig, C. D. (2024). *Ethnologue: Languages of the world*. Retrieved January 10, 2024, from http://www.ethnologue.com

Echarti, N., Huntemann, H., Lux, T., & Reichart, E. (2022). *Volkshochschul-Statistik: 59. Folge, Berichtsjahr 2020*. wbv Media GmbH & Company KG. https://www.die-bonn.de/doks/Volkshochschulstatistik/2022/2022-Volkshochschule-Statistik.pdf

EF Education First Ltd (2022). *The world's largest ranking of countries and regions by English skills*. Retrieved January 10, 2024, from https://www.ef.com/ca/epi/

Eibensteiner, L. (2023). L3 acquisition of aspect: the influence of structural similarity, analytic L2 and general L3 proficiency. *International Review of Applied Linguistics in Language Teaching*, *61*(4), 1827-1858. https://doi.org/10.1515/iral-2021-0220

Eisenberg, P. (2020). *Grundriss der Deutschen Grammatik: Das Wort*. J.B. Metzler. https://doi.org/10.1007/978-3-476-05096-0

Epstein, S., Flynn, S., & Martohardjono, G. (1996). Second language acquisition: Theoretical and experimental issues in contemporary research. *Behavioral and Brain Sciences*, *19*(4), 677-714. https://doi.org/10.1017/S0140525X00043521

Eubank, L. (1993/1994). On the transfer of parametric values in L2 development. *Language Acquisition*, *3*(3), 183-208. https://www.jstor.org/stable/20011400

Falk, Y., & Bardel, C. (2010). The study of the role of the background languages in third language acquisition. The state of the art. *International Review of Applied Linguistics in Language Teaching*, *48*(2). 185-219. https://doi.org/10.1515/iral.2010.009

Falk, Y., & Bardel, C. (2011). Object pronouns in German L3 syntax: Evidence for the L2 status factor. *Second Language Research*, *27*(1), 59-82. https://doi.org/10.1177/0267658310386647

Falk, Y., Lindqvist, C., & Bardel, C. (2015). The role of L1 explicit metalinguistic knowledge in L3 oral production at the initial state. *Bilingualism: Language and Cognition*, *18*(2), 227-235. https://doi:10.1017/S1366728913000552

Fallah, N., & Jabbari, A. A. (2018). L3 acquisition of English attributive adjectives: Dominant language of communication matters for syntactic cross-linguistic influence. *Linguistic Approaches to Bilingualism*, *8*(2), 193-216. https://doi.org/10.1075/lab.16003.fal

Fallah, N., Jabbari, A. A., & Fazilatfar, A. M. (2016). Source(s) of syntactic cross-linguistic influence (CLI): The case of L3 acquisition of English possessives by Mazandarani-Persian bilinguals. *Second Language Research*, *32*(2), 225-245. https://doi.org/10.1177/0267658315618009

Flynn, S. (1983). *A study of the effects of principal branching direction in second language acquisition: The generalization of a parameter of Universal Grammar from first to second language acquisition*. [Doctoral dissertation, Cornell University].

Flynn, S. (1987). *A parameter-setting model of L2 acquisition: Experimental studies in anaphora*. Reidel. https://doi.org/10.1007/978-94-009-3747-5

Flynn, S., Foley, C., & Vinnitskaya, I. (2004). The Cumulative-Enhancement Model for language acquisition: Comparing adults' and children's patterns of development in first, second and third language acquisition of relative clauses. *International Journal of Multilingualism*, *1*(1), 3-16. https://doi.org/10.1080/14790710408668175

Fuster, C. (2024). Lexical transfer as a resource in pedagogical translanguaging. *International Journal of Multilingualism*, *21*(1), 325-345. https://doi.org/10.1080/14790718.2022.2048836

Fuster, C., & Bardel, C. (2024). Translanguaging in Sweden: A critical review from an international perspective. *System*, *121*(103241), 1-23. https://doi.org/10.1016/j.system.2024.103241

Fuster, C., & Neuser, H. (2021). The role of morphological similarity in lexical activation and unintentional transfer. *International Journal of Bilingualism*, *25*(6), 1597-1615. https://doi.org/10.1177/13670069211031308

García Mayo, M. P., & Rothman, J. (2012). L3 morphosyntax in the generative tradition. In J. Cabrelli Amaro, S. Flynn & J. Rothman (Eds.), *Third language acquisition in adulthood* (pp. 9-32). John Benjamins. https://doi.org/10.1075/sibil.46.04pil

González Alonso, J., & Rothman, J. (2017). From theory to practice in multilingualism: What theoretical research implies for third language learning. In T. Angelovska & A. Hahn (Eds.), *L3 Syntactic Transfer: Models, new developments and implications* (pp. 277-298). John Benjamins. https://doi.org/10.1075/bpa.5.13gon

González Alonso, J., & Rothman, J. (2021). Avoiding the cum hoc ergo propter hoc fallacy: Comments and questions regarding Full Transfer Potential. *Second Language Research*, *37*(3), 423-428. https://doi.org/10.1177/0267658320934135

Gooskens, C., & Heeringa, W. (2004). The position of Frisian in the Germanic language area. In D. Gilbers, M. Schreuder & N. Knevel (Eds.), *On the boundaries of phonology and phonetics*. (pp. 61-87). University of Groningen.

Grosjean, F. (2001). The bilingual's language modes. In J. L. Nicol (Ed.), *One mind, two languages: Bilingual language processing*. (pp. 1-22). Blackwell.

Grosjean, F. (2010). *Bilingual: Life and reality*. Harvard University Press.

Harbert, W. (2006). *The Germanic languages*. Cambridge University Press. https://doi.org/10.1017/CBO9780511755071

Haeseryn, W., Romijn, K., Geerts, G., de Rooij, J., & van den Toorn, M. (1997a). 6.4.3.1.1 Vorming van de trappen van vergelijking (versie 2.1). *Algemene Nederlandse Spraakkunst*. Retrieved January 09, 2024, from https://e-ans.ivdnt.org/topics/pid/ans0604030101lingtopic

Haeseryn, W., Romijn, K., Geerts, G., de Rooij, J., & van den Toorn, M. (1997b). 6.4.3.1.2 Omschrijving van de trappen van vergelijking met meer en meest (versie 2.1). *Algemene Nederlandse Spraakkunst*. Retrieved January 09, 2024, from https://e-ans.ivdnt.org/topics/pid/ans0604030102lingtopic

Haeseryn, W., Romijn, K., Geerts, G., de Rooij, J., & van den Toorn, M. (1997c). 18.5.7.3.ii Eindgroepen met twee werkwoorden (versie 2.1). *Algemene Nederlandse Spraakkunst*. Retrieved January 09, 2024, from https://e-ans.ivdnt.org/topics/pid/ans1805070302lingtopic

Håkansson, G., Pienemann, M., & Sayehli, S. (2002). Transfer and typological proximity in the context of L2 processing. *Second Language Research*, *18*(3), 250-273. https://doi.org/10.1191/0267658302sr206oa

Hammarberg, B. (2001). Roles of L1 and L2 in L3 production and acquisition. In J. Cenoz, B. Hufeisen & U. Jessner (Eds.), *Cross-linguistic influence in third language acquisition: Psycholinguistic perspectives* (pp. 21-41). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781853595509-003

Hammarberg, B. (2010). The languages of the multilingual: Some conceptual and terminological issues. *International Review of Applied Linguistics in Language Teaching*, *48*(2-3), 91-104. https://doi.org/10.1515/iral.2010.005

Hazenberg, S., & Hulstijn, J. H. (1996). Defining a minimal receptive second-language vocabulary for non-native university students: An empirical investigation. *Applied Linguistics*, *17*(2), 145-163. https://doi.org/10.1093/applin/17.2.145

Heeringa, W., Golubovic, J., Gooskens, C., Schüppert, A., Swarte, F., & Voigt, S. (2013). Lexical and orthographic distances between Germanic, Romance and Slavic languages and their

relationship to geographic distance. In C. Gooskens & R. van Bezooijen (Eds.), *Phonetics in Europe: Perception and production* (pp. 99-137). Peter Lang.
Heeringa, W., Gooskens, C., & van Heuven, V. J. (2023). Comparing Germanic, Romance and Slavic: Relationships among linguistic distances. *Lingua*, *287*(103512). https://doi.org/10.1016/j.lingua.2023.103512
Hendriks, P. (2014). *Asymmetries between language production and comprehension*. Springer. https://doi.org/10.1007/978-94-007-6901-4
Hendriks, P., & Koster, C. (2010). Production/comprehension asymmetries in language acquisition. *Lingua*, *120*(8), 1887-1897. https://doi.org/10.1016/j.lingua.2010.02.002
Herdina, P., & Jessner, U. (2002). *A dynamic model of multilingualism: Perspectives of change in psycholinguistics*. Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781853595547
Hermans, T. (1995). De neerlandistiek in de Engelstalige wereld. *Neerlandica Extra Muros*, *33*(3) 96-99.
Hermas, A. (2010). Language acquisition as computational resetting: Verb movement in L3 initial state. *International Journal of Multilingualism*, *7*(4), 343-362. https://doi.org/10.1080/14790718.2010.487941
Hermas, A. (2014). Multilingual transfer: L1 morphosyntax in L3 English. *International Journal of Language Studies*, *8*(2), 1-24.
Hermas, A. (2015). The categorization of the relative complementizer phrase in third-language English: A feature re-assembly account. *International Journal of Bilingualism*, *19*(5), 587-607. https://doi.org/10.1177/1367006914527019
Huddleston, R. D., & Pullum, G. K. (2002). *The Cambridge Grammar of the English Language*. Cambridge University Press. https://doi.org/10.1017/9781316423530
Hufeisen, B. (2010). Theoretische Fundierung multiplen Sprachenlernens: Faktorenmodell 2.0. *Jahrbuch Deutsch als Fremdsprache, 36*, 200-207.
Hufeisen, B. (2020). Faktorenmodell: Eine angewandt linguistische Perspektive auf das Mehrsprachenlernen. In I. Gogolin, A. Hansen, S. McMonagle & D. Rauch (Eds.) *Handbuch Mehrsprachigkeit und Bildung*. Springer. https://doi.org/10.1007/978-3-658-20285-9_10
Hüning, M. (2020). De dwaaste superlatief. *Nederlands: Beobachtungen zur niederländischen Sprache*. https://blogs.fu-berlin.de/nederlands/2020/05/17/de-dwaaste-superlatief/
Hüning, M., Vogl, U., van der Wouden, T., & Verhagen, A. (2006). *Nederlands tussen Duits en Engels. Handelingen van de workshop op 30 september en 1 oktober 2005 aan de Freie Universität Berlin*. Stichting Neerlandistiek Leiden.
Internationale Vereniging voor Neerlandistiek (IVN) (n.d.). *Wereldkaart Nederlands*. Retrieved January 10, 2024, from https://www.ivn.nu/wereldkaart-nederlands-116
Jabbari, A. A., Achard-Bayle, G., & Ablali, D. (2018). Acquisition of L3 French wh-question structure by Persian-English bilinguals. *Cogent Education*, *5*(1), 1-18. https://doi.org/10.1080/2331186X.2018.1524551
Jain, S. (2020). *Languages vital to the future of the United States*. https://docs.google.com/document/d/1CxYs2ujuccM87uPARvDPyr74upr9mEXEKHrTArgS_98/edit#heading=h.aczyuw2yex2w
Janssens, G., & Marynissen, A. (2011). *Het Nederlands vroeger en nu*. Acco.
Jarvis, S. (2017). Transfer: An overview with an expanded scope. In A. Golden, S. Jarvis & K. Tenfjord (Eds.), *Crosslinguistic influence and distinctive patterns of language learning: Findings and insights from a learner corpus* (pp. 12-28). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781783098774-004
Jarvis, S., & Pavlenko, A. (2008). *Crosslinguistic influence in language and cognition*. Routledge. https://doi.org/10.4324/9780203935927

Jegerski, J. (2014). Self-paced reading. In J. Jegerski & B. VanPatten (Eds.), *Research methods in second language psycholinguistics* (pp. 20-49). Routledge. https://doi.org/10.4324/9780203123430

Jessner, U. (2008). Teaching third languages: Findings, trends and challenges. *Language Teaching*, *41*(1), 15-56. https://doi.org/10.1017/S0261444807004739

Jessner, U., Allgaüer-Hackl, E., & Hofer, B. (2016). Emerging multilingual awareness in educational contexts: From theory to practice. *The Canadian Modern Language Review/La revue canadienne des langues vivantes*, *72*(2), 157-182. https://doi.org/10.3138/cmlr.274600

Jin, F. (2009). Third language acquisition of Norwegian objects: Interlanguage transfer or L1 influence?. In Y.-K. I. Leung (Ed.), *Third language acquisition and Universal Grammar* (pp. 144-161). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781847691323-010

Just, M. A., Carpenter, P. A., & Wooley, J. D. (1982). Paradigms and processes in reading comprehension. *Journal of Experimental Psychology: General*, *111*(2), 228-238. https://doi.org/10.1037/0096-3445.111.2.228

Karsdorp, F., & Beekhuizen, B. F. (2010). Regelmaat in een regelloos systeem. De Nederlandse superlatief. *Voortgang, Jaarboek voor de Neerlandistiek*, 28, 29-51.

Keating, G. D., & Jegerski, J. (2015). Experimental designs in sentence processing research: A methodological review and user's guide. *Studies in Second Language Acquisition*, 37(1), 1-32. https://doi.org/10.1017/S0272263114000187

Kellerman, E. (1979). Transfer and non-transfer: Where we are now. *Studies in Second Language Acquisition*, *2*(1), 37-57. https://doi.org/10.1017/S0272263100000942

Kellerman, E. (1983). Now you see it, nor you don't. In S. Gass & L. Selinker (Eds.), *Language transfer in language learning* (pp. 112-134). Newbury House.

Kellerman, E. (1986). An eye for an eye: Crosslinguistic constraints on the development of the L2 lexicon. In E. Kellerman & M. Sharwood Smith (Eds.), *Crosslinguistic Influence in Second Language Acquisition* (pp. 35-48). Pergamon Press.

Kemp, C. (2007). Strategic processing in grammar learning: Do multilinguals use more strategies? *International Journal of Multilingualism*, *4*(4), 241-261. https://doi.org/10.2167/ijm099.0

Kiers, F. A. (2014). *Frequenter of meer frequent: Een corpusonderzoek naar de invloed van het Engels op de trappen van vergelijking in het Nederlands* [Master's thesis. Utrecht University]. UU Theses Repository. https://studenttheses.uu.nl/handle/20.500.12932/17224

Kopeckova, R., & Poarch, G. J. (2019). Teaching English as a third language in primary and secondary school: The potential of pluralistic approaches to language learning. In G. Putjata & Y. Danilovich (Eds.), *Sprachliche Vielfalt im Unterricht: Fachdidaktische Perspektiven auf Lehre und Forschung im DaZ-Modul* (pp. 219-230). Springer. https://doi.org/10.1007/978-3-658-23254-2_12

Kopeckova, R., & Poarch. G. J. (2022). Learning to teach English in the multilingual classroom utilizing the Framework of Reference for Pluralistic Approaches to Languages and Cultures. *Languages, 7*, 168. https://doi.org/10.3390/languages7030168

Lado, R. (1957). Linguistics across cultures: Applied linguistics for language teachers. University of Michigan Press.

Leenders, G. (2023). Een paradigmaverschuiving in het grammaticaonderwijs: Van vuistregels naar bewuste taalvaardigheid. In *36ste Conferentie Onderwijs Nederlands* (pp. 271-280). HSN Onderwijs conferentie Nederlands.

Leenders, G., de Graaff, R., & van Koppen, M. (2024). Bouwen aan bewustetaalvaardigheidsmetingen in het grammaticaonderwijs: Een instrumentatieonderzoek. *Levende Talen Tijdschrift*, *25*(1), 23-38.

Lemhöfer, K., & Broersma, M. (2012). Introducing LexTALE: A quick and valid lexical test for advanced learners of English. *Behavior Research Methods*, *44*, 325-343. https://doi.org/10.3758/s13428-011-0146-0

Lemhöfer, K., Dijkstra, T., & Michel, M. (2004). Three languages, one ECHO: Cognate effects in trilingual word recognition. *Language and Cognitive Processes*, *19*(5), 585-611. https://doi.org/10.1080/01690960444000007

Lenth, R. V. (2021). emmeans: Estimated marginal means, aka least-squares means. https://cran.r-project.org/web/packages/emmeans/index.html

Leung, Y.-K. I. (2003). Failed features versus full transfer full access in the acquisition of a third language: Evidence from tense and agreement. In J. M. Liceras, H. Zobl, & H. Goodluck (Eds.), *Proceedings of the 6th Generative Approaches to Second Language Acquisition Conference (GASLA 2002)*, (pp. 199-207). Cascadilla Proceedings Project.

Leung, Y.-K. I. (2006). Full transfer vs. partial transfer in L2 and L3 acquisition: Inquiries in linguistic development. In R. Slabakova, S. Montrul & P. Prévost (Eds.), *Inquiries in linguistic development: In honor of Lydia White*, (pp. 157-187). John Benjamins. https://doi.org/10.1075/z.133.10leu

Limesurvey GmbH. / LimeSurvey: An open source survey tool / LimeSurvey GmbH, Hamburg, Germany. http://www.limesurvey.org

Lindqvist, C. (2019). Didactic challenges in the multilingual classroom: The case of french as a foreign language. In M. Gutierrez-Mangado, M. Martínez-Adrián & F. Gallardo-del-Puerto (Eds.), *Cross-linguistic influence: from empirical evidence to classroom practice. Second language learning and teaching* (pp. 87-99). Springer. https://doi.org/10.1007/978-3-030-22066-2_5

Lloyd-Smith, A., Gyllstad, H., & Kupisch, T. (2017). Transfer into L3 English: Global accent in German-dominant heritage speakers of Turkish. *Linguistic Approaches to Bilingualism*, *7*(2), 131-162. https://doi.org/10.1075/lab.15013.llo

Louwerse, H. (2018). Het is de hoogste tijd dat we Nederlands als wereldtaal gaan zien. *Ons Erfdeel: Vlaams-Nederlands Cultureel Tijdschrift*, *61*(2), 11-18. Retrieved January 10, 2024, from https://www.de-lage-landen.com/article/het-is-de-hoogste-tijd-dat-we-nederlands-als-wereldtaal-gaan-zien

Louwerse, H. (2019a). Time for business: Dutch Studies in the UK. *The Low Countries*. Retrieved January 10, 2024, from https://www.the-low-countries.com/article/time-for-business

Louwerse, H. (2019b). Klaar om zaken te doen: Neerlandistiek in tijden van brexit. *De Lage Landen.* Retrieved January 10, 2024, from https://www.de-lage-landen.com/article/klaar-om-zaken-te-doen

Lozano, C. (2003). *Universal Grammar and focus constraints: The acquisition of pronouns and word order in non-native Spanish* [Doctoral dissertation, University of Granada]. DIGIBUG: Repositorio Institucional de la Universidad de Granada. http://hdl.handle.net/10481/22164

Luan, X., Masakazu, K., Sugawara, A., Kawasaki, Y., & Sugimori, E. (2024). The effect of previously acquired languages on third language acquisition. *Heliyon*, *10*(4). https://doi.org/10.1016/j.heliyon.2024.e26202

Lüdecke, D., Makowski, D., Waggoner, P., & Patil, I. (2021). performance: An R package for assessment, comparison and testing of statistical models. *Journal of Open Source Software*, *6*(60), 3139. https://doi.org/10.21105/joss.03139

Marinis, T. (2013). Online Psycholinguistic Methods in Second Language Acquisition. In: C. A. Chapelle (Ed). *The Encyclopedia of Applied Linguistics* (pp. 4307-4315). Wiley-Blackwell. https://doi.org/10.1002/9781405198431.wbeal0884

Marinis, T. (2010). On-line sentence processing methods in typical and atypical populations. In: S. Unsworth & E. Blom (Eds.). *Experimental Methods in Language Acquisition Research* (pp. 139-162). John Benjamins. https://doi.org/10.1075/lllt.27.09mar

Meisel, J. M. (1983). Transfer as a second-language strategy. *Language & communication*, *3*(1), 11-46. https://doi.org/10.1016/0271-5309(83)90018-6

Meißner, F.-J. (2004). Transfer und Transferieren. Anleitungen zum Interkomprehensionsunterricht. In H. G. Klein & D. Rutke (Eds.), *Neuere Forschungen zur Europäischen* Interkomprehension, (pp. 39-66). Shaker.

Meyer, C., & Weerman, F. (2016). Cracking the cluster: The acquisition of verb raising in Dutch. *Nederlandse Taalkunde*, *21*(2), 181-212. https://hdl.handle.net/11245/1.534990

Michel, M. (2022). Doe normaal in meer dan één taal! Tijdschrift voor taalbeheersing,44(1), 30-36. https://doi.org/10.5117/TVT2022.1.004.MICH

Michel, M., Vidon, C., de Graaff, R., & Lowie, W. (2021). Language Learning beyond English in the Netherlands: A fragile future. *European Journal of Applied Liguistics*, *9*(1), 159–182. https://doi.org/10.1515/eujal-2020-0020

Ministerie van Buitenlandse Zaken (n.d.). Nederlandse taal. Retrieved January 10, 2024, from https://www.nederlandenu.nl/over-het-koninkrijk/nederlandse-taal.

Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen (MSB) (Ed.) (2014). Kernlehrplan für die Sekundarstufe II Gymnasium/Gesamtschule in Nordrhein-Westfalen: Niederländisch.

Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen (MSB) (Ed.) (2020). Kernlehrplan für die Sekundarstufe I Gymnasium in Nordrhein-Westfalen: Niederländisch.

Missinne, L., & Hüning, M. (2019). Tussen samenwerking en behoud van zelfstandigheid: Neerlandistiek in het Duitse taalgebied. *De Lage Landen*. Retrieved January 10, 2024, from https://www.de-lage-landen.com/article/tussen-samenwerking-en-behoud-van-zelfstandigheid

Mondorf, B. (2009). *More support for more-support: The role of processing constraints on the choice between synthetic and analytic comparative forms*. John Benjamins. https://doi.org/10.1075/silv.4

Müller, S. (2023). *Germanic syntax: A constraint-based view*. Language Science Press. https://doi.org/10.5281/zenodo.7733033

Nakata, T., Tamura, Y., & Aubrey, S. (2020). Examining the validity of the LexTALE test for Japanese college students. *The Journal of AsiaTEFL*, *17*(2), 335-348. http://dx.doi.org/10.18823/asiatefl.2020.17.2.2.335

Na Ranong, S., & Leung, Y.-K. I. (2009). Null objects in L1 Thai-L2 English-L3 Chinese: An empiricist take on a theoretical problem. In Y.-K. I. Leung (Ed.), *Third language acquisition and Universal Grammar* (pp. 162-191). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781847691323-011

Nederlandse Taalunie (n.d.). *Feiten & cijfers: Wat iedereen zou moeten weten over het Nederlands*. Retrieved January 10, 2024, from https://taalunie.org/informatie/24/feiten-cijfers

Nederlandse Taalunie (2017). *Studentenaantallen buitenlandse neerlandistiek 2017*. Retrieved January 10, 2024, from https://taalunie.org/informatie/92/cijfers-neerlandistiek-in-het-buitenland

Nederlandse Taalunie (2018). *Studentenaantallen buitenlandse neerlandistiek 2018*. Retrieved January 10, 2024, from https://taalunie.org/informatie/92/cijfers-neerlandistiek-in-het-buitenland

Nederlandse Taalunie (2020). *De leerling aan het woord: Belevingsonderzoek onderwijs Nederlands in de buurtaalregio's*. Retrieved January 10, 2024, from https://taalunie.org/publicaties/192/belevingsonderzoek-de-leerling-aan-het-woord

Niedersächsischen Kultusministerium (MK) (Ed.) (2017a). Kerncurriculum für das Gymnasium Schuljahrgänge 6-10: Niederländisch.

Niedersächsischen Kultusministerium (MK) (Ed.) (2017b). Kerncurriculum für das Gymnasium - gymnasiale Oberstufe, die Gesamtschule - gymnasiale Oberstufe, das Berufliche Gymnasium, das Abendgymnasium, das Kolleg: Niederländisch.

Odlin, T. (1989). *Language transfer: Cross-Linguistic influence in language learning*. Cambridge University Press. https://doi.org/10.1017/CBO9781139524537

Otwinowska, A. (2016). *Cognate vocabulary in language acquisition and use: Attitudes, awareness, activation*. Multilingual Matters. https://doi.org/10.21832/9781783094394

Paradis, M. (2004). *A Neurolinguistic Theory of Bilingualism* [Studies in Bilingualism 18]. John Benjamins. https://doi.org/10.1075/sibil.18

Paradis, M. (2009). *Declarative and Procedural Determinants of Second Languages* [Studies in Bilingualism 40]. John Benjamins. https://doi.org/10.1075/sibil.40

Pauwels, A. (1953). *De plaats van het hulpwerkwoord, verleden deelwoord en infinitief in de Nederlandse bijzin.* Symons.

Platzack, C. (1996). The initial hypothesis of syntax: A minimalist perspective on language acquisition and attrition. In H. Clahsen (Ed.), *Generative perspectives on language acquisition: Empirical findings, theoretical considerations, crosslinguistic comparisons* (pp. 369-414). John Benjamins. https://doi.org/10.1075/lald.14.15pla

Prévost, P., Tuller, L., Galloux, A., & Barthez, M. A. (2017). Complexity and production/comprehension asymmetries in the acquisition of wh-questions in French: Comparing second language acquisition and language impairment in children. In E. Blom, L. Cornips & J. Schaeffer (Eds.), *Cross-linguistic influence in bilingualism: In honor of Aafke Hulk* (pp. 231-258). Benjamins. https://doi.org/10.1075/sibil.52.11pre

Psychology Software Tools Inc. [E-Prime 3.0]. (2016). Retrieved from https://support.pstnet.com/

Psychology Software Tools Inc. [E-Prime Go]. (2020). Retrieved from https://support.pstnet.com/

Puig-Mayenco, E., Chaouch-Orozco, A., Liu, H., & Martín-Villena, F. (2023). The LexTALE as a measure of L2 global proficiency: A cautionary tale based on a partial replication of Lemhöfer and Broersma (2012). *Linguistic Approaches to Bilingualism*, *13*(3) 299-314. https://doi.org/10.1075/lab.22048.pui

Puig-Mayenco, E., González Alonso, J., & Rothman, J. (2020). A systematic review of transfer studies in third language acquisition. *Second Language Research*, *36*(1), 31-64. https://doi.org/10.1177/0267658318809147

R Core Team. (2023). R: A language and environment for statistical computing. R foundation for statistical computing, Vienna, Austria. https://www.R-project.org/

Reitsma, F. (2016). *Einführung in die Fachdidaktik Niederländisch*. Agenda.

Ringbom, H. (1987). *The role of the first language in foreign language learning*. Multilingual Matters.

Ringbom, H. (2001). Lexical transfer in L3 production. In J. Cenoz, B. Hufeisen & U. Jessner (Eds.), *Cross-linguistic influence in third language acquisition: Psycholinguistic perspectives* (pp. 59-68). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781853595509-005

Ringbom, H. (2007). *Cross-linguistic similarity in foreign language learning*. Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781853599361

Ringbom, H. & Jarvis, S. (2009): The importance of cross-linguistic similarity in foreign language learning. In C. J. Doughty & M. H. Long (Eds.): *The Handbook of Language Teaching* (pp. 106-118). Wiley-Blackwell. https://doi.org/10.1002/9781444315783.ch7

Rothman, J. (2011). L3 syntactic transfer selectivity and typological determinacy: The Typological Primacy Model. *Second Language Research*, *27*(1), 107-127. https://doi.org/10.1177/0267658310386439

Rothman, J. (2013). Cognitive economy, non-redundancy and typological primacy in L3 acquisition: Evidence from initial stages of L3 Romance. In S. Baauw, F. Dirjkoningen & M. Pinto (Eds.), *Romance languages and linguistic theory 2011* (pp. 217-247). John Benjamins. https://doi.org/10.1075/rllt.5.11rot

Rothman, J. (2015). Linguistic and cognitive motivations for the Typological Primacy Model (TPM) of third language (L3) transfer: Timing of acquisition and proficiency considered. *Bilingualism: Language and Cognition*, *18*(2), 179-190. https://doi.org/10.1017/S136672891300059X

Rothman, J., & Cabrelli Amaro, J. (2010). What variables condition syntactic transfer? A look at the L3 initial state. *Second Language Research*, *26*(2), 189-218. https://doi.org/10.1177/0267658309349410

Rothman, J., González Alonso, J., & Puig-Mayenco, E. (2019). *Third language acquisition and linguistic transfer*. Cambridge University Press. https://doi.org/10.1017/9781316014660

Ruigendijk, E., Friedmann, N., Novogrodsky, R., & Balaban, N. (2010). Symmetry in comprehension and production of pronouns: A comparison of German and Hebrew. *Lingua*, *120*(8), 1991-2005. https://doi.org/10.1016/j.lingua.2010.02.009

Sánchez, L. (2020). From L2 to L3, verbs getting into place: A study on interlanguage transfer and L2 syntactic proficiency. In C. Bardel & L. Sánchez (Eds.), *Third language acquisition. Age, proficiency and multilingualism*, 209-235. Language Science Press. https://doi.org/10.5281/zenodo.4138753

Sánchez, L., & Bardel, C. (2017). Transfer from the L2 in third language learning: A study on L2 proficiency. In T. Angelovska & A. Hahn (Eds.), *L3 syntactic transfer: Models, new developments and implications* (pp. 223-250). John Benjamins. https://doi.org/10.1075/bpa.5.11san

Schepens, J.J., van der Slik, F., & van Hout, R. (2016). L1 and L2 Distance Effects in Learning L3 Dutch. *Language Learning*, *66*, 224-256. https://doi.org/10.1111/lang.12150

Schwartz, B. D., & Sprouse, R. A. (1996). L2 cognitive states and the Full Transfer/Full Access Model. *Second Language Research 12*(1), 40-72.

Schwartz, B. D., & Sprouse, R. A. (2021). The Full Transfer/Full Access Model and L3 cognitive states. *Linguistic Approaches to Bilingualism*, *11*(1), 1-29. https://doi.org/10.1075/lab.20055.sch

Sharwood Smith, M., & Kellerman, E. (1986). Crosslinguistic influence in second language acquisition: An introduction. In E. Kellerman & M. Sharwood Smith (Eds.), *Crosslinguistic influence in second language acquisition* (pp. 1-9). Pergamon Press.

Slabakova, R. (2017). The Scalpel Model of third language acquisition. *International Journal of Bilingualism*, *21*(6), 651-665. https://doi.org/10.1177/1367006916655413

Spada, N. (2015). SLA research and L2 pedagogy: Misapplications and questions of relevance. *Language Teaching*, *48*(1), 69-81. https://doi.org/10.1017/S026144481200050X

Stadt, R., Hulk, A., & Sleeman, P. (2016). The influence of L2 English and immersion education on L3 French in the Netherlands. In J. Audring & S. Lestrade (Eds.), *Linguistics in the Netherlands* (pp. 152-165). John Benjamins.

Stadt, R., Hulk, A., & Sleeman, P. (2018, March 15-16). *Verb placement in L3 German and L3 French: The role of L2 English* [Conference presentation]. LiDi 2018: Modern Linguistics & Language Didactics, Konstanz, Germany.

Stefanowitsch, A., & Flach, S. (2017). The Corpus-Based Perspective on Entrenchment. In H. Schmid (Ed.), *Entrenchment and the psychology of language learning: How we reorganize and adapt linguistic knowledge* (pp. 101-128). De Gruyter. https://doi.org/10.1515/9783110341423-006

Stroop, J. (1970). Systeem in gesproken werkwoordsgroepen. *Taal en Tongval*, *22*, 128-147.

Stroop, J. (2009). Twee- en meerledige werkwoordsgroepen in gesproken Nederlands. In E. Beijk, L. Colman, M. Göbel, F. Heyvaert, T. Schoonheim, R. Tempelaars & V. Waszink (Eds.) *Fons verborum: Feestbundel voor prof. dr. A.M.F.J. (Fons) Moerdijk aangeboden door vrienden en collega's bij zijn afscheid van het Instituut voor Nederlandse Lexicologie* (pp. 459-469). Instituut voor Nederlandse Lexicologie.

Trask, R. L. (2000). *The Dictionary of Historical and Comparative Linguistics*. Edinburgh University Press. https://doi.org/10.1515/9781474473316

Tremblay, M.-C. (2006). Cross-linguistic influence in third language acquisition: The role of L2 proficiency and L2 exposure. *Cahiers Linguistiques d'Ottawa / Ottawa Papers in Linguistics*, *34*, 109-119.

Ullman, M. T. (2001). The neural basis of lexicon and grammar in first and second language: The declarative/procedural model. *Bilingualism: Language and Cognition*, *4*(2), 105-122. https://doi.org/10.1017/S1366728901000220

Ullman, M. T. (2004). Contributions of memory circuits to language: The declarative/procedural model. *Cognition*, *92*(1-2), 231-270. https://doi.org/10.1016/j.cognition.2003.10.008

Ullman, M. T. (2005). A cognitive neuroscience perspective on second language acquisition: The declarative/procedural model. In C. Sanz (Ed.), *Mind and Context in Adult Second Language Acquisition*, (pp. 141-178). Georgetown University Press.

University of Groningen (RUG). (2022). *Language requirements per faculty*. Retrieved January 10, 2024, from https://www.rug.nl/education/bachelor/international-students/admission-and-application/application-admission-procedure/entry-requirements/language-requirements?lang=en

Unsworth, S. (2007). L1 and L2 acquisition between sentence and discourse: Comparing production and comprehension in child Dutch. *Lingua*, *117*(11), 1930-1958. https://doi.org/10.1016/j.lingua.2006.11.009

Urbanek, L. (2022, August 22-26): *Filmondertitels vanuit het perspectief van NVT-leerkrachten in Duitsland* [Conference presentation]. 21e Colloquium Neerlandicum (Internationale Vereniging voor Neerlandistiek), Nijmegen, the Netherlands.

Vainikka, A., & Young-Scholten, M. (1996). Gradual development of L2 phrase structure. *Second Language Research*, *12*(1), 7-39. https://doi.org/10.1177/026765839601200102

van Craenenbroeck, J., van Koppen, M., & van den Bosch, A. (2019). A quantitative-theoretical analysis of syntactic microvariation: Word order in Dutch verb clusters. *Language 95*(2), 333-370. https://doi.org/10.1353/lan.2019.0033

Van Dale Uitgevers (2024). *Van Dale*. https://www.vandale.nl/

van der Sijs, N. (2010). Etymologiebank. Retrieved January 10, 2024, from http://etymologiebank.nl/

van der Slik, F., Hout, R. van, & Schepens, J. (2019). The role of morphological complexity in predicting the learnability of an additional language: The case of La (additional language) Dutch. *Second Language Research*, *35*(1), 47-70. https://doi.org/10.1177/0267658317691322

van der Wouden, T. (2012). 2010 - Roel Vismans, Matthias Hüning & Fred Weerman: 'Dutch between English and German'. Journal of Germanic Linguistics 22, special issue 04. *Internationale Neerlandistiek*, *50*(1), 156-158. https://doi.org/10.5117/IVN2012.0.DERW

van Haeringen, C. B. (1956). *Nederlands tussen Duits en Engels*. Servire.

VanPatten, B. (2015). Foundations of processing instruction. *International Review of Applied Linguistics in Language Teaching*, *53*(2), 91-109. https://doi.org/10.1515/iral-2015-0005

Verbruggen, K., & Tamse, M. (2019). Op naar de eindstreep. Nederlands voor Duitstaligen. Coutinho.

Verheyen, M., & Collet, T. (2019). The state of Netherlandic Studies in Canada. The Low Countries. Retrieved January 10, 2024, from https://www.the-low-countries.com/article/the-state-of-netherlandic-studies-in-canada

Vismans, R., & Wenzel, V. (2012). Dutch between English and German: Language learners' perceptions of linguistic distance. In E. Ruigendijk, F. Van de Velde & R. Vismans (Eds.) *Germanic Sandwich 2010: Dutch between English and German; Special volume of Leuvense bijdragen*, *98*, 4-26.

Venables, W. N., & Ripley, B. D. (2002). *Modern Applied Statistics with S*. Springer.

Weinreich, U. (1953). *Languages in contact: Findings and problems*. Publications of the Linguistic Circle of New York.

Westergaard, M. (2009). *The acquisition of word order: Micro-cues, information structure and economy*. [Linguistik Aktuell/Linguistics Today, 145]. John Benjamins. https://doi.org/10.1075/la.145

Westergaard, M. (2014). Linguistic variation and micro-cues in first language acquisition. *Linguistic Variation*, *14*(1), 26-45. https://doi.org/10.1075/lv.14.1.02wes

Westergaard, M. (2021a). Microvariation in multilingual situations: The importance of property-by-property acquisition. *Second Language Research*, *37*(3), 379-407. https://doi.org/10.1177/0267658319884116

Westergaard, M. (2021b). L3 acquisition and crosslinguistic influence as co-activation: Response to commentaries on the keynote 'Microvariation in multilingual situations: The importance of property-by-property acquisition'. *Second Language Research*, *37*(3), 501-518. https://doi.org/10.1177/02676583211007897

Westergaard, M., Mitrofanova, N., Mykhaylyk, R., & Rodina, Y. (2017). Crosslinguistic influence in the acquisition of a third language: The Linguistic Proximity Model. *International Journal of Bilingualism*, *21*(6), 666-682. https://doi.org/10.1177/1367006916648859

White, L. (1989). *Universal Grammar and second language acquisition*. John Benjamins. https://doi.org/10.1075/lald.1

White, L. (2003). *Second language acquisition and Universal Grammar*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815065

Williams, C. (1994). Doethur mewn athroniaeth. Arfarniad o ddulliau dysgu ac addysgu yng nghyd-destun addysg uwchradd ddwyieithog [Doctoral dissertation, University of Wales]. Research Portal Bangor University. https://research.bangor.ac.uk/portal/en/theses/arfarniad-o-ddulliau-dysgu-ac-addysgu-yng-nghyddestun-addysg-uwchradd-ddwyieithog(fc2ad869-3609-4a10-afc4-08180793fd70).html

Williams, S., & Hammarberg, B. (1998) Language switches in L3 production: Implications for a polyglot speaking model. *Applied Linguistics*, *19*(3), 295-333.

Wurmbrand, S. (2004). West Germanic verb clusters: The empirical domain. In K. É. Kiss & H. van Riemsdijk (Eds.), *Verb Clusters: A Study of Hungarian, German, and Dutch* (pp. 43-85). John Benjamins. http://dx.doi.org/10.1075/la.69.05wur.

Wurmbrand, S. (2006). Verb clusters, verb raising, and restructuring. In M. Everaert & H. van Riemsdijk (Eds.), *The Blackwell Companion to Syntax* (pp. 229-343). Blackwell Publishing. http://dx.doi.org/10.1002/9780470996591.ch75

Zwart, J.-W., (2011), *The syntax of Dutch*. Cambridge University Press.

Zuckerman, S. (2001). *The Acquisition of "optional" Movement* [Doctoral dissertation, University of Groningen]. Research Output Repository University of Groningen. https://research.rug.nl/en/publications/the-acquisition-of-optional-movement

APPENDIX A: QUESTIONNAIRE PSYCHOTYPOLOGY

From the following list of eight languages, choose the three languages you think are most similar to Dutch. Put the language most similar to Dutch in first place. Select a total of three languages. Take a guess if you are unsure.

	Danish	Welsh	German	Czech	English	Spanish	French	Swedish
1st place	□	□	□	□	□	□	□	□
2nd place	□	□	□	□	□	□	□	□
3rd place	□	□	□	□	□	□	□	□

In what way is the language you ranked first most similar to Dutch?

_____

_____

Think about the sentence structure of Dutch. From the following list of eight languages, choose the three languages that you think are most similar to Dutch in terms of sentence structure. Put the language with the most similarities to Dutch sentence structure in first place. Select a total of three languages. Take a guess if you are unsure.

	Danish	Welsh	German	Czech	English	Spanish	French	Swedish
1st place	□	□	□	□	□	□	□	□
2nd place	□	□	□	□	□	□	□	□
3rd place	□	□	□	□	□	□	□	□

Think about inflection (declension & conjugation) and word formation of Dutch. From the following list of eight languages, choose the three languages that you think are most similar to Dutch in terms of inflection and word formation. Put the language with the most similarity to Dutch inflection and word formation in first place. Select a total of three languages. Select a total of three languages. Take a guess if you are unsure.

	Danish	Welsh	German	Czech	English	Spanish	French	Swedish
1st place	□	□	□	□	□	□	□	□
2nd place	□	□	□	□	□	□	□	□
3rd place	□	□	□	□	□	□	□	□

APPENDIX B: QUESTIONNAIRE PERSONAL AND LINGUISTIC DATA

Do you have normal hearing?

yes □ no □

Do you have normal (possibly corrected by glasses/lenses) vision?

yes □ no □

Do you have a cognitive disorder?

yes □ no □

Are you right- or left-handed?

right-handed □ left-handed □

How old are you?

_____

What is your gender?

female □ divers □

male □ no answer □

What language(s) did you grow up with at home?

_____

_____

What other languages have you learned? List all the languages you have learned, even if it was only for a short time. State since when (age) and for how long you have spoken the languages. For example: German (age: 5, 3 years).

_____
_____

How well do you speak English/German[19]? Please give a self-assessment of your level of English/German.

very good	□	sufficient	□
good	□	insufficient	□

How well do you speak Dutch? Please give a self-assessment of your level of Dutch[20].

very good	□	sufficient	□
good	□	insufficient	□

What is your profession or occupation?

student	□	other:	_____

At which email address can we reach you?

_____

[19] The questionnaire for German-speaking learners of L3 Dutch with L2 English included this question for their L2 English; the questionnaire for English-speaking learners of L3 Dutch with L2 German included this question for their L2 German; and the questionnaire for L1 speakers of Dutch included this question for both English and German.

[20] Only the questionnaires for German-speaking learners of L3 Dutch and English-speaking learners of L3 Dutch included this question.

APPENDIX C: ITEMS PROCESSING AND COMPREHENSION STUDY

Test items

no.	condition	set	item
1	SUP_MOR	1	Ik denk dat de lieve priester de emotioneelste priester van alle priesters is.
2	SUP_SYN	1	Ik denk dat de lieve priester de meest emotionele priester van alle priesters is.
3	SUP_MOR	2	Zij denkt dat de wilde appel de natuurlijkste appel van alle appels is.
4	SUP_SYN	2	Zij denkt dat de wilde appel de meest natuurlijke appel van alle appels is.
5	SUP_MOR	3	Hij gelooft dat de laatste spreker de negatiefste spreker van alle sprekers is.
6	SUP_SYN	3	Hij gelooft dat de laatste spreker de meest negatieve spreker van alle sprekers is.
7	SUP_MOR	4	Ik vind dat de nieuwe kamer de persoonlijkste kamer van alle kamers is.
8	SUP_SYN	4	Ik vind dat de nieuwe kamer de meest persoonlijke kamer van alle kamers is.
9	SUP_MOR	5	Zij gelooft dat de oude dokter de intelligentste dokter van alle dokters is.
10	SUP_SYN	5	Zij gelooft dat de oude dokter de meest intelligente dokter van alle dokters is.
11	SUP_MOR	6	Hij vindt dat de vierde foto de opmerkelijkste foto van alle foto's is.
12	SUP_SYN	6	Hij vindt dat de vierde foto de meest opmerkelijke foto van alle foto's is.
13	SUP_MOR	7	Ik geloof dat de grote visser de ongelukkigste visser van alle vissers is.
14	SUP_SYN	7	Ik geloof dat de grote visser de meest ongelukkige visser van alle vissers is.
15	SUP_MOR	8	Zij denkt dat de luide moeder de agressiefste moeder van alle moeders is.
16	SUP_SYN	8	Zij denkt dat de luide moeder de meest agressieve moeder van alle moeders is.
17	SUP_MOR	9	Hij denkt dat de derde fase de intensiefste fase van alle fases is.
18	SUP_SYN	9	Hij denkt dat de derde fase de meest intensieve fase van alle fases is.
19	SUP_MOR	10	Ik vind dat de jonge auteur de creatiefste auteur van alle auteurs is.
20	SUP_SYN	10	Ik vind dat de jonge auteur de meest creatieve auteur van alle auteurs is.
21	SUP_MOR	11	Zij vindt dat de laatste actie de origineelste actie van alle acties is.
22	SUP_SYN	11	Zij vindt dat de laatste actie de meest originele actie van alle acties is.
23	SUP_MOR	12	Hij gelooft dat de rijke vader de sympathiekste vader van alle vaders is.
24	SUP_SYN	12	Hij gelooft dat de rijke vader de meest sympathieke vader van alle vaders is.
25	PART_AUX	13	Ik denk dat de student gedroomd heeft en de professor niet.
26	AUX_PART	13	Ik denk dat de student heeft gedroomd en de professor niet.
27	PART_AUX	14	Zij denkt dat de jongen gehuild heeft en de grootvader niet.
28	AUX_PART	14	Zij denkt dat de jongen heeft gehuild en de grootvader niet.
29	PART_AUX	15	Hij gelooft dat de dame gedanst heeft en de minister niet.
30	AUX_PART	15	Hij gelooft dat de dame heeft gedanst en de minister niet.
31	PART_AUX	16	Ik denk dat de vader geslapen heeft en de grootvader niet.
32	AUX_PART	16	Ik denk dat de vader heeft geslapen en de grootvader niet.
33	PART_AUX	17	Zij gelooft dat de koning gedronken heeft en de president niet.
34	AUX_PART	17	Zij gelooft dat de koning heeft gedronken en de president niet.
35	PART_AUX	18	Hij gelooft dat de soldaat gezongen heeft en de officier niet.
36	AUX_PART	18	Hij gelooft dat de soldaat heeft gezongen en de officier niet.
37	PART_AUX	19	Ik geloof dat de dokter geantwoord heeft en de specialist niet.
38	AUX_PART	19	Ik geloof dat de dokter heeft geantwoord en de specialist niet.
39	PART_AUX	20	Zij denkt dat de auteur gestudeerd heeft en de criticus niet.
40	AUX_PART	20	Zij denkt dat de auteur heeft gestudeerd en de criticus niet.
41	PART_AUX	21	Hij denkt dat de dokter gelachen heeft en de patiënt niet.
42	AUX_PART	21	Hij denkt dat de dokter heeft gelachen en de patiënt niet.

43	PART_AUX	22	Ik geloof dat de spreker gelogen heeft en de journalist niet.
44	AUX_PART	22	Ik geloof dat de spreker heeft gelogen en de journalist niet.
45	PART_AUX	23	Zij gelooft dat de visser gezwommen heeft en de kapitein niet.
46	AUX_PART	23	Zij gelooft dat de visser heeft gezwommen en de kapitein niet.
47	PART_AUX	24	Hij denkt dat de moeder gebakken heeft en de grootmoeder niet.
48	AUX_PART	24	Hij denkt dat de moeder heeft gebakken en de grootmoeder niet.

Distractor items

no.	condition	set	item
49	LD_subj	26	Wie denk je dat de mensen ziet?
50	LD_obj	26	Wie denk je dat de mensen zien?
51	PM_subj	26	Wat denk je wie de mensen ziet?
52	PM_obj	26	Wat denk je wie de mensen zien?
53	LD_subj	27	Wie denk je dat de ministers evalueert?
54	LD_obj	27	Wie denk je dat de ministers evalueren?
55	PM_subj	27	Wat denk je wie de ministers evalueert?
56	PM_obj	27	Wat denk je wie de ministers evalueren?
57	LD_subj	28	Wie denk je dat de kapiteins hoort?
58	LD_obj	28	Wie denk je dat de kapiteins horen?
59	PM_subj	28	Wat denk je wie de kapiteins hoort?
60	PM_obj	28	Wat denk je wie de kapiteins horen?
61	LD_subj	29	Wie denk je dat de studenten helpt?
62	LD_obj	29	Wie denk je dat de studenten helpen?
63	PM_subj	29	Wat denk je wie de studenten helpt?
64	PM_obj	29	Wat denk je wie de studenten helpen?
65	LD_subj	30	Wie denk je dat de auteurs motiveert?
66	LD_obj	30	Wie denk je dat de auteurs motiveren?
67	PM_subj	30	Wat denk je wie de auteurs motiveert?
68	PM_obj	30	Wat denk je wie de auteurs motiveren?
69	LD_subj	31	Wie denk je dat de zangers volgt?
70	LD_obj	31	Wie denk je dat de zangers volgen?
71	PM_subj	31	Wat denk je wie de zangers volgt?
72	PM_obj	31	Wat denk je wie de zangers volgen?
73	LD_subj	32	Wie denk je dat de vaders spreekt?
74	LD_obj	32	Wie denk je dat de vaders spreken?
75	PM_subj	32	Wat denk je wie de vaders spreekt?
76	PM_obj	32	Wat denk je wie de vaders spreken?
77	LD_subj	33	Wie denk je dat de moeders zoekt?
78	LD_obj	33	Wie denk je dat de moeders zoeken?
79	PM_subj	33	Wat denk je wie de moeders zoekt?
80	PM_obj	33	Wat denk je wie de moeders zoeken?
81	LD_subj	34	Wie denk je dat de dokters gelooft?
82	LD_obj	34	Wie denk je dat de dokters geloven?
83	PM_subj	34	Wat denk je wie de dokters gelooft?
84	PM_obj	34	Wat denk je wie de dokters geloven?
85	LD_subj	35	Wie denk je dat de dansers mailt?
86	LD_obj	35	Wie denk je dat de dansers mailen?
87	PM_subj	35	Wat denk je wie de dansers mailt?
88	PM_obj	35	Wat denk je wie de dansers mailen?
89	LD_subj	36	Wie denk je dat de officiers kust?
90	LD_obj	36	Wie denk je dat de officiers kussen?

91	PM_subj	36	Wat denk je wie de officiers kust?
92	PM_obj	36	Wat denk je wie de officiers kussen?
93	LD_subj	37	Wie denk je dat de managers kent?
94	LD_obj	37	Wie denk je dat de managers kennen?
95	PM_subj	37	Wat denk je wie de managers kent?
96	PM_obj	37	Wat denk je wie de managers kennen?
97	LD_subj	38	Wie denk je dat de dochters schrijft?
98	LD_obj	38	Wie denk je dat de dochters schrijven?
99	PM_subj	38	Wat denk je wie de dochters schrijft?
100	PM_obj	38	Wat denk je wie de dochters schrijven?
101	LD_subj	39	Wie denk je dat de prinsessen haat?
102	LD_obj	39	Wie denk je dat de prinsessen haten?
103	PM_subj	39	Wat denk je wie de prinsessen haat?
104	PM_obj	39	Wat denk je wie de prinsessen haten?
105	LD_subj	40	Wie denk je dat de koningen accepteert?
106	LD_obj	40	Wie denk je dat de koningen accepteren?
107	PM_subj	40	Wat denk je wie de koningen accepteert?
108	PM_obj	40	Wat denk je wie de koningen accepteren?
109	LD_subj	41	Wie denk je dat de prinsen dankt?
110	LD_obj	41	Wie denk je dat de prinsen danken?
111	PM_subj	41	Wat denk je wie de prinsen dankt?
112	PM_obj	41	Wat denk je wie de prinsen danken?
113	LD_subj	42	Wie denk je dat de priesters respecteert?
114	LD_obj	42	Wie denk je dat de priesters respecteren?
115	PM_subj	42	Wat denk je wie de priesters respecteert?
116	PM_obj	42	Wat denk je wie de priesters respecteren?
117	LD_subj	43	Wie denk je dat de piloten informeert?
118	LD_obj	43	Wie denk je dat de piloten informeren?
119	PM_subj	43	Wat denk je wie de piloten informeert?
120	PM_obj	43	Wat denk je wie de piloten informeren?
121	LD_subj	44	Wie denk je dat de inspecteurs contacteert?
122	LD_obj	44	Wie denk je dat de inspecteurs contacteren?
123	PM_subj	44	Wat denk je wie de inspecteurs contacteert?
124	PM_obj	44	Wat denk je wie de inspecteurs contacteren?
125	LD_subj	45	Wie denk je dat de professors provoceert?
126	LD_obj	45	Wie denk je dat de professors provoceren?
127	PM_subj	45	Wat denk je wie de professors provoceert?
128	PM_obj	45	Wat denk je wie de professors provoceren?
129	LD_subj	46	Wie denk je dat de passagiers slaat?
130	LD_obj	46	Wie denk je dat de passagiers slaan?
131	PM_subj	46	Wat denk je wie de passagiers slaat?
132	PM_obj	46	Wat denk je wie de passagiers slaan?
133	LD_subj	47	Wie denk je dat de vissers groet?
134	LD_obj	47	Wie denk je dat de vissers groeten?
135	PM_subj	47	Wat denk je wie de vissers groet?
136	PM_obj	47	Wat denk je wie de vissers groeten?
137	LD_subj	48	Wie denk je dat de soldaten verstaat?
138	LD_obj	48	Wie denk je dat de soldaten verstaan?
139	PM_subj	48	Wat denk je wie de soldaten verstaat?
140	PM_obj	48	Wat denk je wie de soldaten verstaan?
141	LD_subj	49	Wie denk je dat de jongens mist?

142	LD_obj	49	Wie denk je dat de jongens missen?
143	PM_subj	49	Wat denk je wie de jongens mist?
144	PM_obj	49	Wat denk je wie de jongens missen?

Filler items

no.	condition	set	item
145	Gram	101	Ik denk dat de auteur aan de tekst werkt en de journalist niet.
146	Gram	102	Ik geloof dat de priester op de koning wacht.
147	Gram	103	Zij denkt dat de visser aan de vis denkt en de kapitein niet.
148	Gram	104	Zij gelooft dat de moeder naar de hond zoekt.
149	Gram	105	Hij denkt dat de patiënt om de clown lacht en de dokter niet.
150	Gram	106	Hij gelooft dat de vader naar de muziek luistert.
151	Gram	107	Wie heeft de piloot in de hal gegroet?
152	Gram	108	Wie heeft de priester in de kerk gedankt?
153	Gram	109	Wat heeft de bakker op de tafel gelegd?
154	Gram	110	Wat heeft de student in de school gezocht?
155	Gram	111	Welke kat heeft de vader in de kamer gezien?
156	Gram	112	Welke zanger heeft de musicus in de hal gehoord?
157	Mild	113	Ik vind dat het nieuwe dokter vriendelijk is en de oude dokter niet.
158	Mild	114	Ik denk dat het jonge patiënt gelukkig is.
159	Mild	115	Zij vindt dat het lange test complex is en de korte test niet.
160	Mild	116	Zij gelooft dat het grote danser creatief is.
161	Mild	117	Hij vindt dat het derde foto interessant is en de vierde foto niet.
162	Mild	118	Hij gelooft dat het rijke minister sympathiek is.
163	Mild	119	Wie gelooft de president niet dat van de prins houdt?
164	Mild	120	Wie gelooft de zanger niet dat met de directeur spreekt?
165	Mild	121	Wie gelooft de spreker niet dat van de conferentie droomt?
166	Mild	122	Welke oude professor zijn briljant?
167	Mild	123	Welke korte tekst zijn interessant?
168	Mild	124	Welke jonge prins zijn arrogant?
169	Strong	125	Ik geloof dat de test lange complex is.
170	Strong	126	Zij vindt dat de foto grote leuk is.
171	Strong	127	Hij gelooft dat de minister oude sympathiek is en de nieuwe minister niet.
172	Strong	128	Ik denk dat de patiënt jonge gelukkig is en de oude patiënt niet.
173	Strong	129	Zij vindt dat de actieve discussie interessant is en de discussie inactieve niet.
174	Strong	130	Hij denkt dat de nieuwe danser uitstekend is en de danser oude niet.
175	Strong	131	De grootmoeder zoekt naar hond de en de moeder niet.
176	Strong	132	De professor helpt met test de en de student niet.
177	Strong	133	De barones houdt van prins de en de prinses niet.
178	Strong	134	De musicus spreekt met de directeur en zanger de niet.
179	Strong	135	De passagier droomt van de storm en piloot de niet.
180	Strong	136	De officier gelooft in de missie en soldaat de niet.
181	Strong	137	Welke zoon denkt dat de grootmoeder oude naar de grootvader luistert?
182	Strong	138	Welke student denkt dat de professor jonge met de test helpt?
183	Strong	139	Welke pianist denkt dat de musicus grote over de danser spreekt?
184	Strong	140	Welke dochter denkt dat de hond onder tafel de ligt?
185	Strong	141	Welke passagier denkt dat de piloot van storm de droomt?
186	Strong	142	Welke minister denkt dat de president met koning de spreekt?
187	Strong	143	Wie kent de pianist de zanger die in de hal kust?
188	Strong	144	Wie kent de bakker de moeder die op de markt ziet?
189	Strong	145	Wie kent de student de professor die op de straat groet?

190	Strong	146	Welke musicus kent de directeur de danser die sympathiek vindt?
191	Strong	147	Welke minister kent de koning de president die vriendelijk vindt?
192	Strong	148	Welke journalist kent de fotograaf de auteur die sensationeel vindt?

Practice items

no.	condition	set	item
193	Practice	201	De grote dochter denkt dat de vader een boek schrijft en de moeder niet.
194	Practice	202	Welke directeur vindt dat de musicus vriendelijk is en het zanger ook?
195	Practice	203	De prinses gelooft dat de jonge prins elegant is en de oude prins ook.
196	Practice	204	Wie denk je dat de koeien voeren?
197	Practice	205	De journalist denkt dat de prins een biertje drinkt en prinses de niet.
198	Practice	206	Wie wil met de koning dansen en niet met de minister?
199	Practice	207	Wat denk je wie de piloot liefheeft?
200	Practice	208	De redacteur denkt dat de auteur in Amsterdam werkt en de fotograaf in Brussel.

APPENDIX D: PARTICIPANT INSTRUCTIONS PROCESSING AND COMPREHENSION STUDY

Je zult in dit experiment zinnen lezen. De zinnen worden woord-voor-woord gepresenteerd. Je bepaalt zelf wanneer je het volgende woord leest door op de spatiebalk te klikken. Je krijgt twee blokken á 48 zinnen in totaal.[21]

Sommige zinnen zijn grammaticaal incorrect. Na elke zin verschijnt er het woord GOED? op het scherm. Klik op de Y-toets voor JA en de N-toets voor NEE. Je hebt twee seconden tijd om te reageren. Reageer zo snel mogelijk.[22]

Voordat het experiment begint, is er een oefensessie. Je krijgt een melding als je te langzaam reageert. Lees aandachtig, maar zo snel mogelijk. Reageer zo snel je kunt. Plaats beide handen op het toetsenbord: Wijsvingers op de spatiebalk. Linker middelvinger op de Y-toets en rechter middelvinder op de N-toets. Verander de positie van je handen niet tijdens het experiment en gebruik bij het lezen altijd dezelfde hand en dezelfde vinger.[23]

Let op: Klik op de spatiebalk om de woorden te kunnen lezen en lees zo snel mogelijk![24]

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[21] You will read sentences in this experiment. The sentences are presented word-for-word. You decide when to read the next word by clicking on the space bar. You will get two blocks á 48 sentences in total.

[22] Some sentences are grammatically incorrect. After each sentence, the word GOOD? appears on the screen. Click the *Y* button for *YES* and the *N* button for *NO*. You have two seconds to respond. Respond as quickly as possible.

[23] Before the experiment starts, there is a practice session. You will be notified if you respond too slowly. Read carefully, but as quickly as possible. Respond as quickly as you can. Place both hands on the keyboard: Index fingers on the space bar. Left middle finger on the *Y* key and right middle finger on the *N* key. Do not change the position of your hands during the experiment and always use the same hand and finger when reading.

[24] Note: Click the space bar to read the words and read as fast as possible!

APPENDIX E: ITEMS PRODUCTION STUDY

Test items

no.	condition	set	item	item suffix
1	SUP	1	De minister kent twee priesters. Van deze twee priesters is de lieve priester het	. (emotioneel)
2	SUP	2	De patiënt heeft drie appels. Van deze drie appels is de wilde appel het	. (natuurlijk)
3	SUP	3	De journalist hoort vier sprekers. Van deze vier sprekers is de laatste spreker het	. (negatief)
4	SUP	4	De officier heeft twee kamers. Van deze twee kamers is de nieuwe kamer het	. (persoonlijk)
5	SUP	5	De specialist kent drie dokters. Van deze drie dokters is de oude dokter het	. (intelligent)
6	SUP	6	De grootvader ziet vijf foto's. Van deze vijf foto's is de vierde foto het	. (opmerkelijk)
7	SUP	7	De kapitein kent drie vissers. Van deze drie vissers is de grote visser het	. (ongelukkig)
8	SUP	8	De grootmoeder hoort drie moeders. Van deze drie moeders is de luide moeder het	. (agressief)
9	SUP	9	De studie heeft vier fases. Van deze vier fases is de derde fase het	. (intensief)
10	SUP	10	De criticus kent twee auteurs. Van deze twee auteurs is de jonge auteur het	. (creatief)
11	SUP	11	De professor organiseert drie acties. Van deze drie acties is de laatste actie het	. (origineel)
12	SUP	12	De grootvader kent twee vaders. Van deze twee vaders is de rijke vader het	. (sympathiek)
13	VC	13	Ik ken een student en een professor. Ik denk dat van deze twee de student gisteren	. (gedroomd)
14	VC	14	Zij ziet een jongen en een grootvader. Zij denkt dat van deze twee de jongen gisteren	. (gehuild)
15	VC	15	Hij hoort een dame en een minister. Hij gelooft dat van deze twee de dame gisteren	. (gedanst)
16	VC	16	Ik hoor een vader en een grootvader. Ik denk dat van deze twee de vader gisteren	. (geslapen)
17	VC	17	Zij kent een koning en een minister. Zij gelooft dat van deze twee de koning gisteren	. (gedronken)
18	VC	18	Hij kent een soldaat en een officier. Hij gelooft dat van deze twee de soldaat gisteren	. (gezongen)
19	VC	19	Ik ken twee dokters en een specialist. Ik geloof dat van deze drie de dokters gisteren	. (geantwoord)
20	VC	20	Zij kent drie auteurs en een criticus. Zij denkt dat van deze vier de auteurs gisteren	. (gestudeerd)
21	VC	21	Hij ziet vier dokters en een patiënt. Hij denk dat van deze vijf de dokters gisteren	. (gelachen)
22	VC	22	Ik hoor twee sprekers en een journalist. Ik geloof dat van deze drie de sprekers gisteren	. (gelogen)
23	VC	23	Zij hoort drie vissers en een kapitein. Zij gelooft dat van deze vier de vissers gisteren	. (gezwommen)
24	VC	24	Hij ziet vier moeders en een grootmoeder. Hij denkt dat van deze vijf de moeders gisteren	. (gebakken)

Distractor Items

no.	condition	set	item	item suffix
25	LD	26	Wie denk je dat de mensen	? (gezien)
26	PM	26	Wat denk je wie de mensen	? (gezien)
27	LD	27	Wie denk je dat de ministers	? (geëvalueerd)
28	PM	27	Wat denk je wie de ministers	? (geëvalueerd)
29	LD	28	Wie denk je dat de zangers	? (gehoord)
30	PM	28	Wat denk je wie de zangers	? (gehoord)
31	LD	29	Wie denk je dat de studenten	? (geholpen)
32	PM	29	Wat denk je wie de studenten	? (geholpen)
33	LD	30	Wie denk je dat de auteurs	? (gemotiveerd)
34	PM	30	Wat denk je wie de auteurs	? (gemotiveerd)
35	LD	31	Wie denk je dat de kapiteins	? (gevolgd)
36	PM	31	Wat denk je wie de kapiteins	? (gevolgd)
37	LD	32	Wie denk je dat de vaders	? (gesproken)
38	PM	32	Wat denk je wie de vaders	? (gesproken)
39	LD	33	Wie denk je dat de moeders	? (gezocht)
40	PM	33	Wat denk je wie de moeders	? (gezocht)
41	LD	34	Wie denk je dat de dokters	? (gelooft)
42	PM	34	Wat denk je wie de dokters	? (gelooft)
43	LD	35	Wie denk je dat de dansers	? (gemaild)
44	PM	35	Wat denk je wie de dansers	? (gemaild)
45	LD	36	Wie denk je dat de officiers	? (gekust)
46	PM	36	Wat denk je wie de officiers	? (gekust)
47	LD	37	Wie denk je dat de managers	? (gekend)
48	PM	37	Wat denk je wie de managers	? (gekend)
49	LD	38	Wie denk je dat de dochters	? (geschreven)
50	PM	38	Wat denk je wie de dochters	? (geschreven)
51	LD	39	Wie denk je dat de prinsessen	? (gehaat)
52	PM	39	Wat denk je wie de prinsessen	? (gehaat)
53	LD	40	Wie denk je dat de koningen	? (geaccepteerd)
54	PM	40	Wat denk je wie de koningen	? (geaccepteerd)
55	LD	41	Wie denk je dat de prinsen	? (gedankt)
56	PM	41	Wat denk je wie de prinsen	? (gedankt)
57	LD	42	Wie denk je dat de priesters	? (gerespecteerd)
58	PM	42	Wat denk je wie de priesters	? (gerespecteerd)
59	LD	43	Wie denk je dat de piloten	? (geïnformeerd)
60	PM	43	Wat denk je wie de piloten	? (geïnformeerd)
61	LD	44	Wie denk je dat de inspecteurs	? (gecontacteerd)
62	PM	44	Wat denk je wie de inspecteurs	? (gecontacteerd)
63	LD	45	Wie denk je dat de professors	? (geprovoceerd)
64	PM	45	Wat denk je wie de professors	? (geprovoceerd)
65	LD	46	Wie denk je dat de passagiers	? (geslagen)
66	PM	46	Wat denk je wie de passagiers	? (geslagen)
67	LD	47	Wie denk je dat de vissers	? (gegroet)
68	PM	47	Wat denk je wie de vissers	? (gegroet)
69	LD	48	Wie denk je dat de soldaten	? (verstaan)
70	PM	48	Wat denk je wie de soldaten	? (verstaan)
71	LD	49	Wie denk je dat de jongens	? (gemist)
72	PM	49	Wat denk je wie de jongens	? (gemist)

Filler items

no.	condition	set	item	item suffix
73	Filler	101	Ik denk dat de auteur op dit moment aan de tekst	. (werken)
74	Filler	102	Ik geloof dat de priester op dit moment op de koning	. (wachten)
75	Filler	103	Zij denkt dat de visser op dit moment aan de vis	. (denken)
76	Filler	104	Zij gelooft dat de moeder op dit moment naar de hond	. (zoeken)
77	Filler	105	Hij denkt dat de patiënt op dit moment om de clown	. (lachen)
78	Filler	106	Hij gelooft dat de vader op dit moment naar de muziek	. (luisteren)
79	Filler	107	Ik denk dat de hond iedere dag op de markt	. (liggen)
80	Filler	108	Zij denkt dat de muis iedere dag op de tafel	. (zitten)
81	Filler	109	Hij denkt dat de danser iedere dag op straat	. (dansen)
82	Filler	110	De nieuwe en de oude dokter zijn allebei	. (vriendelijk)
83	Filler	111	De jonge en de oude patiënt zijn allebei	. (gelukkig)
84	Filler	112	De korte en de lange tekst zijn allebei	. (complex)
85	Filler	113	Ik ken vier jonge dansers. De jonge dansers zijn allemaal	. (creatief)
86	Filler	114	Ik ken drie oude koningen. De oude koningen zijn allemaal	. (rijk)
87	Filler	115	De foto's zijn allemaal	. (interessant)
88	Filler	116	De ministers zijn allemaal	. (sympathiek)
89	Filler	117	Ik ken een piloot. Wie heeft de piloot in de hal	? (groeten)
90	Filler	118	Zij kent een priester. Wie heeft de priester in de kerk	? (danken)
91	Filler	119	Ik hoor een bakker. Wat heeft de bakker op de tafel	? (leggen)
92	Filler	120	Hij hoort een student. Wat heeft de student in de school	? (zoeken)
93	Filler	121	Welke kat heeft de vader in de kamer	? (zien)
94	Filler	122	Welke zanger heeft de musicus in de hal	? (horen)
95	Filler	123	De patiënt kent twee jonge dokters en de specialist kent drie	. (oud)
96	Filler	124	De moeder eet drie groene appels en de grootmoeder eet twee	. (rood)
97	Filler	125	De vader schrijft een korte tekst en de grootvader schrijft een	. (lang)
98	Filler	126	De student spreekt over een oninteressante tekst en de professor spreekt over een	. (interessant)
99	Filler	127	De dame danst met een onvriendelijke minister en de barones danst met een	. (vriendelijk)
100	Filler	128	De auteur luistert naar een inactieve discussie en de journalist luistert naar een	. (actief)
101	Filler	129	Wie kent de pianist die de zanger in de hal	? (kussen)
102	Filler	130	Wie kent de bakker die de moeder op de markt	? (zien)
103	Filler	131	Wie kent de student die de professor op de straat	? (groeten)
104	Filler	132	Wie kent de koning die de minister in de kamer	? (horen)

Practice items

no.	condition	set	item	item suffix
105	Practice	201	Ik ken twee prinsen. De jonge prins is dik en de oude prins is	. (groot)
106	Practice	202	De muis zit op de tafel. Denk je dat de kat ook op de	? (zitten)
107	Practice	203	Ik denk dat de professor op dit moment met de student	. (spreken)
108	Practice	204	Wie kent de passagier die de piloot in de hal	? (danken)
109	Practice	205	De vader ziet een witte kat en de moeder ziet een	. (bruin)
110	Practice	206	Zij gelooft dat de priester iedere dag in de kerk	. (zingen)

APPENDIX F: PARTICIPANT INSTRUCTIONS PRODUCTION STUDY

Je zult in dit experiment zinnen lezen. De zinnen zijn niet compleet. Er missen één of twee woorden. Maak de zin op een grammaticale manier af. Gebruik hiervoor altijd het woord dat tussen haakjes staat. Soms moet je het woord aanpassen, soms niet. Soms heb je een tweede woord nodig, soms niet.[25]

Voordat het experiment begint, is er een oefensessie. Je krijgt een mogelijke oplossing te zien. Lees aandachtig, maar zo snel mogelijk. Vul zo snel je kunt één of twee woorden in om de zin compleet te maken.[26]

Let op: Vul zo snel je kunt één of twee woorden in.[27]

[25] You will read sentences in this experiment. The sentences are not complete. One or two words are missing. Complete the sentence grammatically. To do this, always use the word that is in brackets. Sometimes you need to change the word, sometimes not. Sometimes you need a second word, sometimes not.
[26] Before the experiment begins, there is a practice session. You are shown a possible solution. Read carefully, but as quickly as possible. Fill in one or two words as quickly as you can to complete the sentence.
[27] Note: Fill in one or two words as fast as you can.

SUMMARY

Learners of a third language (L3) may show transfer from their first language (L1) and second language (L2). The L3 is a language learned after the L1 and L2, i.e., the first foreign language learned. Transfer can be defined as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). It is assumed that the extent to which the L3 is influenced by the L1 and L2 depends on various factors, such as *typological proximity* (i.e., objective linguistic distance), *psychotypological proximity* (i.e., subjective linguistic distance), *structural proximity*, *L2 status*, *L2 proficiency*, and *L3 proficiency*, as well as *construction frequency in the L3*, to name a few. Over the last two decades, considerable research has been conducted on the factors influencing transfer from the L1 and L2 into the L3, particularly in the area of morphosyntax. This research has led to the development of various models of L3 morphosyntactic transfer, each predicting different transfer patterns in L3 acquisition. The question of which transfer factor predominates, as well as which transfer model best predicts morphosyntactic transfer in L3 acquisition, remains a topic of debate and investigation.

In the literature, four possibilities of morphosyntactic transfer into the L3 have been discussed: no transfer, L1 transfer, L2 transfer, and L1 and/or L2 transfer. For the first two scenarios, no transfer models have been formulated so far. However, L1 transfer is partially supported by data. For the two scenarios L2 transfer, and L1 and/or L2 transfer, various models of L3 morphosyntactic transfer have been formulated. This dissertation tests two such transfer models, which have received the most attention in the literature so far, namely the L2 Status Factor Hypothesis, which advocates for L2 transfer (Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011), and the Typological Primacy Model, which advocates for either L1 or L2 transfer, depending on the typological proximity between the languages in question (Rothman, 2011, 2015). According to the L2 Status Factor Hypothesis, German-speaking learners of L3 Dutch with L2 English would show transfer from L2 English into L3 Dutch, while English-speaking learners of L3 Dutch with L2 German would show transfer from L2 German into L3 Dutch. According to the Typological Primacy Model, on the other hand, the two groups of

learners of L3 Dutch would show transfer into the L3 from either L1 German or English, respectively, or L2 English or German, respectively. Whether the L1 or L2 acts as the source of transfer into the L3 depends on the typological proximity between the L1, L2, and L3 (Rothman, 2013, 2015). Given that German is generally closer to Dutch than English is to Dutch, it can be assumed that German-speaking learners of L3 Dutch with L2 English exhibit transfer from their L1 German into L3 Dutch, and that English-speaking learners of L3 Dutch with L2 German exhibit transfer from their L2 German into L3 Dutch.

The overarching research question of this dissertation aims to determine which factor, typological proximity (Typological Primacy Model) or L2 status (L2 Status Factor Hypothesis), predominates in morphosyntactic transfer between closely related languages (German/English/Dutch) in L3 acquisition. We are also interested in what perception German-speaking and English-speaking learners of L3 Dutch have of the objective typological proximity between Dutch, German, and English, and whether this perception matches the typological proximity between the three languages. Furthermore, we aim to identify to what extent different linguistic properties (superlatives and two-verb clusters) are affected in morphosyntactic transfer into the L3, and what differences emerge in language processing and comprehension, on the one hand, and language production, on the other. Finally, we want to determine to what extent morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and the L2. This dissertation answers these questions through questionnaires and various experimental tasks (grammaticality judgement task, self-paced reading task, sentence completion task).

Chapter 2 contains the theoretical background for this dissertation. We provide general information about morphosyntactic transfer in L3 acquisition by comparing L3 acquisition versus L2 acquisition as well as transfer into L3 versus transfer into L2. Furthermore, we discuss models of L3 morphosyntactic transfer, namely L1 transfer (no formal model proposed), the L2 Status Factor Hypothesis (Bardel & Falk, 2007; Falk & Bardel, 2011), the Cumulative Enhancement Model (Flynn et al., 2004), the Typological Primacy Model (Rothman, 2011, 2015), the Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), and the Scalpel Model (Slabakova, 2017). Finally, we illustrate the international status of Dutch as a foreign language and the spread of Dutch as a foreign language in the German and English language areas, and provide an overview of the similarities

and differences between Dutch, German, and English, both in typological and psychotypological terms.

In **Chapter 3**, we discuss the linguistic properties (superlatives and two-verb clusters) that we use to investigate morphosyntactic transfer between Dutch, German, and English. With regard to superlatives and two-verb clusters, Dutch (a) has two optional variants. German (b) and English (c), on the other hand, each allow only one of these.

Superlatives:

(a) Ze denkt dat de wilde appel
de **natuurlijkste/meest natuurlijke** appel van alle appels is.
(b) Sie denkt, dass der wilde Apfel
der **natürlichste/*meist natürliche** Apfel von allen Äpfeln ist.
(c) She thinks that the wild apple
is the ***naturalest/most natural** apple of all apples.

Two-verb clusters:

(a) Ik denk dat de student
gedroomd heeft/heeft gedroomd en de professor niet.
(b) Sie denkt, dass der Student
geträumt hat/*hat geträumt und der Professor nicht.
(c) She thinks that the student
***dreamed has/has dreamed** and the professor has not.

Additionally, in this chapter, we present a description of the selection process for the test items and illustrate how the twelve superlative test items and two-verb cluster test items for the experimental tasks were created based on the *Groningen Twitter Corpus* (Bouma, 2015).

In **Chapter 4**, we present a study on the psychotypological proximity between Dutch, German, and English of German-speaking and English-speaking learners of L3 Dutch. The results show that both groups of learners of L3 Dutch perceive German—generally as well as in syntactic and morphological terms—as closer to Dutch than English is to Dutch. We conclude that the typological proximity and psychotypological proximity between Dutch, German, and English of German-

speaking and English-speaking learners of L3 Dutch coincide, and we can assume that for both groups of learners of L3 Dutch, German is the language that has a stronger influence on Dutch (Rothman, 2011; Slabakova, 2017).

In **Chapter 5**, we present a study on morphosyntactic transfer into the L3 in language processing and comprehension for German-speaking learners of L3 Dutch with L2 English and English-speaking learners of L3 Dutch with L2 German. In this study, we used a grammaticality judgement task and a self-paced reading task. The results of processing and comprehending Dutch superlatives and two-verb clusters do not support the L2 Status Factor Hypothesis. The results of the self-paced reading task for superlatives are consistent with the Typological Primacy Model. However, these results could also be explained by alternative factors and models of L3 morphosyntactic transfer.

In **Chapter 6**, we present a study on morphosyntactic transfer into the L3 in language production for the same groups of learners of L3 Dutch. In this study, we used a sentence completion task. The results for the production of Dutch superlatives and two-verb clusters do not support the L2 Status Factor Hypothesis. The results of the sentence completion task for superlatives are consistent with the Typological Primacy Model. However, these results cannot solely be explained by the Typological Primacy Model.

In **Chapter 7**, we discuss the findings of this dissertation in relation to different factors and models of L3 morphosyntactic transfer and provide answers to our research questions. Neither the Typological Primacy Model nor the L2 Status Factor Hypothesis provides a good prediction for our data on morphosyntactic transfer between the closely related languages German, English, and Dutch in L3 acquisition. It appears that factors other than typological proximity or L2 status play a role in morphosyntactic transfer into the L3, especially when both the L1 and L2 are closely related to the L3. We show that these factors could include construction frequency in the L3, language instruction, L2 and L3 proficiency, and language activation and use. This points towards the Scalpel Model (Slabakova, 2017), which suggests that all previously learned languages are equally available for transfer when learning a new language, and that besides structural proximity, other factors also play a role in morphosyntactic transfer into the L3. Furthermore, we find different transfer patterns for superlatives and two-verb clusters in the self-paced reading task and the sentence completion task, supporting the concept of property-by-property transfer, i.e., transfer of individual linguistic properties, rather than wholesale transfer, i.e., transfer of one grammar (L1 or L2) as a block (Puig-

Mayenco et al., 2020; Schwartz & Sprouse, 2021). Moreover, our data generally show no differences between morphosyntactic transfer into the L3 in language processing and comprehension, on the one hand, and language production, on the other; nor did we find evidence that morphosyntactic transfer into the L3 is influenced by language proficiency in the L3 and L2. Finally, we discuss methodological implications for future research, followed by pedagogical implications for teaching Dutch as an L3 in German and English-speaking areas.

SAMENVATTING

Leerders van een derde taal (L3) kunnen transfer vertonen van hun eerste taal (L1) en tweede taal (L2). De L3 is een taal die geleerd wordt na de L1 en de L2, d.w.z. de eerste vreemde taal die wordt geleerd. Transfer wordt gedefinieerd als "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). Er wordt aangenomen dat de mate waarin de L3 wordt beïnvloed door de L1 en de L2 afhangt van verschillende factoren, zoals *typologische afstand* (d.w.z. objectieve taalafstand), *psychotypologische afstand* (d.w.z. subjectieve taalafstand), *structurele afstand*, *L2-status*, *L2-vaardigheid* en *L3-vaardigheid*, en *constructiefrequentie in de L3*, om er maar een paar te noemen. De laatste twee decennia is er veel onderzoek gedaan naar de factoren die transfer van de L1 en de L2 naar de L3 beïnvloeden, vooral op het gebied van morfosyntaxis. Dit onderzoek heeft geleid tot de ontwikkeling van verschillende modellen van L3 morfosyntactische transfer, die elk verschillende transferpatronen in L3-verwerving voorspellen. De vraag welke transferfactor overheerst, evenals welk transfermodel de beste voorspelling doet voor morfosyntactische transfer in L3-verwerving, blijft onderwerp van discussie en onderzoek.

In de literatuur zijn vier mogelijkheden van morfosyntactische transfer naar de L3 besproken: geen transfer, L1 transfer, L2 transfer, en L1 en/of L2 transfer. Voor de eerste twee scenario's zijn er tot nu toe nog geen transfermodellen geformuleerd. Echter, L1 transfer wordt gedeeltelijk ondersteund door data. Voor de scenario's L2 transfer en L1 en/of L2 transfer zijn er verschillende L3 modellen van morfosyntactische transfer geformuleerd. Dit proefschrift test twee van dergelijke transfermodellen, die tot nu toe de meeste aandacht hebben gekregen in de literatuur, namelijk de L2 Status Factor Hypothese, die pleit voor L2 transfer (Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011), en het Typological Primacy Model, dat pleit voor ofwel L1 ofwel L2 transfer, afhankelijk van de typologische afstand tussen de talen in kwestie (Rothman, 2011, 2015). Volgens de L2 Status Factor Hypothese zouden Duitstalige leerders van L3 Nederlands met L2 Engels transfer van L2 Engels naar L3 Nederlands laten zien, terwijl Engelstalige leerders van L3 Nederlands met L2 Duits transfer van L2 Duits naar L3 Nederlands zouden laten zien. Volgens het Typological Primacy Model

daarentegen zouden de twee groepen leerders van L3 Nederlands transfer naar de L3 kunnen vertonen van ofwel L1 Duits of Engels, respectievelijk, ofwel L2 Engels of Duits, respectievelijk. Of de L1 of de L2 wordt gekozen als bron van transfer naar de L3 hangt af van de typologische afstand tussen de L1, L2 en L3 (Rothman, 2013, 2015). Gezien het feit dat het Duits over het algemeen dichter bij het Nederlands staat dan het Engels, kan er worden aangenomen dat Duitstalige leerders van L3 Nederlands met L2 Engels transfer vertonen van hun L1 Duits naar L3 Nederlands, en dat Engelstalige leerders van L3 Nederlands met L2 Duits transfer vertonen van hun L2 Duits naar L3 Nederlands.

De overkoepelende onderzoeksvraag van dit proefschrift heeft tot doel om uit te vinden welke factor, typologische afstand (Typological Primacy Model) of L2 status (L2 Status Factor Hypothese), overheerst in morfosyntactische transfer tussen nauw verwante talen (Duits/Engels/Nederlands) in L3-verwerving. Ook willen we uitvinden welke perceptie Duitstalige en Engelstalige leerders van L3 Nederlands hebben van de typologische afstand tussen Nederlands, Duits en Engels, en of deze waarneming overeenkomt met de objectieve typologische afstand tussen de drie talen. Verder willen we achterhalen of er verschillende transferpatronen te vinden zijn met betrekking tot verschillende linguïstische fenomenen (superlatieven en tweeledige werkwoordclusters) en welke verschillen er zijn in morfosyntactische transfer naar de L3 in taalverwerking en -begrip, aan de ene kant, en taalproductie, aan de andere kant. Tenslotte willen we uitvinden in hoeverre morfosyntactische transfer naar de L3 wordt beïnvloed door taalvaardigheid in de L3 en de L2. Dit proefschrift beantwoordt deze vragen door middel van vragenlijsten en experimentele taken (grammaticaliteitsbeoordelingstaak, self-paced reading taak, zinsaanvultaak).

Hoofdstuk 2 bevat de theoretische achtergrond voor dit proefschrift. We geven algemene informatie over morfosyntactische transfer bij L3-verwerving door L3-verwerving versus L2-verwerving alsook transfer naar de L3 versus transfer naar de L2 met elkaar te vergelijken. Verder bespreken we modellen van L3 morfosyntactische transfer, namelijk L1 transfer (geen formeel model voorgesteld), de L2 Status Factor Hypothese (Bardel & Falk, 2007; Falk & Bardel, 2011), het Cumulative Enhancement Model (Flynn et al., 2004), het Typological Primacy Model (Rothman, 2011, 2015), het Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b), en het Scalpel Model (Slabakova, 2017). Tenslotte illustreren we de internationale status van het Nederlands als vreemde taal en de verspreiding van het Nederlands als vreemde taal in het Duitse en Engelse

taalgebied, en geven een overzicht van de overeenkomsten en verschillen tussen het Nederlands, Duits en Engels, zowel in typologische als in psychotypologische termen.

In **hoofdstuk 3** bespreken we de linguïstische fenomenen (superlatieven en tweeledige werkwoordclusters) die we gebruiken om morfosyntactische transfer tussen het Nederlands, Duits en Engels te onderzoeken. Wat betreft superlatieven en tweeledige werkwoordclusters heeft het Nederlands (a) twee optionele varianten. Het Duits (b) en het Engels (c) laten er telkens maar één daarvan toe.

Superlatieven:

(a) Ze denkt dat de wilde appel
de **natuurlijkste/meest natuurlijke** appel van alle appels is.
(b) Sie denkt, dass der wilde Apfel
der **natürlichste/*meist natürliche** Apfel von allen Äpfeln ist.
(c) She thinks that the wild apple
is the ***naturalest/most natural** apple of all apples.

Tweeledige werkwoordclusters:

(a) Ik denk dat de student
gedroomd heeft/heeft gedroomd en de professor niet.
(b) Sie denkt, dass der Student
geträumt hat/*hat geträumt und der Professor nicht.
(c) She thinks that the student
***dreamed has/has dreamed** and the professor has not.

Daarnaast presenteren we in dit hoofdstuk een beschrijving van het selectieproces van de testitems en illustreren we hoe de twaalf superlatief items en tweeledige werkwoordcluster items voor de experimentele taken zijn gecreëerd op basis van het *Groningen Twitter Corpus* (Bouma, 2015).

In **hoofdstuk 4** presenteren we een studie naar de psychotypologische afstand tussen het Nederlands, Duits en Engels van Duitstalige en Engelstalige leerders van L3 Nederlands. De resultaten laten zien dat beide groepen leerders van L3 Nederlands het Duits – over het algemeen maar ook in syntactisch en morfologisch opzicht – als dichter bij het Nederlands waarnemen dan het Engels. We concluderen

dat de typologische afstand en de psychotypologische afstand tussen het Nederlands, Duits en Engels bij Duitstalige en Engelstalige leerders van L3 Nederlands overeenkomen, en we kunnen aannemen dat bij beide groepen leerders van L3 Nederlands, het Duits de taal is die de sterkere invloed heeft op het Nederlands (Rothman, 2011; Slabakova, 2017).

In **hoofdstuk 5** presenteren we een studie naar morfosyntactische transfer naar de L3 in taalverwerking en -begrip bij Duitstalige leerders van L3 Nederlands met L2 Engels en Engelstalige leerders van L3 Nederlands met L2 Duits. In deze studie hebben we gebruik gemaakt van een grammaticaliteitsbeoordelingstaak en een self-paced reading taak. De resultaten van het verwerken en begrijpen van Nederlandse superlatieven en tweeledige werkwoordclusters ondersteunen de L2 Status Factor Hypothese niet. De resultaten van de self-paced reading taak voor superlatieven zijn in overeenstemming met het Typological Primacy Model. Echter, deze resultaten zouden ook door alternatieve factoren en modellen van L3 morfosyntactische transfer kunnen worden verklaard.

In **hoofdstuk 6** presenteren we een studie naar morfosyntactische transfer naar de L3 in taalproductie bij dezelfde groepen leerders van L3 Nederlands. In deze studie hebben we gebruik gemaakt van een zinsaanvultaak. Ook de resultaten van de productie van Nederlandse superlatieven en tweeledige werkwoordclusters ondersteunen de L2 Status Factor Hypothese niet. De resultaten van de zinsaanvultaak voor superlatieven zijn in overeenstemming met het Typological Primacy Model. Deze resultaten kunnen echter ook hier niet alleen door het Typological Primacy Model worden verklaard.

In **hoofdstuk 7** bespreken we de bevindingen van dit proefschrift in relatie tot verschillende factoren en modellen van L3 morfosyntactische transfer en geven antwoorden op onze onderzoeksvragen. Noch het Typological Primacy Model noch de L2 Status Factor Hypothese geeft een goede voorspelling voor onze data over morfosyntactische transfer tussen de nauw verwante talen Duits, Engels en Nederlands in L3 verwerving. Het lijkt dat andere factoren dan typologische afstand of L2 status een rol spelen bij morfosyntactische transfer naar de L3, vooral als de L1 en de L2 beide nauw verwant zijn aan de L3. We laten zien dat dit factoren kunnen zijn zoals constructiefrequentie in de L3, instructie, L2- en L3-vaardigheid en taalactivering en -gebruik. Dit wijst in de richting van het Scalpel Model (Slabakova, 2017), namelijk zo dat alle eerder geleerde talen in gelijke mate beschikbaar zijn voor transfer bij het leren van een nieuwe taal, en dat naast structurele nabijheid ook andere factoren een rol spelen bij morfosyntactische

transfer naar de L3. Verder vinden we verschillende transferpatronen voor superlatieven en tweeledige werkwoordclusters in de self-paced reading taak en de zinsaanvultaak, waardoor het concept van *property-by-property transfer*, d.w.z. transfer van individuele linguïstische fenomenen, in plaats van *wholesale transfer*, d.w.z. transfer van één grammatica (L1 of L2) als een blok (Puig-Mayenco et al., 2020; Schwartz & Sprouse, 2021) wordt ondersteund. Bovendien vinden we in onze data over het algemeen geen verschillen tussen morfosyntactische transfer naar de L3 in taalverwerking en -begrip, aan de ene kant, en taalproductie, aan de andere kant; en ook geen bewijs ervoor dat morfosyntactische transfer naar de L3 wordt beïnvloed door taalvaardigheid in de L3 en de L2. Tenslotte bespreken we in dit hoofdstuk methodologische implicaties voor toekomstig onderzoek, gevolgd door pedagogische implicaties voor het onderwijs van het Nederlands als L3 in het Duitse en Engels taalgebied.

ZUSAMMENFASSUNG

Lernende einer Drittsprache (L3) können Transfer zwischen ihrer Erstsprache (L1) und ihrer Zweitsprache (L2) aufweisen. Die L3 ist eine Sprache, die nach der L1 und der L2, d.h. der ersten erlernten Fremdsprache, gelernt wird. Transfer wird definiert als "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27). Es wird angenommen, dass das Ausmaß, in dem die L3 von der L1 und der L2 beeinflusst wird, von mehreren Faktoren abhängt, wie zum Beispiel *typologische Distanz* (d. h. objektive Sprachdistanz), *psychotypologische Distanz* (d. h. subjektive Sprachdistanz), *strukturelle Distanz*, *L2-Status*, *L2-Sprachkompetenz* und *L3-Sprachkompetenz*, sowie *Konstruktionshäufigkeit in der L3*, um nur einige zu nennen. In den letzten zwei Jahrzehnten wurde viel zu den Faktoren geforscht, die Transfer von der L1 und der L2 in die L3 beeinflussen, insbesondere im Bereich der Morphosyntax. Diese Forschung hat zur Entwicklung mehrerer Modelle morphosyntaktischen Transfers in der L3 geführt, die jeweils unterschiedliche Transfermuster beim L3-Erwerb vorhersagen. Die Frage, welcher Transferfaktor dominiert und welches Transfermodell morphosyntaktischen Transfer im L3-Erwerb am besten vorhersagt, ist nach wie vor Gegenstand von Diskussion und Forschung.

In der Literatur werden vier Möglichkeiten des morphosyntaktischen Transfers in die L3 diskutiert: kein Transfer, L1 Transfer, L2 Transfer, und L1 Transfer und/oder L2 Transfer. Für die ersten beiden Szenarien sind bisher keine Transfermodelle formuliert worden. L1 Transfer ist jedoch teilweise durch Daten belegt. Für die Szenarien L2 Transfer sowie L1 Transfer und/oder L2 Transfer sind verschiedene Modelle morphosyntaktischen Transfers in der L3 formuliert worden. Diese Dissertation testet zwei solcher Transfermodelle, die in der Literatur bisher die meiste Aufmerksamkeit erhalten haben, nämlich die L2 Status Faktor Hypothese, die für L2 Transfer argumentiert (Williams & Hammarberg, 1998; Bardel & Falk, 2007; Falk & Bardel, 2011), und das Typological Primacy Model, das je nach typologischem Abstand zwischen den betreffenden Sprachen entweder für L1 Transfer oder L2 Transfer argumentiert (Rothman, 2011, 2015). Nach der L2 Status Faktor Hypothese würden deutschsprachige Lernende von L3 Niederländisch mit L2 Englisch Transfer von L2 Englisch in die L3 Niederländisch

zeigen, während englischsprachige Lernende von L3 Niederländisch mit L2 Deutsch Transfer von L2 Deutsch in die L3 Niederländisch zeigen würden. Nach dem Typological Primacy Model hingegen, würden beide Gruppen von Lernenden von L3 Niederländisch Transfer von L1 Deutsch beziehungsweise Englisch oder L2 Englisch beziehungsweise Deutsch in die L3 zeigen. Ob die L1 oder die L2 als Quelle des Transfers in die L3 gewählt wird, hängt von der typologischen Distanz zwischen der L1, L2 und L3 ab (Rothman, 2013, 2015). Da das Deutsche dem Niederländischen im Allgemeinen näher steht als das Englische, kann davon ausgegangen werden, dass deutschsprachige Lernende von L3 Niederländisch mit L2 Englisch Transfer von ihrer L1 Deutsch in die L3 Niederländisch zeigen, und dass englischsprachige Lernende von L3 Niederländisch mit L2 Deutsch Transfer von ihrer L2 Deutsch in die L3 Niederländisch zeigen.

Die zentrale Forschungsfrage dieser Arbeit zielt darauf ab, herauszufinden, welcher Faktor, typologische Distanz (Typological Primacy Model) oder L2-Status (L2 Status Faktor Hypothese), beim morphosyntaktischen Transfer zwischen eng verwandten Sprachen (Deutsch/Englisch/Niederländisch) im L3-Erwerb dominiert. Des Weiteren wollen wir herausfinden, welche Wahrnehmung deutschsprachige und englischsprachige Lernende von L3 Niederländisch von der typologischen Distanz zwischen Niederländisch, Deutsch und Englisch haben und ob diese Wahrnehmung der objektiven typologischen Distanz zwischen den drei Sprachen entspricht. Außerdem wollen wir herausfinden, ob sich unterschiedliche Transfermuster in Bezug auf verschiedene sprachliche Phänomene (Superlative und Zweiverbcluster) finden lassen und welche Unterschiede es beim morphosyntaktischen Transfer in die L3 bei der Sprachverarbeitung und dem Sprachverständnis einerseits und der Sprachproduktion andererseits gibt. Schließlich wollen wir herausfinden, inwieweit morphosyntaktischer Transfer in die L3 von der Sprachkompetenz in der L3 und der L2 beeinflusst wird. Die vorliegende Arbeit beantwortet diese Fragen mit Hilfe von Fragebögen und verschiedenen experimentellen Aufgaben (Grammatikalitätsbeurteilungsaufgabe, Self-Paced Reading Aufgabe, Satzvervollständigungsaufgabe).

Kapitel 2 enthält den theoretischen Hintergrund dieser Dissertation. Wir geben allgemeine Informationen über morphosyntaktischen Transfer beim L3-Erwerb, indem wir L3-Erwerb versus L2-Erwerb sowie Transfer in die L3 versus Transfer in die L2 miteinander vergleichen. Weiterhin diskutieren wir Modelle morphosyntaktischen Transfers in der L3, nämlich L1-Transfer (kein formales Modell vorgeschlagen), die L2-Status Faktor Hypothese (Bardel & Falk, 2007; Falk

& Bardel, 2011), das Cumulative Enhancement Model (Flynn et al., 2004), das Typological Primacy Model (Rothman, 2011, 2015), das Linguistic Proximity Model (Westergaard et al., 2017; Westergaard 2021a, 2021b) und das Scalpel Model (Slabakova, 2017). Schließlich illustrieren wir den internationalen Status des Niederländischen als Fremdsprache und die Verbreitung des Niederländischen als Fremdsprache im deutschen und englischen Sprachraum und geben einen Überblick über die Gemeinsamkeiten und Unterschiede zwischen dem Niederländischen, Deutschen und Englischen, sowohl in typologischer als auch in psychotypologischer Hinsicht.

In **Kapitel 3** besprechen wir die linguistischen Phänomene (Superlative und Zweiverbcluster), die wir verwenden, um morphosyntaktischen Transfer zwischen dem Niederländischen, Deutschen und Englischen zu untersuchen. Bezüglich der Superlative und Zweiverbcluster hat das Niederländische (a) zwei optionale Varianten. Das Deutsche (b) und das Englische (c) erlauben jeweils nur eine davon.

Superlative:

(a) Ze denkt dat de wilde appel
de **natuurlijkste/meest natuurlijke** appel van alle appels is.
(b) Sie denkt, dass der wilde Apfel
der **natürlichste/*meist natürliche** Apfel von allen Äpfeln ist.
(c) She thinks that the wild apple
is the ***naturalest/most natural** apple of all apples.

Zweiverbclusters:

(a) Ik denk dat de student
gedroomd heeft/heeft gedroomd en de professor niet.
(b) Sie denkt, dass der Student
geträumt hat/*hat geträumt und der Professor nicht.
(c) She thinks that the student
***dreamed has/has dreamed** and the professor has not.

Außerdem präsentieren wir in diesem Kapitel eine Beschreibung des Auswahlprozesses der Testitems und veranschaulichen, wie die zwölf Superlativ-

Testitems und Zweiverbcluster-Testitems für die experimentellen Aufgaben auf der Grundlage des Groningen Twitter Corpus (Bouma, 2015) erstellt wurden.

In **Kapitel 4** präsentieren wir eine Studie zur psychotypologischen Distanz zwischen dem Niederländischen, Deutschen und Englischen bei deutschsprachigen und englischsprachigen Lernenden von L3 Niederländisch. Die Ergebnisse zeigen, dass beide Gruppen von Lernenden von L3 Niederländisch das Deutsche – sowohl im Allgemeinen als auch in syntaktischer und morphologischer Hinsicht – als näher am Niederländischen wahrnehmen als das Englische. Wir schließen daraus, dass die typologische Distanz und die psychotypologische Distanz zwischen dem Niederländischen, Deutschen und Englischen bei deutschsprachigen und englischsprachigen Lernenden von L3 Niederländisch übereinstimmen, und wir können annehmen, dass bei beiden Gruppen von Lernenden von L3 Niederländisch das Deutsche die Sprache ist, die den stärkeren Einfluss auf das Niederländische hat (Rothman, 2011; Slabakova, 2017).

In **Kapitel 5** präsentieren wir eine Studie zum morphosyntaktischen Transfer in die L3 bei Sprachverarbeitung und -verständnis bei deutschsprachigen Lernenden von L3 Niederländisch mit L2 Englisch und englischsprachigen Lernenden von L3 Niederländisch mit L2 Deutsch. In dieser Studie haben wir eine Grammatikalitätsbeurteilungsaufgabe und eine Self-Paced Reading Aufgabe verwendet. Die Ergebnisse der Verarbeitung und des Verständnisses niederländischer Superlative und Zweiverbcluster unterstützen die L2 Status Faktor Hypothese nicht. Die Ergebnisse der Self-Paced Reading Aufgabe für Superlative stimmen mit dem Typological Primacy Model überein. Allerdings könnten diese Ergebnisse auch durch alternative Faktoren und Modelle morphosyntaktischen Transfers in der L3 erklärt werden.

In **Kapitel 6** präsentieren wir eine Studie zum morphosyntaktischen Transfer in die L3 bei Sprachproduktion bei denselben Gruppen von Lernenden von L3 Niederländisch. In dieser Studie haben wir eine Satzvervollständigungsaufgabe verwendet. Auch die Ergebnisse der Produktion niederländischer Superlative und Zweiverbcluster unterstützen die L2 Status Faktor Hypothese nicht. Die Ergebnisse der Satzvervollständigungsaufgabe für Superlative stimmen mit dem Typological Primacy Model überein. Diese Ergebnisse können jedoch auch hier nicht allein durch das Typological Primacy Model erklärt werden.

In **Kapitel 7** diskutieren wir die Ergebnisse dieser Dissertation in Bezug auf verschiedene Faktoren und Modelle morphosyntaktischen Transfers in der L3 und geben Antworten auf unsere Forschungsfragen. Weder das Typological Primacy

Model noch die L2 Status Faktor Hypothese liefert eine gute Vorhersage für unsere Daten zum morphosyntaktischen Transfer zwischen den eng verwandten Sprachen Deutsch, Englisch und Niederländisch im L3-Erwerb. Es scheint, dass andere Faktoren als die typologische Distanz oder der L2-Status eine Rolle beim morphosyntaktischen Transfer in die L3 spielen, insbesondere wenn die L1 und die L2 beide eng mit der L3 verwandt sind. Wir zeigen, dass dies Faktoren wie Konstruktionshäufigkeit in der L3, Instruktion, L2-Kompetenz und L3-Kompetenz, sowie Sprachaktivierung und -gebrauch sein können. Dies deutet auf das Scalpel Model (Slabakova, 2017) hin, nämlich dass alle zuvor gelernten Sprachen in gleichem Maße für Transfer beim Erlernen einer neuen Sprache verfügbar sind und dass neben struktureller Nähe auch andere Faktoren eine Rolle bei morphosyntaktischem Transfer in die L3 spielen. Außerdem finden wir unterschiedliche Transfermuster für Superlative und Zweiverbcluster in der Self-Paced Reading Aufgabe und der Satzvervollständigungsaufgabe, was das Konzept *property-by-property transfer* unterstützt, d.h. Transfer einzelner linguistischer Phänomene, anstelle von *wholesale transfer*, d.h. Transfer einer Grammatik (L1 oder L2) als Ganzes (Puig-Mayenco et al., 2020; Schwartz & Sprouse, 2021). Darüber hinaus finden wir in unseren Daten im Allgemeinen keine Unterschiede zwischen morphosyntaktischem Transfer in die L3 bei Sprachverarbeitung und Sprachverständnis einerseits und Sprachproduktion andererseits und auch keine Hinweise darauf, dass morphosyntaktischer Transfer in die L3 durch Sprachkompetenzen in der L3 und L2 beeinflusst wird. Schließlich diskutieren wir in diesem Kapitel methodologische Implikationen für zukünftige Forschung sowie pädagogische Implikationen für den Unterricht des Niederländischen als L3 im deutschen und englischen Sprachraum.

CURRICULUM VITAE

Andreas Hiemstra was born on August 19, 1986, in Norden, Germany, and holds both German and Dutch citizenship. After completing secondary school in 2003, he trained and worked as an administrative assistant at the Emden city council. In 2008, he pursued his A-levels at Oldenburg Kolleg, obtaining them in 2011. The following year, he worked as a sales assistant at ESPRIT Retail in Oldenburg and attended Wimbledon School of English in London during the summer. He then continued his education at the University of Oldenburg, studying Dutch Studies, English Studies, and Biology, and received a Bachelor's degree in 2016, followed by a Master of Education degree in 2019. He spent semesters abroad at the University of Stirling in Scotland (2015) and the University of Ghent in Belgium (2017/2018). From 2019 to 2024, he worked as a research assistant at the Institute of Dutch Studies, University of Oldenburg while being a Double-Degree PhD student at both the Institute of Dutch Studies, University of Oldenburg, and the division Proficiency European Languages and Cultures, University of Groningen, the Netherlands. In 2022, he spent two months as a visiting PhD student at the University of Groningen and, in 2023, two months at the University of Sheffield, United Kingdom. This dissertation is the result of his PhD research, supervised by Prof. dr. Esther Ruigendijk, Prof. dr. Marije Michel, Dr. Ankelien Schippers, and Dr. Greg Poarch. Currently, Andreas Hiemstra works as a study coordinator at the School of Mathematics and Science at the University of Oldenburg.