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Cross-Linguistic Influence in Third Language Acquisition

A longitudinal study on the acquisition of German morphosyntax by Norwegian high school students

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1 Introduction

This thesis aims to investigate how previously acquired languages influence the acquisition of a third language (L3); modes of transfer/cross-linguistic influence[1] (CLI) (wholesale vs. property-by-property) and factors that select the source of transfer. This longitudinal empirical study contributes to the core questions of generative adult language acquisition and adds to the current discussion on how previously acquired languages influence the acquisition of morphosyntactic properties in the L3 (e.g., Bardel, C., & Falk, Y. 2007, Rothman 2015, Westergaard, Mitrofanova, N., Mykhaylyk, R., & Rodina, Y. 2017, Westergaard 2019).

Several models have been proposed to explain CLI on the acquisition of a third language. They are often distinguished by the different factors that have been found to lead to CLI in L3 acquisition (L3A), e.g., structural similarity, typology, frequency of language use and order of acquisition. The L3 models also differ regarding their predictions for the extent of transfer in the interlanguage of the L3. Interlanguage is the temporary and evolving linguistic system used by learners in the process of acquiring a second, third and beyond language. Does transfer happen in one fell swoop (Westergaard, 2023) that is to say, is the beginning of the L3 grammar a copy of a previously acquired grammar or is the interlanguage grammar of the L3 built gradually in a piece-meal fashion (Westergaard, 2019). The availability of multiple sources of CLI is also what sets L3A apart from second language acquisition (L2A). In L2A there is only one possible source for cross-linguistic influence, i.e., the first language (L1), while in the acquisition of L3 there is the possibility for cross-linguistic influence from L1, L2 or both the L1 and the L2. The four logical possibilities that are typically considered in this context and presented by Jorge Gonzalez Alonso in the Cambridge Handbook of Third Language Acquisition (2023) are:

"1. There is no transfer from previous languages.

[1] I use the terms transfer and cross-linguistic influence interchangeably to refer to systematic influence of a previous language on the L3; see e.g., Westergaard (2021).

2. Transfer comes predominantly or exclusively from the L1.

3. Transfer comes predominantly or exclusively from the L2.

4. Transfer can come from either, or both, the L1 and/or the L2." (p.1950)

To date, there is no study with empirical data to support the first logical possibility. There are studies discussing and showing empirical data for possibilities 2, 3, and 4. For example, the L1 Transfer model (e.g., Jin 2009, Na Ranong & Leung 2009, Hermas 2015) argues that transfer comes predominantly from the L1, while the L2 Status Factor model (L2SF) by Bardel & Falk (2007) argues that transfer comes predominantly from the L2. Both these models suggest that order of acquisition is the principal factor for CLI. The Language of Communication Model (Fallah, Jabbari & Fazilatfar 2016) argues that not order of acquisition determines the predominant source of transfer in L3 acquisition, but rather the language which is dominantly used in the learner's daily life determines the principal source of transfer. Also, the Typological Primacy Model (TPM) (Rothman 2011) rejects the hypothesis that order of acquisition is the main factor of CLI. The TPM proposes that the previously acquired language which is typologically more like the L3 is the exclusive source for transfer. The argument that the parser selects one of the previously learned languages and copies the entirety of that particular language's grammar as a blueprint for the initial interlanguage grammar of the "new" language (i.e., L3, Ln) while suppressing linguistic information of any other previously learned languages is unique to the TPM. This notion of wholesale transfer is not supported by the other previously mentioned models which rather propose that one of the languages is more important than the other. Other models, like the Linguistic Proximity Model (LPM) of Westergaard et al. (2017, 2023), the Scalpel model of Slabakova (2017) and the Cumulative Enhancement Model (CEM; Flynn, Foley & Vinnitskaya 2004; Berkes & Flynn 2012), on the other hand, propose that both previously learned languages are co-activated and can both influence L3 acquisition at all stages. Transfer is not wholesale, but rather proceeds property-by-property. The parser maintains access to all previous linguistic knowledge during the construction of a new interlanguage grammar. These models propose that it is advantageous and more economical for the parser to maintain access to all available linguistic information which might contribute to the acquisition of the L3/Ln grammar. To suppress an entire language's grammar for the sake of wholesale transfer of a sole source in

this light seems inconvenient and a taxing option. The notion of full transfer potential (Westergaard 2021, Westergaard et al. 2023) suggests that the parser retains access to all previously learned languages and continuously evaluates (property-by-property) how to use the already available linguistic knowledge to assist in the parsing and constructing the L3/Ln interlanguage grammar. In-line with these models that propose piecemeal, property-by-property transfer is also a recent study by Busterud, et al. (2023). This study adds economy as a potential factor for cross-linguistic influence. Economy pertains here to language specific underlying syntactic operations. Underlying syntactic operations can be more costly in one language and less costly in another language. The authors (Busterud et al., 2023) propose that the source of cross-linguistic influence is prompted by language specific markedness of individual structures. The source of CLI is thereafter the language with the least marked underlying structure. In this proposal economy is the determining factor for CLI. Following this assumption then transfer must also occur structure-by structure and not wholesale. The findings of the current study align with this proposal.

All models have found empirical data to support their hypotheses. More empirical evidence is necessary to understand how previous linguistic knowledge influences the acquisition of an L3/Ln.

Cross-linguistic influence is a broad topic. In this thesis, I focus on cross-linguistic influence during the acquisition of morphosyntactic structures such as word order in sentences with habitual adverbs and non-subject initial declaratives in L3 German by L1 Norwegian, L2 English speakers. Both these structures require the finite verb to move to the second constituent position in German and Norwegian while English doesn't require the verb to move to the second position (across the adverb in the first case, and across the subject in the second case). As the morphosyntactic structures under investigation are a linguistic match between the L1 and the L3, transfer from the L1 would result in facilitation and the learners are expected to use both structures in a target-like manner (such result would support models that argue for a privileged role of the L1 as the primary source of CLI, see Jin 2009, Na Ranong & Leung 2009, Hermas 2015)). Target-like performance (or at least very high accuracy) would also support the TPM (Rothman 2015), as Norwegian and German are defined as typologically more similar than English and German and The Language of Communication Model (Fallah, Jabbari & Fazilatfar 2016), as Norwegian is the dominant

language of communication for the participants of the current study. Non-target-like use of both structures could be in-line with the prediction of models arguing for transfer from the L2. The linguistic mismatch between L3 and L2 overt in both structures under investigation would result in non-facilitation and non-target like responses. Non-target like performance would support the L2SF model (Bardel & Falk 2007) in their proposed notion that the L2 will be the predominant source of transfer during L3 acquisition. CLI from the L2 might however also be due to other factors than order of acquisition, for example, economy. The structures under investigation are least marked in the L2, meaning that copying these for the construction of the L3 interlanguage is the most economical option for the parser. If the learners do not show a clear preference for either V2 order (target-like) or V3 (non-target like) word order in L3 German, there may be no evidence for wholesale or predominant transfer at the initial stages.

Furthermore, assessing the developmental trajectory of the two structures could provide support for either the notion of wholesale or property-by-property transfer. Both L1 Norwegian and L3 German are V2 languages and both the structures under investigation require verb movement in these languages. L2 English on the other hand requires the finite verb to stay in-situ in these two structures. Even though the properties of the two structures are very similar, they are different. Sentences with habitual adverbs do not require the verb to move across the subject in Norwegian and German, while non-subject initial declaratives do. The LPM (Westergaard et al., 2017, 2023) and the SM (Slabakova, 2017) and the notion that the parser applies linguistic knowledge property-by-property is supported if the acquisition of the two structures does not correlate in its development trajectory towards target-like performance i.e., participants judge one of the two structures more target-like than the other. This may suggest that the parser evaluates sources of transfer property-by-property in the L3 acquisition process. Conversely, if the trajectory of both structures under investigation is found to be the same, we could theorize that this would support wholesale transfer.

The comparison of the results of this study's participant group to a group with mirrored language pairings i.e., L1 English, L2 Norwegian, L3 German could be used to test the Cumulative Input Threshold Hypothesis (CITH) (Cabrelli and Iverson, 2020). The CITH proposes that at later stages of L3A it is harder for learners to overcome non-facilitative influence of the language from which they have had more cumulative input. L3 learners who

might experience non-facilitation from L2 are expected to perform more target like than learners who might experience non-facilitation from their L1. The structures under investigation are a match between L1 and L3 and mismatch between L2 and L3 for the learners of this study, and so following the CITH they would be expected to judge these structures more target-like than a group whose L1 is a source of non-facilitative influence.

In order to investigate property-by-property versus wholesale transfer and factors influencing the selection of the source(s) of transfer, the current study poses the following research questions:

RQ1: Is there evidence of property-by-property transfer of both available languages, L1 and L2, or rather of (wholesale) transfer of either L1 or L2 in the acquisition of V2 in adverb placement and non-subject initial declaratives in the early stages of L3 acquisition?

RQ2: Is there an overall effect of sentence type (habitual adverbs and non-subject initial declaratives) on accuracy in judgement of verb placement in L3 German development when comparing test time one to test time two?

RQ3: Which factors determine the source of cross-linguistic influence in the acquisition of morphosyntactic structures in L3?

This study's methodology is based on the study "L3 development: A longitudinal study on L3 German in Norway" (Kolb, Guajardo & Westergaard,2021/in preparation). The AJT used in this study was adapted to match the vocabulary used in the participants' textbook. In order to answer the research questions, Norwegian speaking high school students completed an Acceptability Judgement Task (AJT) in L3 German and L2 English containing the two target conditions (habitual adverbs and non-subject initial declaratives) twice over a period of one year. The participants are native Norwegian speakers who have learned L2 English since beginning elementary school. They completed the two AJTs for the first time after three and a half months of exposure to L3 German and a second time one year later with continuous exposure to L3 German in the form of classroom instruction (one and half hour lessons twice a week). The results of the AJT in English showed that the participants had acquired the two structures under investigation in their L2. At test time one participants judged the items containing the target conditions at chance level. The data did not show a preference for either

V2 (target like) or V3 (non-target like). This study did not find evidence of wholesale transfer. Rather, the data from the AJT in German at test time one suggests that both previously acquired languages influence the acquisition of the L3 morphosyntactic structures under investigation, as participant's judgement of the structures is at around chance level. At test time two, participants performed significantly more target-like when judging the structure habitual adverbs as compared to the structure non-subject initial declaratives. This finding speaks for the notion of property-by-property transfer. As regarding to the question which factors may determine a predominant source of transfer, the data supports that economy plays a main role in cross-linguistic influence as the participants performed significantly more target-like when judging the structure habitual adverbs as compared to the structure non-subject initial declaratives in L3 German at test time two.

This thesis is structured in the following manner. Chapter 2 presents the theoretical framework for the morphosyntactic structures under investigation and provides an account for verb placement in the languages relevant to this study. Chapter 3 is a review of current studies investigating the acquisition of morphosyntactic structures in L3 and narrows in on the acquisition of verb placement. The research questions and predictions are stated in chapter 4. Chapter 5 describes the methods used in this study. The results are presented in chapter 6. The key findings are summarized and interpreted in chapter 7, discussion. The final chapter, chapter 8, is the conclusion. The sentences used in the German AJT and the English AJT are in Table 8 and 6 in Appendix 1. Table 10 in Appendix 2 reports the statistical analysis.

2 Theoretical Background

This section presents the theoretical background and framework relevant for the present investigation. First, in connection with this, the assumptions of Universal Grammar and the Principles and Parameters theory for language acquisition are briefly discussed. The second part of the section discusses the underlying assumptions for the empirical phenomena investigated in this study and presents the assumed derivation underlying finite verb

placement in the languages relevant to the study at hand. The section concludes with a cross-linguistic comparison of verb placement for the languages involved in this study.

2.1 Theory of Universal Grammar, Principles and Parameters

The current study is set within the theoretical framework of the generative linguistic theory (Chomsky, 1957;1967) and the Minimalist Program (Chomsky, 1995). These theories are based on the notion that grammar consists of mental representations which are constrained by linguistic universals. Universal Grammar (UG) is part of the innate language faculty that everyone is born with. UG makes it possible for us to learn language, no matter what our native language may be (Åfarli, 2015, p.63). This abstract grammar is universal for all languages. By means of the UG, humans acquire grammar for their mother tongue. The internalized grammar of a native Norwegian speaker is different from that of a native English or German speaker; however, both are based on the same UG. The theory of UG states that there are principals governing UG which are fixed, while additionally there are parameters which are more flexible and language specific. Parameters are variable across languages and are established through linguistic input. The V2 phenomenon has been described as an example of a parameter. In Norwegian and German this parameter is set to the value V2, while in English it is not switched to this value.

Furthermore, the Minimalist Program proposes an explanation for how to link sound and meaning. It argues that the language faculty involves two components in the brain: the articulatory perceptual system and the conceptual intentional system. The phonetic form (PF) and the logical form (LF) are connected in interfaces. Lexical elements are the input and the PF and the LF are the output. The sound-meaning link is described by derivation. According to the Minimalist Program, derivations are restricted by general conditions of economy. They favor local relations and simple structures. In relation to verb placement, English has the most economical derivation for generating adverb placement and non-subject initial declaratives as compared to German and Norwegian.

2.2 Word order in German, Norwegian and English

This section examines and offers derivations of word order and verb placement for the languages under investigation: German, Norwegian and English. Languages are often categorized by the order in which subject (S), verb (V) and object (O) occur in a sentence. That is, which order is the basic order that all other occurring orders can emerge from in a minimalist way. Basic word order is defined as the order which allows other existing orders to be derived in the least complex way, requiring the least number of additional rules and exceptions (Vikner 2019). English and Norwegian are widely agreed upon to be SVO languages (Greenberg 1963, Vikner 2019). German, on the other hand has been argued by some (Greenberg 1963, Bohn 1983, Whaley 1997) to be an SVO language while others maintain that based on a theoretical analysis German has the underlying basic word order SOV (Vikner 2019, Adger 2003). The argument for German's basic constituent order being SVO is mainly based on the fact that it is "the most frequent order" or the "pragmatically most neutral order" (Whaley 1997). This argument has been criticized for being based on tendency rather than theory. While the SOV word order overtly present in subordinate clauses in German, has been shown to be the order from which all other actually occurring orders can be derived in the least complex way (Vikner 2019). The argument for German being an SOV language follows the definition of a basic word order given in the beginning of this paragraph. The order which all other word orders of a language can be derived from most directly. Therefore, I would follow the second group of proposals and categorize German as a SOV language. In this study however, structurally, only main clauses were included, and differences in underlying word order between Norwegian and German (i.e., SVO vs SOV) are not overt.

Another significant syntactic characteristic to compare and categorize languages by, is the Verb-Second (V2) phenomenon. The V2 phenomenon is characterized by finite verbs appearing in the second constituent position in a clause, immediately after the first constituent, crucially when the first constituent is something other than the subject of the sentence. V2 word order differs from the basic order as it is a derived order, which is standardly assumed to result from verb movement from V to I(nflectional) to the C(omplementizer) position (Vikner 1995). Minimalist theory suggests that cross-linguistic

variations of verb placement arise due to parameterization of features. Features distributed in a clause can either be strong, and trigger movement or weak, not driving movement in a language (Adger 2003). Norwegian and German are described as exhibiting the V2 phenomenon, while English is not.

The next paragraph provides a syntactic derivation of verb placement in German, Norwegian and English declarative sentences and aims to highlight the cross linguistic similarities and variations of these three languages. I analyze my data within the theory of generative grammar, where movement of the verb explains its placement in the clause.

2.2.1 Verb Placement in German

As explained in the previous section, German is a SOV language with V2. The underlying structure of a German clause is presented in the figure below. To account for verb placement and negation the following syntactic tree (Fig.1) is assumed.

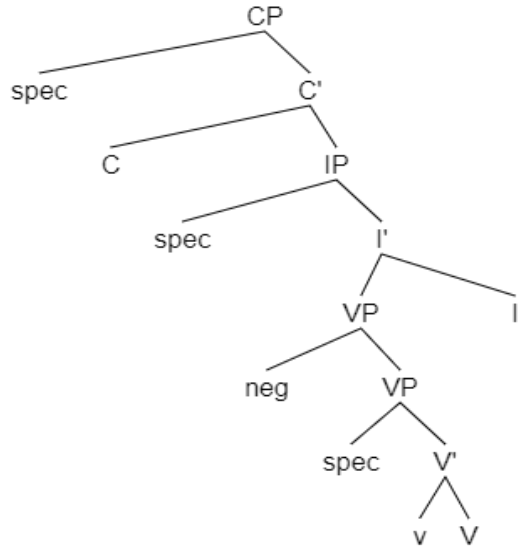

Figure 1: Syntactic tree for verb placement in German

Figure 1 follows the X-bar theory, which assumes that all phrasal categories project from their heads. Heads are lexical categories, like verbs, nouns and adjectives and functional categories,

like inflectional and complementizer categories. The linear order differs across languages. Figure 1 is adapted from Clahsen et al. (1993/1994: 398).

In German, finite verbs may be placed in first, second and final constituent positions. The three possible positions can be accounted for using a double movement analysis and syntactic structure as in (1). The finite verb in first position occurs in yes/no questions, imperatives, and topic-drop structures. In these cases, the finite verb raises to spec C. The V2 phenomenon and wh-questions can be accommodated by raising the finite verb from V to I to C and the topicalized constituent or the wh-word taking the specifier position of CP. Lexical complementizers that introduce subordinate clauses take the C position and thus prevent the finite verb from raising to C in clauses that are not main clauses. Under this derivation the negation marker also lands in the grammatically accurate position. When the finite verb raises in main clauses and wh-questions, the negation marker stays below the finite verb. In a subordinate clause the verb does not raise, and the negation marker precedes the verb. The syntactic structures in focus of this investigation (adverb placement and non-subject initial declaratives) have an underlying representation where the finite verb raises from V to I to C.

2.2.2 Verb placement in Norwegian

Norwegian is categorized as an SVO language which exhibits the V2 phenomenon. Norwegian has the underlying word order SVO but movement of the finite verb from V via I to C in all main clauses is obligatory (cf. Holmberg & Platzack, 1995; Roberts, 2001). Although, topicalized sentences can allow for OVS word order in declarative main clauses, this cannot happen in the subordinate clause structure which has a strict SVO order. Norwegian is assumed to have verb movement to C in all types of main clauses. As in German, the V-to-I-to-C movement rule of Norwegian results in V2 order in the structures under investigation (e.g., Holmberg & Platzack, 1995; Roberts, 2001).

Another asymmetric account for German and Norwegian, argues that in declaratives with adverbials the finite verb only moves to I (see e.g., Travis, 1991; Westergaard et al., 2019; Zwart, 1997).

2.2.3 Verb Placement in English

English is a SOV language which does not exhibit the V2 phenomenon. English only allows verb movement with auxiliary verbs (V-to-I movement), as well as subsequent movements to C in questions which exhibits a subject-auxiliary inversion. In English, the lexical verb remains in-situ at VP. Regarding the structures in this study, habitual adverbs and non-subject initial declaratives, the lexical verb stays at VP and the lexical verb becomes the third constituent in both structures.

2.2.4 Cross-linguistic Comparison of Verb Placement

According to the Principles and Parameters theory, the parameters of a language can vary. The position of the finite verb in a declarative sentence is an example of parametric or cross-linguistic variation. In accordance with the generative grammar, I assume in my analysis that ordinary finite clauses have a minimal structure consisting of the hierarchical projection VP-IP-CP (Chomsky, 1986); movement is triggered by feature checking and features can exhibit either a strong or weak value. When the feature value is strong, movement will take place. Table (1) displays a summary of the non-subject initial (top) values of the languages under investigation.

Table 1: Language specific parametric values for declarative main clauses

	Decl on I	**[top] on C**
English	weak	optional
Norwegian	strong	strong
German	strong	strong

Norwegian and German are marked as having strong values for declarative main clauses (Decl) on inflection (I) and non-subject initial main clauses [top] on the complementizer (C) parameters, since they exhibit the V2 property. English does not exhibit the V2 property and is therefore marked as having a weak Decl on I value. The [top] on C parameter is described as optional because, while it is not obligatory, topics may appear on the left periphery of the clause. Table (1) is adapted from Adger (2003:332).

The two types of declarative main clauses with lexical verbs which are under scrutiny in this study are 1) subject-initial main clauses with habitual adverbials (referred to as adverb placement) of the type often and seldom and 2) non-subject initial declaratives with topicalized temporal adverbials. As presented above, German and Norwegian are similar in that they require the finite verb to undergo long movement V-I-C in these types of main clauses, while in English, on the other hand, the lexical finite verb remains in the VP. Differences in verb movement result in different surface word orders of the languages.

As explained above, in English, lexical verbs remain in-situ and therefore appear as the third constituent (V3) for both sentences with non-subject initial declaratives (see example (1) and adverb placement (see example (2). Since Norwegian and German have obligatory movement of finite verbs to C in main clauses, the finite verb is the second constituent (V2) in both sentences with sentence adverbs and non-subject initial declarative structures.

(1) a. [CP På lørdag danser [IP Laura danser [VP danser i hagen]]]. (Top,V,SU)

On Saturday dances Laura in garden-the.

b. [CP On Saturday [IP Laura [VP dances in the garden]]]. (Top,SU,V)

c. [CP Am Samstag tanzt [IP Laura tanzt [VP im Garten tanzt]]]. (Top,V,SU)

On Saturday dances Laura in-the garden.

(2) a. [CP Peter spiller [IP spiller [VP sjelden spiller spill.]]]. (V,SA)

Peter plays rarely games.

b. [CP Peter [IP [VP rarely plays games]]]. (SA,V)

c. [CP Peter spielt [IP spielt [VP selten Spiele spielt]]]. (V, SA)

Peter plays rarely games.

Norwegian uses underlying SVO word order but movement of the finite verb via I to C in all main clauses is obligatory (cf. Holmberg & Platzack, 1995; Roberts, 2001).

Table 2: Sentence-medial adverb word order in German, Norwegian, English

First constituent	**Second constituent**	**Third constituent**	**Fourth constituent**	**Sentence, adverb placement**
Michael	**trifft**	oft	Freunde.	
Michael	**møter**	ofte	venner.	
Michael	often	**meets**	friends.	

Table 3: Non-subject initial declarative word order in German, Norwegian, English

First constituent	**Second constituent**	**Third constituent**	**Fourth constituent**	**Sentence, non-subject initial declarative**
Am Sonntag	**ist**	Tina	in Frankfurt.	
På søndag	**er**	Tina	i Frankfurt.	
On Sunday	Tina	**is**	in Frankfurt	

As illustrated in Table 2 and 3, German and Norwegian have the same surface word order regarding non-subject initial declaratives and adverb placement sentences. That is, the finite verb is always the second constituent (V2). English word order in these sentence types on the other hand follows a different pattern. In English the lexical verb is always the third constituent (V3) in these sentence types.

3 Literature Review

This section presents a summary of current theories and their studies on modes and source selection of transfer regarding morphosyntactic structures in L3 acquisition. The first part discusses models that have used a range of different morphosyntactic structures to investigate and account for patterns of cross-linguistic influence in L3. The second part narrows in on studies that are specific to the acquisition of verb placement in L1, L2 and L3.

3.1 Modes and Sources of Cross Linguistic Influence in L3 Acquisition

Much of the discussion within the field of Third Language Acquisition centers around investigating sources and determining characteristics of transfer as well as establishing which factors lead to CLI/transfer in the L3 acquisition process. The formal investigation of L3/Ln acquisition is a field of study that has developed in succession to the field of second language acquisition (SLA) and has naturally been primed by it. One of the central issues in the field of SLA has been understanding the role of CLI/transfer in the L2 acquisition process. Unlike the process of L1 learning, where a child is essentially at a blank slate starting point with Universal Grammar and linguistic input guiding the acquisition process, the process of acquiring a second language or in the L3A context subsequent languages involves contribution from one or more grammar systems that are already present and available to the parser. First, I want to consider SLA, as this has been the starting point for much of the research done in the field of L3 acquisition. How much of this knowledge might be transferred from L1 during the L2 acquisition process? Everything, something or nothing? Two influential models addressing this question for SLA are the Full Transfer/Full Access (Schwartz & Sprouse, 1996) and Minimal Trees (Vainikka & Young-Scholten, 1996). The first model, as its name indicates, maintains that at the initial state of L2 acquisition the complete grammar of the L1 is transferred. While the second model, Minimal Trees, argues that only partial transfer occurs. Only lexical elements, but not functional elements above the

VP (Verb Phrase) are available for transfer. This discussion has stretched into the more recent field of research of L3A. The question remains, does transfer happen wholesale, in one fell swoop (Westergaard, 2023) or is the process more selective and flexible? Furthermore, the question expands as we add languages, which factors are influential in determining the source (or language(s)) of transfer? Does CLI change as the acquisition process develops over time of exposure? Is transfer exclusively facilitative or can it lead to non-facilitation as well?

Data from a wide range of empirical studies show that transfer can be facilitative and non-facilitative (Rothman, 2015, Bardel & Falk, 2012, Slabakova, 2017, Westergaard et al., 2017). Factors that determine the source of transfer which have been discussed in the literature include individual morphosyntactic structural similarities, order of acquisition, main language of communication and general perceived typological similarity of available languages. The first mentioned proposed factor (structural similarity) maintains that CLI/transfer can potentially stem from both previously acquired languages (L1 or L2). This entails that transfer does not happen wholesale, but rather occurs property-by-property. Precisely that the parser's access to all previously learned grammars remains available for activation throughout the L3/Ln acquisition process (see Westergaard et al. 2023 for a review). The other proposed factors, suggest that at the initial stages (which are not clearly defined), one of the two previously acquired languages based on either a privileged status due to order of acquisition, dominant use or typological similarity is chosen by the parser for transfer.

So, the existing knowledge of L1, and in the case of L3 learners, knowledge of L2 provide the opportunity for transfer of linguistic knowledge in the second and multilanguage acquisition process. Does transfer occur selectively (property-by-property) or holistically (wholesale)?

Proponents of wholesale transfer argue that it is more economical for the parser to inhibit an entire language grammar and choose only one to copy and use as a building platform for the L3 acquisition (see Rothman 2015). Property-by-property proponents reason that it would be much more costly for the parser to inhibit an entire grammar when it can result in being a valuable resource and argue that co-activation of previously acquired languages is more economical in the construction of a new interlanguage grammar.

Furthermore, proponents of wholesale transfer argue that the parser "chooses" one previously acquired language as the template for learning the new grammar. The parser applies all

feature specifications belonging to this language to the new language. Selective transfer on the other hand, argues that the parser is flexible and maintains access to all previously learned languages in the process of constructing the new grammar. Linguists present opposing arguments for both selective and wholesale transfer, while the notion that previously acquired languages influence the acquisition of subsequent languages and that this can lead to both facilitation and non-facilitation is widely agreed upon.

Considering L3 acquisition, there are then three logical possibilities for the source of transfer: a) transfer from L1, b) transfer from L2 or c) transfer from both L1 and L2 d) from either L1 or L2. Options a) and b) are based on order of acquisition. The source of transfer in options a) and b) is fixed by the privileged status of a prior language due to order of acquisition. There are studies that make a case for the privileged status of the L1 in the L3 acquisition process (e.g., Jin 2009, Na Ranong & Leung 2009, Hermas 2015) and studies that argue for the privileged status of the L2 (e.g., Bardel & Falk 2007, 2012). While both argue that the previously acquired language has a privileged status because of where and how it is stored in the brain, they have opposing views on whether this results in the L1 or the L2 as the main source of transfer in L3 acquisition. Option c) reasons that the parser has continuous access to all previously acquired grammars and that all previously acquired languages have the potential for cross-linguistic influence. This possibility is supported by The Cumulative Enhancement Model (CEM) (Flynn, Foley, Vinnitskaya, 2004), The Linguistic Proximity Model (LPM) (Westergaard et al., 2017) and the Scalpel Model (SM) (Slabakova, 2017) and the Full Transfer Potential Hypothesis (FTP) (Westergaard et al., 2023). These models hold that the parser has and maintains simultaneous access to any previously acquired languages, and any and all of these have the potential to exhibit cross-linguistic influence on the L3/Ln. Option d), as option a) and b), suggests a single predominant source of cross-linguistic influence, but the determining factor is not order of acquisition. Rather that CLI can proceed from either L1 or L2 based on overall typological similarity or dominance of use. Studies in support of possibility d) are for example, the Language of Communication Model (Fallah et al. 2016) and the Typological Primacy Model (TPM) (Rothman 2015). The Language of Communication Model hypothesizes that at the initial stages of L3 acquisition, syntactic transfer originates primarily from the language of communication, defined by the authors as "the spoken language used more frequently by the participants at home (with their parents and siblings), in social contexts (with friends, relatives and other people) and at school (in the

classroom and in the playground)" (Fallah, 2018: 1) and irrespective of order of acquisition. The TPM, is also in-line with option d) (transfer proceeds from either L1 or L2) but proposes that perceived typological similarity is the factor which determines the source of transfer. The TPM argues that the parser establishes which previously acquired language has a surface typology most like the new target language and so, based on this perceived typological similarity, the parser transfers the complete grammar from this previously acquired system (either the L1 or the L2). The TPM is unique in that it is the only model (discussed here) which argues for exclusive transfer vs. predominant transfer of one source.

In the following section, I will discuss the eight above mentioned models proposed to explain linguistic influence from previously acquired languages on the acquisition of a third language and some of the empirical data supporting these claims. In section 3.1.9, I will also present the study which proposes the CITH (Cabrelli and Iverson, 2020). The CITH addresses CLI in light of the development of the L3 interlanguage grammar and argues that non-facilitative cross-linguistic influence is in correlation with the amount of input a language learner has had in a previous language. The more input a language learner has had in a previous language, the stronger the cross-linguistic influence.

3.1.1 Privileged role of L1

Several studies have found data to support the hypothesis that the native language plays a privileged role in the initial stages of L3 acquisition (Hermas 2010, 2015; Jin 2009; NaRanon and Leung 2009). Hermas (2010) investigated the acquisition of L3 English by native Moroccan-Arabic speakers who have French as their L2. The property under investigation was verb movement represented by sentential negation and adverb placement. Moroccan-Arabic and French follow the same (surface) word order in sentential negation while English has a different word order. Regarding adverb placement Moroccan-Arabic has two possible sequences; one of which is like English and the other like French. The authors predicted transfer from L1 Moroccan-Arabic in the form of interchangeable pre- and post-verbal positioning in sentences with frequency adverbs. To test their hypothesis, three participant groups completed an acceptability judgement task and a preference test (PT). The participant

groups are organized as follows: two control groups consisting of 25 native French speakers and 25 native English speakers and one experimental group consisting of twenty L1 Moroccan- Arabic, L2 French and L3 English speakers. The AJT consisted of 12 grammatical items, 12 ungrammatical items and 24 fillers. The participants were given four options to respond: completely acceptable, completely unacceptable, maybe acceptable, and maybe unacceptable. The authors scored the responses by assigning four points for correct answers, two points for "maybe" correct responses and zero points for incorrect responses. The PT included twelve sentence pairs, six per condition (negation/adverb placement) and 45 fillers. The participants could choose one of three responses: sentence A is better than B, B is better than A or A is equally good as B. Both the AJT and the PT results showed that the L3 participants had most difficulty with the adverb placement, specifically judging ungrammatical sentences of this type in both the AJT and the PT. The participants considered the sequence SVAdvO to be equally as acceptable as *SAdvVO. The first sequence is accurate in all three languages, while the second is only grammatical in Moroccan-Arabic and not in English nor French. The authors concluded that the study's results indicate that the participant's L1 (Moroccan-Arabic) is the source of the (non-facilitative) transfer in the L3 English acquisition process and in turn speaks for their hypothesis that the native language plays the dominant role in the L3 acquisition process, no matter whether the transfer from L1 provides facilitation or not.

3.1.2 The L2 Status Factor (L2SF)

The hypothesis of the L2SF states that syntactic structures are more readily transferred from a learners L2 than his/her L1. This notion builds on the proposed higher degree of similarity between L2 and L3 compared to L1 and L3. The similarity between L2 and L3 is attributed to a likely similar age of onset, outcome, learning situation, metalinguistic knowledge, learning strategies and degree of awareness in the learning process. According to the L2SF, transfer is not always facilitative.

In their paper "The role of the second language in third language acquisition: the case of Germanic syntax" Bardel and Falk (2007) presented data in support of the L2SF. In their

study, data from two groups of learners with different L1s and L2s both acquiring Dutch or Swedish was collected. The important difference between the groups is that one group's L1 exhibits the V2 phenomenon while their L2 does not. The reverse is true for the second group; their L1 is not a V2 language, but their L2 is a V2 language. As both Dutch and Swedish (the L3 for both groups) are V2 languages, their prediction was that the group whose L2 is a V2 language would outperform the group whose L1 is a V2 language. Their results showed that the two groups behaved significantly different. The group whose L1 does not exhibit the V2 structure, but their L2 does, performed more accurately in using the V2 structure in the L3 than the other group. Both groups were at the initial stages of L3 acquisition. The data was recorded during their first lesson in an immersion classroom setting. The participant number for this study was small, four participants in one group and five in the other.

In 2010, Bardel & Falk conducted another study resulting in evidence that supported the L2SF. This study's aim was to investigate whether L2 transfer can be found at intermediate stages of L3 acquisition. Again, data was collected from two participant groups with inverse L1 and L2 acquiring the same L3. Participants in group one (n=22) have English as their L1 and French as their L2. Participants in group 2 (n=22) have French as their L1 and English as their L2. Both groups are acquiring L3 German. The structure chosen to detect the source of transfer is object pronoun placement. Object pronoun placement in main clauses is post verbal in both English and German while it is preverbal in French. In subordinate clauses, French and German are alike, and the object pronoun is preverbal whereas in English it is still postverbal. The following are examples of the sentence types used in the study:

	Main clause			**Subordinate clause**					
	Ger = Eng ≠ Fr			**Ger = Fr ≠ Eng**					
German	Ich	sehe	ihn.	Du	weisst,	dass	ich	ihn	sehe.
	SUBJ	1SG	DO	SUBJ	2SG	SUBCONJ	SUBJ	DO	1SG
English	I	see	him	You	know	that	I	see	him.
	SUBJ	1SG	DO	SUBJ	2SG	SUBCONJ	SUBJ	1SG	DO
French	Je	le	vois.	Tu	sais	que	je	le	vois.
	SUBJ	DO	1SG	SUBJ	2SG	SUBCONJ	SUBJ	DO	1SG

The task was a grammaticality judgement and correction task (GJCT). The GJCT consisted of four different sentence types: two grammatical conditions where the German sentence was either congruent with the French word order (subordinate clauses with object pronouns) or with the English (main clauses with object pronouns). The other two sentence types were ungrammatical in German, but congruent with either the French word order or the English word order.

Regarding the grammatical sentences, both groups scored over 75 % which the authors defined as target-like acquisition of this structure in the L3. Nevertheless, the L2 French group still outperformed the L2 English group with regards to the sentence types that were alike in French and German, and the L2 English group judged with higher accuracy sentences that were alike between English and German. The results concerning the ungrammatical sentences showed stronger support for the L2SF hypothesis. The sentences which were ungrammatical in German and aligned with French word order were rejected and corrected 93.1% of the time by the L2 English group, while the L2 French group only rejected 28.7% of these items. The sentences that followed English word order but were ungrammatical in German were mainly incorrectly accepted by the L2 English group and mainly correctly rejected by the L2 French group. The authors conclude that the results show both positive and negative transfer from the participants' L2s. The distribution of acceptances and rejections can be attributed to negative transfer from English L2 in the ungrammatical sentence type that followed English word order and positive transfer from English L2 in the grammatical sentence type that is a like English word order. Similarly, the results showed evidence for non-facilitative transfer from French L2 in the ungrammatical sentence type that followed French word order and positive transfer from French L2 in the grammatical sentence type that agreed with French word order. Based on these results as well as the results of the previous study, the authors argue that the L2 has a stronger influence on the L3 acquisition than the L1 and that transfer from the L2 can be facilitative and non-facilitative in the process of L3 acquisition.

3.1.3 The Cumulative Enhancement Model (CEM)

The Cumulative Enhancement Model (CEM) proposes that all previously learned languages have potential to influence subsequently acquired languages. While L1 is determined not to have privileged status concerning transfer, the CEM proposes that cross-linguistic typological similarity will increase the possibility for transfer. The transfer of previously acquired structures can only be cumulative. This means that a previously learned language can be neutral during the subsequent acquisition process or enhance it, but never lead to non-facilitation. In the article "The Cumulative Enhancement Model" (Flynn, Foley & Vinnitskaya, 2004) the authors present an empirical study addressing the question whether solely the L1 determines L3 development or whether grammatical properties of both/all previously acquired languages can potentially influence the development of successive languages. The study focused on the acquisition of restricted relative clauses and compared learning patterns of this structure across four different language learner groups. First, they looked at children acquiring L1 English. Next, they considered two groups who were L2 learners of English with two different L1s, Japanese and Spanish. The final group were Kazakh native speakers, Russian L2 speakers acquiring English as their L3. The study looked at patterns of acquisition in the production of three types of restrictive relative clauses: Lexically headed specified and unspecified relative sentences as well as free relative sentences. The following are example sentence types used in the study:

1)Lexically headed, head with semantic content	Big Bird pushes the balloon [which bumps Ernie]
2) Lexically headed, head with no semantic content	Ernie pushes the thing [which touches Big Bird]
3) Free relative	Cookie Monster hits [what pushes Big Bird]

The task was an elicited imitation task. The stimulus sentences included an equal number of the three different classes of relative clauses which were balanced in terms of number of words and syllables. Participants were matched by L1, L2 and L3 proficiency levels (depending on which group they belonged to). The first group examined were the L1 English

learners. In early development of subordination L1 English children showed a clear primacy of the free relative clause construction over lexically headed relative clause constructions. The second and third groups were L2 English learners with two distinct L1s, namely Japanese and Spanish. Spanish and English are typologically similar (head-initial, right branching) while Japanese is typologically different (head-final, left-branching). The following are example sentences from the study.

(3) John read [$_{head}$the book [$_{complement}$ that Mary wrote]].

(4) John-wa [$_{complement}$Mary-ga kaita [$_{head}$hon-o]] yonda.

John-theme Mary-nom wrote book-acc read

'John read the book that Mary wrote' (Saito 1985)

(5) Juan leyó [el libro [que María escribió]].

Juan read the book that Maria wrote.

When comparing these groups, the authors found that the L1 Japanese speakers patterned alike the L1 English learners, suggesting that the structure had to be learned "from scratch". The L1 Spanish speakers who already had the parametric value of this syntactic structure in place on the other hand, did not exhibit primacy of the free relative clause construction. The results showed that these adult speakers scored most target-like with lexically headed relative clauses and rarely if ever converted the lexically headed clauses to free relatives (as L1 Japanese L2 English and early L1 English speakers did). In order to rule out a privileged status of L1, the fourth group examined consisted of L1 Kazakh, L2 Russian, L3 learners of English. Kazakh is typologically dissimilar to Russian and English which are both head-initial, right branching. Kazakh is similar to Japanese in regard to word order and branching direction. The following are examples of the sentence type lexically headed relative clause used in the study in Kazakh and Russian.

(6) [Sut- isken] kyz bolmege kirdi

milk-ACC drink-PART girl-NOM room-dat enter-past

'(A=the) girl who drank (the) milk entered (a=the) room'

(7) Professor [kotory priglasil lektora] predstavil vraca

professor-NOM who invite-PAST speaker-ACC introduce-PA doctor-ACC

'The professor who invited the speaker introduced the doctor'.

This group's acquisition pattern matched the pattern displayed by the L1 Spanish, L2 English speakers rather than those of the L1 Japanese, L2 English speakers. This suggests that a previously developed CP structure, also when not pertaining to the L1, can influence the subsequent development of the CP structure in another language. The authors deduced that this supports the hypothesis that any previously learned language can influence subsequent acquisition of a new language and that the L1 does not have a privileged status in this development. The authors furthermore argued that the results support the basic premises of CEM that cross-linguistic influence can only be neutral or enhance learning. While the study presented in this article shows facilitation by cross-linguistic influence it does not eliminate the possibility of non-facilitative influence because the absence of evidence is not enough to rule out a logical possibility.

3.1.4 The Dominant Language Hypothesis/ Language of Communication Model

The authors of the study "L3 acquisition of English attributive adjectives" (Fallah & Jabbari, 2018) put forth the so-called dominant language hypothesis which states that "the dominant language of communication determines the source of CLI at the initial stages of L3 acquisition, irrespective of its status as L1 or L2." (p.18). The study found support for the dominant language being the source of transfer in the early stages of L3 acquisition. The authors defined the term dominant language as follows: "the spoken language used more frequently by the participants at home (with their parents and siblings), in social contexts (with friends, relatives and other people) and at school (in the classroom and in the playground)" (p.2). In the study, the authors collected data from three participant groups, all near native speakers of their respective L2s and all at the early stages of English L3 acquisition. Participant group A consisted of L1 Mazandarani, L2 Persian speakers whose dominant language of communication was Mazandarani (henceforth called Mazandarani A group). Group B has the same L1/L2 language combination as Mazandarani A group, but

their dominant language of communication was Persian. This group will henceforth be referred to as Mazandarani B group. The third group was made up of L1 Persian, L2 Mazandarani speakers whose dominant language of communication was Persian (henceforth, Persian group). The structure used in the investigation was the placement of attributive adjectives. In both Mazandarani and English attributive adjectives precede their nouns. In Persian attributive adjectives occur post-nominally. The structure is therefore alike in English and Mazandarani while Persian is different. The participants completed two tasks, a grammaticality judgement task (GJT) and an element rearrangement task (ERT) that focused on the target structure, placement of attributive adjectives. The Mazandarani A group scored with the highest accuracy on both tasks. Their mean score on the GJT was approximately 26 out of 30 and on the ERT the mean score for this group was approximately 12 out of 15. The Mazandarani B group and the Persian group on the other hand scored with very low accuracy. The mean accuracy score for these two groups on GJT was approximately 6 out of 30 and between 3.5 and 4 out of 15 on the ERT. The authors concluded that these results indicate facilitative influence of Mazandarani when it is the dominant language of communication, as Mazandarani and English pattern alike regarding this structure. At the same time, the results indicate a non-facilitative cross-linguistic influence in the other two groups as their dominant language of communication is Persian which presents a mismatch with English regrading attributive adjectives. Furthermore, the authors concluded that the data does not agree with the L1 Status Factor, the CEM or the TPM. If the L1Status Factor was indeed the deciding factor for the source of CLI than both Mazandarani A and B group should have scored with similarly high accuracy. Regarding the CEM, all groups should have scored with high accuracy as they all had access to the facilitative language, in this case Mazandarani. The same is true for the TPM, as all groups had access to the same grammars.

3.1.5 Typological Proximity Model (TPM)

The TPM proposed by Rothman (2011) holds that wholesale transfer of syntactic properties from either L1 or L2 takes place in the initial stages of the L3 acquisition and is driven first by the perceived or actual typological proximity of the target language measured against other

previously acquired languages regardless of order of acquisition or whether the transfer results in facilitation or non-facilitation. After the learner has had some basic experience with the L3, the parser selects one of the previously acquired languages based on typological similarity between the "new" and the "old" languages and then transfers the entire grammar from this source/language to create the basis of the new target interlanguage grammar. There are two pre-requisites for this selection process to determine transfer. One is that one of the previously acquired languages is actually or perceived as typologically similar and two, that all previously acquired languages are not equally alike the target language. When these pre-requisites are met, the TPM holds that transfer from the language perceived as typologically most like the target L3 proceeds wholesale, no matter whether it is the most economical option, e.g., transfer may lead to non-facilitation. When present, the TPM states that language proximity (perceived or actual) takes precedent over other factors (i.e., L2SF) in determining the source for linguistic transfer.

In the article "L3 syntactic transfer selectivity and typological determinacy: the Typological Proximity Model" (2011) empirical data is presented in favor of the notion that typological proximity takes precedence over the L2 status factor when relevant language pairings are involved. The study compares two L3 learner groups and measures these against native speaker control groups. One L3 group consists of L1 Italian, L2 English, L3 learners of Spanish and the other consists of L1 English, L2 Spanish, L3 learners of Brazilian Portuguese. The first group's L1 and L3 are both romance languages and typologically more similar than the L2 English. In the second group on the other hand, L2 and L3 are both romance languages and the L1 is least typologically similar. These language pairings provided an opportunity to investigate whether typological proximity or order of acquisition takes precedence in deciding the source of transfer in the L3 context. The syntactic structure used in this investigation was adjectival interpretation. Adjectives may be placed pre- and post-nominal in the romance languages involved in this study. Pre-nominal adjectives are semantically interpreted as set-denoting, while post-nominal adjectives are kind-denoting. English does not share this feature. English only allows for adjectives to occur pre-nominal. The TPM predicts that both L3 learner groups will show knowledge of the subtle adjectival semantic nuances, as transfer in their L3 acquisition process will proceed from the typologically more similar language which shares the syntactic structure with the target L3. The study included two experiments. The first experiment was a semantic interpretation task

presented in either Spanish or Brazilian Portuguese in accordance with the participant's target L3. Participants were presented with sentences including either pre- or post-nominal adjectives and two possible sentences describing the two possible interpretations. The second experiment was a context-based collocation task. The participants read a short story and filled in the blank with a given adjective either pre- or post-nominally. The results showed that L3 groups performed within the range of the native control groups. The authors conclude that both sets of L3 learners demonstrate knowledge of adjectival interpretation and that this knowledge is a result of transfer from Italian (L1) in the acquisition of L3 Spanish and transfer from L2 Spanish in the acquisition of L3 Brazilian Portuguese. Further they concluded that not the order of acquisition, but rather the typological proximity of the previously acquired languages determined the source of transfer.

3.1.6 Linguistic Proximity Model

The Linguistic Proximity Model (Mykhaylyk et al, 2015; Westergaard et al, 2017; Westergaard et al. 2023) holds that the parser maintains access to all previously acquired languages and that transfer during the L3 acquisition process is selective and proceeds property-by-property. Transfer is not wholesale and rather than based on order of acquisition or general typological proximity, the similarity of abstract linguistic properties influences the selection of source of transfer. As all previously learned languages remain active and accessible during the L3 acquisition process, transfer can be facilitative as well as non-facilitative.

In the article "Crosslinguistic influence in the acquisition of a third language: The Linguistic Proximity Model" (Westergaard et al., 2017), the authors present an empirical study to test the predictions of the CEM, TPM and LPM. The study examined the performance of three groups on a Grammaticality Judgment Task (GJT) in English with two target conditions concerning word order. Group one consisted of Russian-Norwegian bilinguals living in Norway. The second group was Norwegian monolinguals and the third Russian monolinguals. All three groups were acquiring L3/L2 English. All participants scored similarly on an English vocabulary test and have had English lessons at school for a similar amount of time.

These language pairings were chosen to test the significance of general typological similarity contrasted with abstract linguistic structural similarity. English and Norwegian are both Germanic languages, while Russian belongs to the Slavic language family, and is thus typologically more distant from English (the L3) than Norwegian. Two structures were chosen that present partial linguistic overlap. Condition one is the V2 phenomenon exhibited in habitual adverbs in Norwegian (and all Germanic languages except English) but not present in Russian nor English. Condition two is subject-auxiliary inversion in wh-questions present in both Norwegian and English, but not exhibited in Russian. Regarding condition one, the LPM predicts that monolingual Russians will perform most accurately of all groups due to facilitation from Russian, and that the Norwegian-Russian bilinguals will outperform the Norwegian monolinguals, as the bilinguals have access to the Russian grammar and the structural similarity between Russian and English regarding this condition will lead to transfer/crosslinguistic influence. The TPM on the other hand, would predict non-facilitative influence from the typologically more similar language, Norwegian. Furthermore, the LPM predicts that the bilinguals will nonetheless not outperform the Russian monolinguals as they might also experience non-facilitation from Norwegian. As predicted by the LPM, the results indicated that the bilinguals performed significantly more accurately as compared to the Norwegian monolinguals, but with less accuracy than the monolingual Russians (although the difference didn't reach statistical significance). In condition 2 no significant difference between the three groups was observed, all groups performed comparably, suggesting that this condition may have already been successfully acquired by all groups. The authors concluded that the general typological proximity of Norwegian and English is superseded by the structural similarity in the first condition between English and Russian as the factor determining cross-linguistic influence in L3 acquisition.

Kolb et al. (2022) found further support for the LPM. This study included three language learner groups. Group 1 were Russian/German bilinguals acquiring L3 English. The second group were German monolinguals acquiring L2 English and the third group were Russian monolinguals acquiring L2 English. Participants of all three groups were matched in age, (English) proficiency, age of onset and length of exposure. Participants completed an AJT containing four target structures (subject-auxiliary inversion, determiner use, adverb placement and non-subject initial declaratives). Two of the structures are a match between German and Norwegian and two are a match between Russian and English. The results of the

AJT showed that the bilingual group acquiring English as an L3 judged the conditions that are a match between English and German more target-like than the participants of the Russian monolingual group but less target-like than the German monolingual group. The results were inverse for the structures that were similar in Russian and English. The Russian monolinguals judged these sentence types most target-like, and the L3 group judged them more target-like than the German monolinguals. The authors conclude that these results support the LPMs hypothesis that cross-linguistic influence in L3 is the result of co-activation of the previously acquired languages in processing. The co-activation of the previously acquired languages become visible in the difference in judgements of the structures under investigation by the groups with different language backgrounds. The L3 group accuracy falls in between the monolingual groups, outperforming on the structures that are a mismatch for the L1 group and performing less target like on the structures that are a match between the L1 and L2. As the L3 group has both languages available for cross-linguistic influence they experience both facilitation and non-facilitation on all four structures.

3.1.7 The Scalpel Model

"The Scalpel Model of Third Language Acquisition" (Slabakova, 2017) is in marked agreement with the LPM. As the LPM, the Scalpel Model opposes the notion of wholesale transfer and presents an argument for selective transfer where the parser maintains access to all previously learned languages. If a relevant structure has been successfully acquired in the L1/L2, it has the potential to influence the acquisition of a new interlanguage grammar. The model proposes that in a multilingual brain all linguistic knowledge is interconnected. There is one human brain with multiple grammars and not two or more monolinguals in one person. To strengthen the argument, Slabakova (2017) presents a study on neurolinguistic localization which shows that the same language-related brain areas are used in multilingual, bilingual and monolingual contexts (Abutalebi & Green, 2007). Slabakova also points out that in order to choose one of multiple available grammars and inhibit the other grammar(s) - as suggested by the proponents of the wholesale transfer hypothesis - is not necessarily the parser's most economical choice. Considering our knowledge about the neural functional organization of

language, a situation when the speakers need to categorically block off linguistic information from a whole language rather than maintaining access to it as a resource when needed, seems like a very taxing option. Slabakova also finds support for the property-by-property transfer model in contemporary research on L3 lexical processing. Recent studies (González Alonso, 2012; Hall & Ecke, 2003) present empirical data in support of maintained simultaneous access to the L1 and L2 mental lexicon from the very beginning of the L3 acquisition process. Following the minimalist approach to grammar, the functional lexicon contains the specific grammar rules. Lexical items are connected to the grammatical features that determine the morphosyntax of any language and since lexical items are co-activated in a bilingual mind the functional features associated to the lexical items are also activated. In the L3 acquisition process then the grammatical features of both previously acquired languages are also co-activated and open for property-by-property influence.

Furthermore, Slabakova agrees with the LPM in that property-by-property transfer may be facilitative or non-facilitative. And while any previously acquired language is available for transfer, the question remains which factor(s) determine the source of transfer. In contrast to the TPM, the LPM and the Scalpel model argue that other factors besides (general- /psycho-) typological similarity can predict the source transfer. Specifically, Slabakova proposes that experiential- and linguistic input, structural similarity and language usage are important factors influencing the source of transfer. The lack of input, due to for example an infrequently used structure can hem the building of the new grammar while frequently occurring structures create repeated positive evidence which can lead to a change in the interlanguage grammar.

In summary the Scalpel model maintains that multilingual grammars do not need wholesale transfer at the initial stages. In Slabakova's words:

"multilingual grammars are sufficiently sophisticated not to need wholesale transfer at the initial stage. The activated grammatical possibilities of the L1-plus-L2 combined grammar act with a scalpel-like precision, rather than as a blunt object, to extract the enhancing, or facilitative, options of L1 or L2 parameter values. However, additional factors such as processing complexity, misleading input, and construction frequency in the target L3 are also operative property by property. They are the factors that can lead the scalpel away from

precision. If negative evidence is needed, or if the evidence in the input is insufficient for acquisition, that property will be hard for learners and successful acquisition is not guaranteed. Is the scalpel model falsifiable? Evidence against the model can come from empirical result».

3.1.8 Full Transfer Potential (FTP)

Westergaard et al. (2023) elaborate on the theoretical arguments behind the LPM and Scalpel Model and refine their hypothesis that cross-linguistic influence is a process that proceeds property-by-property involving either or both previously acquired language to the Full Transfer Potential (FTP). The FTP states that "anything can transfer, not that everything does transfer". The models are based on the minimalist approach to grammar which assumes that a language's grammar is a combination of a few universal principals (UG) and a language specific functional lexicon which contains the language specific grammar rules. The Borer-Chomsky Conjecture furthermore states that variation in languages is restricted to functional features in the lexicon. Functional features or grammar do not stand in isolation from other parts of language. It is an aggregation of separate yet connected mental representations of sounds, lexical items, formal features, morphemes with feature bundles and syntactic and semantic operations. Specifically, the interconnectedness of lexicon and grammar are relevant for the TFP. Extensive research on word recognition in a bilingual context shows that words are co-activated (words in both languages are activated) when one of the languages is being used. If the words/lexicon contain the specific grammar rules, the functional features associated with the lexical item are logically also activated. In the L3 morphosyntactic acquisition process then both previously acquired languages' lexicon and functional features are co-activated and may be available for cross-linguistic influence. The authors concluded that more research is necessary to investigate the co-activation of grammatical features in the multilingual acquisition process.

All studies presented in this section found empirical data to support their distinctive theories and models of cross linguistic influence in the process of L3 acquisition. More investigations are necessary to further explore the role of different factors involved in predicting the CLI and

to understand the complex role that cross-linguistic influence can play when there are two or more grammars available for the language learner to draw from in the acquisition of a new grammar.

3.1.9 The Cumulative Input Threshold Hypothesis (CITH)

In their study "The roles of L1 Spanish versus L2 Spanish in L3 Brazilian Portuguese morphosyntactic development", Cabrelli and Iverson (2020) investigate whether non-facilitative transfer from the L2 can be overcome faster than non-facilitative transfer from the L1 and put forth the Cumulative Input Threshold Hypothesis (CITH). The hypothesis states that the more cumulative input a language learner has had in a previous language, the more cumulative input they will need in the new language to overcome a possible non-facilitative influence. To test this, the authors conducted an acceptability judgement task with four participant groups and one control group. Two groups were L1 English advanced L2 Spanish speakers acquiring L3 Brazilian Portuguese (BP). The difference between these two groups was that one was at the initial stages of the L3 acquisition process, and the other group was of advanced proficiency in the L3. In other words, the learners knew the same languages but were at different linguistic developmental stages. The next two participant groups were recruited with the same inclusion criteria related to proficiency in the L3, but with mirrored language pairings with respect to the previously acquired languages, i.e. were L1 Spanish advanced L2 English speakers. The control group consisted of native BP speakers. The morphosyntactic structure in focus was differential object marking (DOM). DOM is found in Spanish, but not in English or in BP. The authors found that at the initial stages, participants from the mirror image language groups patterned alike. For the L3 beginners, the authors recorded multiple non-target like responses. This may be indicative of initial transfer from the non-facilitative, but typologically more similar language, Spanish. The results from the advanced L3 learner groups were different from each other: while the L1 Spanish L3 BP advanced proficiency group patterned with the initial stage groups, the L2 Spanish advanced L3 BP speakers performed more accurately and comparable to the L1 BP control group. According to the authors, these results suggest that during the initial stages of acquisition the

role of L1 or L2 may not be a determining factor for transfer, while at later stages of L3 development it does seem to matter whether it is the L1 or the L2 causing non-facilitative transfer. The divergence of trajectories between the two advanced L3 learners (i.e. the L2 Spanish group patterning like the native control group while the L1 Spanish group patterning with the initial stages L3 groups), indicates that the status of the previously acquired language (L1 or L2) becomes a factor at later stages of development. The authors theorize that the increased persistence of non-facilitative influence from L1 can be due to the fact that L1 cumulative input outweighs the amount of L2 cumulative input in a learner's mind even at higher L2 proficiency levels. A greater amount of L1 input (compared to L2 input) requires a greater amount of L3 input to override dissimilar morphosyntactic structures and acquire a target-like L3 grammar. The findings of the study suggest that frequency and relative proportions of linguistic input are important factors affecting cross-linguistic influence. While the data support the CITH, the authors discuss two further factors that might have influenced the results. The L2 Spanish advanced BP group was tested in an immersion context (while the L1 Spanish group was tested in the U.S.) which could have contributed to increased input in BP which in turn could have led to faster target-like performance. The Spanish L2 advanced group also had more metalinguistic knowledge than the L1 Spanish advanced group as they learned Spanish in a classroom setting where DOM is actively taught.

In this section, I presented a variety of theories present in the field of L3A and the empirical evidence these models have found to support their hypothesis. Theoretical investigations into L3A aim to explain cross-linguistic influence in the L3 acquisition process based on investigations of a broad variety of syntactic structures and language pairings. The next section discusses research and theories specifically dedicated to the acquisition of verb placement, as the structures under investigation in the present study focus on verb placement. First, the acquisition of verb placement in the L1 context, then the L2 context and finally the L3 context is reviewed.

3.2 Acquisition of verb placement in L1, L2, and L3

Previous research on child language acquisition (Snyder, 2007) has found that children exhibit "grammatical conservatism" in their spontaneous speech. Economy seems to play an important role in L1 acquisition and children generally do not perform verb movement unless it is confirmed in the input - likely because it is costly to perform the movement operation (Chomsky, 1995). Studies on the acquisition of L1s exhibiting the V2 phenomenon found that once children start producing finite verbs, their word order is largely target-like (Poeppel & Wexler, 1993) and errors are the result of undergeneralizations (lack of verb movement) rather than overgeneralizations (overuse of verb movement; see Waldmann, 2012). This tendency speaks for the idea that in L1 acquisition economy plays an important role.

Verb placement in the L2 acquisition context on the other hand has been found to be less conservative. Studies have found that verb placement patterns largely follow those found in the respective L1s (Westergaard, 2003, Johansen, 2008). If the L1 is a V2 language, movement of the finite verb to C is likely transferred to the L2 regardless of whether the L2 is a V2 language or not. Equally, if the L1 does not exhibit the V2 phenomenon these learners transfer non-movement to the L2. L2 learners appear to transfer verb placement paradigms from their L1. Relevant for this study are also the findings from studies by Westergaard (2002, 2003) that when young Norwegians transfer the V2 word order of Norwegian main clauses to their L2 English they show more prominent and lasting transfer effects for structures with habitual adverbs than for topicalizations (non-subject-initial declaratives).

The source of cross linguistic influence on the acquisition of verb placement in the L3 context is still a debated issue. Studies have found possible cross-linguistic influence from both, the L1 and the L2. A study by Bardel and Falk (2007) argues that transfer proceeds from the L2 due to cognitive similarities between L2 and L3. The study investigated verb placement in structures involving sentential negation by two learner groups acquiring a V2 language as their L3. In V2 languages the verb raises above negation while in non-V2 languages the negation precedes the finite verb. The difference between the two groups was that one group's L1 was a V2 language and their L2 a non-V2 language and the other group's L1 was a non-V2 language while their L2 was a V2 language. The study found that the group whose L1 was

a V2 language predominantly placed the negation post-verbally (in a non-target-like fashion) while the group whose L2 was a V2 language more frequently placed the negation pre-verbally (which was target-like). On the other hand, a study by Stadt et al. (2020) suggests transfer from the L1 in the acquisition of verb placement in an L3. The investigation included two morphosyntactic structures: non-subject initial declaratives and adverb placement. The languages under investigation were L1 Dutch, L2 English, L3 French. Non-subject initial declaratives present an example of a linguistic mismatch between Dutch and French, but a linguistic match between English and French. Adverb placement on the other hand is an example of a mismatch between English and French while the surface word order presents is a match between Dutch and French. Non-target like judgements of non-subject initial declaratives would suggest cross-linguistic influence from L1 Dutch while non-target like judgements of sentences with sentence-medial adverbs could indicate transfer from L2 English. The results of this study showed that participants performed significantly less accurately when judging non-subject initial declaratives as compared to sentences with adverbs. The authors conclude that the significantly higher error rate in judging non-subject initial declaratives as compared to adverb placement are compatible with L1 transfer.

The two studies presented above have found both a) a tendency to not move verbs and b) non-target verb movement. The studies attribute their results to predominant transfer from one of the previously learned languages (the L2 or the L1, respectively). The studies do not agree on whether it is the L1 or the L2 that is the selected source of transfer.

Subsequent studies (Dahl et al., 2022; Listhaug et al., 2021) argue that cross-linguistic influence in L3 is not based on wholesale or predominant transfer from one previously acquired language, but rather proceeds property-by-property and cross-linguistic influence of both previously acquired languages is possible. In the study conducted by Listhaug et al. (2021) two sentence types were investigated: non-subject initial declaratives and adverb placement. The languages examined were L1 Norwegian, L2 English and L3 French. Non-subject initial declaratives are a linguistic mismatch between Norwegian and French as Norwegian is a V2 language that requires the finite verb to raise to C while in French the finite verb only moves to I resulting in a V3 word order for this structure. Non-subject initial declaratives have a matching surface word order (V3) in English and French. Adverb placement results in the same surface word order between Norwegian and French as the finite

verb takes the second constituent position, while English maintains the V3 word order also in this condition. The study included five participant groups. The participants were high school students in year one, two, four and five of L3 French and university students of L3 French. The participants at early stages of L3 acquisition (year 1 and 2) generally accepted and rejected V2 and V3 word orders equally as often and did not show a clear preference for either word order. Given this lack of preference, the authors conclude that there is no evidence of wholesale transfer of one of the previously acquired languages at the initial stages of L3 acquisition. Interesting is also that while the judgements on neither condition showed a preference for either word order, the adverb placement condition (which requires verb movement) was judged in a non-target-like manner more frequently than the non-subject initial declaratives condition which does not require verb movement for the correct surface word order to emerge. Furthermore, the authors found that the trajectory towards target-like judgement varied for the two sentence types under investigation. While there was a significant difference in judgement on grammatical V3 vs. ungrammatical V2 with non-subject initial declaratives in learners at year four, five and at the university level, for sentences with sentence adverbials there were significant differences on judgement on grammatical V2 vs. ungrammatical V3 only in learners at university level. It appears that the structure which does not require verb movement is more easily acquired. The results of this study are similar to the findings of study "The role of L1 Norwegian and L2 English in the acquisition of verb placement in L3 German" (Dahl et al., 2022). The results of this study also did not find evidence of L1 or L2 transfer at early stages of L3. And, as in the study discussed above, they also found that at later stages the L3 learners' development towards target-like judgement did not follow the same trajectory for the two structures under investigation.

A study conducted by Stadt, Hulk, Sleeman (2016) investigated whether L1 Dutch or L2 English has a stronger influence on L3 French regarding verb placement. The study employed a grammaticality judgement task (GJT) to measure acceptance of the target structures in the L3. There were two structures under investigation. The first one is a linguistic match between L1 Dutch and L3 French and mismatch with L2 English. Sentences with adverbs follow a V2 pattern in Dutch and French and V3 in English. Non-subject initial declaratives were the second structure in focus. This structure presents a match between L2 English and L3 French that both exhibit a V3 word order and a mismatch with Dutch as it exhibits the V2 word order in these sentence types. The GJT in French consisted of 14 items (seven grammatically

correct/seven incorrect) for structure one and 14 items for structure two (also half of them being grammatically correct and the other half being incorrect) as well as 17 filler items. The authors were focused on examining possible negative transfer (non-facilitation), as the participants were intermediate L3 learners. The authors predicted negative transfer from English to French in the condition adverb placement and no negative transfer from Dutch to French in the condition non-subject initial declaratives. The authors tested 27 participants aged 13-16 years. 16 of the participant group learned English through immersion and 11 had English as a regular subject in school. All participants were intermediate learners of L3 French. I will focus on the regular (non-immersion) students' results as these participants are more like the participants in my study. The results for the 'regular-curriculum' students were not in-line with the authors predictions. The results indicated no significant preference for V2 or V3. The participants of the non-immersion group (mis)judged both structures with no significant difference between them. The lack of a visible preference for V2 or V3 word order, was interpreted as lack of evidence for wholesale transfer, but in-line with the LPM (Wetsergaard et al., 2017). The results may be compatible with the proposal that both previously learned grammars are available to the parser and influence the acquisition of the (new) L3 interlanguage grammar. There was also no significant difference in how these participants who were at an intermediate level of L3 French judged the two structures under investigation.

The study "The role of L1 Norwegian & L2 English in the acquisition of verb placement in L3 German" (Dahl, et al. 2021) aimed to investigate cross linguistic influence as well as L3 developmental trajectories and the influence of L2 proficiency in the acquisition of L3 verb placement. The participants in this study were high school students whose L1 is Norwegian, L2 English and who have had one, two, four or five years of exposure to L3 German. Participants included in the data set did not have any intermediate or advanced knowledge of languages other than the three mentioned above nor did they have a diagnosis that might have affected language acquisition (e.g. autism, DLD etc.). Participants' school grades as well as a self-assessment were used as a proxy of proficiency. The study collected AJT data in English and German to examine potential transfer effects from the L1 and the L2. The structure under investigation, finite verb placement, follows the same pattern in German and Norwegian, but is different in English. For this structure, target-like performance would suggest transfer from L1 Norwegian, while non-target-like judgements may suggest transfer from the L2 English.

Undecided judgement, i.e. no clear preference for V2 or V3 word order might suggest an interlanguage grammar that has not chosen one or the other languages available for transfer, but rather maintains access to both grammars until sufficient L3 input is gathered to derive the appropriate word order pattern. The AJTs in L3 German and in L2 English each contained 48 items. Half of the items were fillers of which half were grammatical and the other half ungrammatical sentences. In addition to fillers, there were 24 target items. The target items were sentences with sentence-medial adverbs and non-subject-initial declaratives (topicalized structures). The target items consisted of six topicalized sentences displaying V2 word order and six topicalized sentences displaying V3 word order. The remaining 12 target items were sentences with verbal modifiers (adverbs) of which again six followed the V2 word order and six had the V3 word order. The English and the German test items were not lexically identical, however, structurally they were similar, all being declarative main clauses comparable in complexity/simplicity. The results of the AJT in German showed that the L3 learners both as a group and individually in their first and second year had no preference for either V2 or V3 word order. These results speak against wholesale transfer from the L1. Wholesale transfer from L1 would have led to target-like performance from the beginning. The uncertainty regarding V2/V3 can also be due to the potential availability for transfer of structures from both previously learned languages, as the full transfer potential hypothesis (Westergaard, 2019) proposes. The parser has not yet had enough telling input to decide which previously learned language is more like German with respect to the relevant structure. Participants in year four and five on the other hand, showed a preference for grammatical V2 over ungrammatical V3, but the development toward target-like word order for the two structures under investigation did not correlate. Participants in year four and five judged items with sentence-medial adverbs more target-like than items of non-subject initial declaratives. This indicates that more L3 exposure leads to improved target-like performance and that evidence of transfer was not equal for both sentence types. Furthermore, the data suggested that higher scores on the English AJT correlated with higher accuracy on the German AJT, even though English follows a V3 word order and German a V2 word order. This result may indicate that when the structures under investigation had been successfully acquired in English, the non-facilitative influence on L3 German may decrease. The authors also found that higher self-rated proficiency correlated with more target-like performance across all groups of participants, suggesting that cross-linguistic influence from the L2 (if at all present)

becomes less pronounced with increasing L3 proficiency. This could be due to the improved ability to inhibit transfer from English at higher proficiency levels or be the result of individual factors that made it easier to acquire the L2 (e.g., language learning ability, analytical ability, meta-linguistic awareness etc.) also showing an effect in the L3 acquisition. The authors concluded that they found no evidence of wholesale transfer of either L1 or L2 at the early stages of L3 acquisition.

This study leads me to the next section where I review in more detail previous studies focusing on the trajectory of L3 acquisition and the role of economy as a potential factor for the source of cross-linguistic influence.

3.3 The Role of Language-Internal Factors

Busterud et al. (2023) investigate to which degree underlying language specific syntactic properties are a factor for cross-linguistic influence and if economy plays a role in the L3 acquisition process. In the study the authors examined two L3 learner groups with different L3s. The participants' L1 is Norwegian, the L2 is English, and they are acquiring either German or French as their L3. The syntactic structure under investigation was verb placement in non-subject initial declaratives and adverb placement declaratives. In English, lexical verbs remain in VP which results in a V3 surface word order for both structures mentioned above. In French, the lexical verb undergoes short movement from V to I. This results in an overt V3 worder for non-subject initial declaratives, but V2 word order for declaratives with adverbs. In German and Norwegian, finite verbs undergo long movement from V to I to C. This results in an overt V2 word order for both non-subject initial declaratives as well as adverb placement. Regarding these sentences, the underlying structure in English is the least costly option in terms of movement as the lexical verb stays in-situ at V, the French underlying structure is more costly than the English one as the finite verb must undergo short movement from V to I, and the underlying structure in German and Norwegian is the costliest option because finite verbs have to go through long movement from V to I to C. In the study, the authors analyzed data from an AJT containing grammatical and ungrammatical items of the structures in the respective L3s. The results showed that L3 learners of French performed

more accurately in the structure non-subject initial declaratives than the L3 German group. The L3 German learners showed a tendency to judge items containing adverb placement more accurately than the non-subject initial declarative items. The authors propose that this can be because the correct overt word order in adverb placement only requires short movement of the finite verb to I which is less costly than long movement to C which in turn is necessary to derive the correct word order of non-subject initial declaratives in German. The authors concluded that the use of English-like structures may not be due to the order of acquisition, but rather due the properties of English itself i.e., that the underlying structure of English is the least costly and most economical option. The authors hypothesize that the underlying language specific syntactic properties and through them economy is a factor for cross-linguistic influence. This proposal is also in-line with the results Dahl et al. (2022) and Listhaug et al. (2021) found.

To sum up, the studies reviewed above do not show a consensus on the source or the extent of transfer of L1/L2 in the L3 acquisition process. Further empirical research is necessary to provide answers to the questions of source and mode of transfer in L3A.

4 Research questions & predictions

4.1 Research questions

This study which investigates verb placement in L1 Norwegian speakers acquiring L3 German in a classroom setting with English as L2, aims to answer the following research questions:

RQ1: Is there evidence of property-by-property transfer of both available languages, L1 and L2, or rather of (wholesale) transfer of either L1 or L2 in the acquisition of V2 in adverb placement and non-subject initial declaratives in the early stages of L3 acquisition?

RQ2: Is there an overall effect of sentence type (habitual adverbs and non-subject initial declaratives) on accuracy in judgement of verb placement in L3 German development when comparing test time one to test time two?

RQ3: Which factors determine the source of cross-linguistic influence in the acquisition of morphosyntactic structures in L3?

4.2 Predictions

As for both properties under investigation the L1 and the L3 pattern together, while the L2 does not, target-like responses would indicate wholesale transfer from the L1 while across the board non-target-like responses would suggest wholesale transfer from the L2. The absence of a preference for either V2 or V3 word order poses the lack of evidence for wholesale transfer and speaks for the availability of both previously learned languages as a potential source of cross-linguistic influence. Furthermore, divergent trajectories of the accuracy rates concerning the two structures strengthens the argument for cross-linguistic influence in the L3 acquisition process of morphosyntactic properties to occur property-by-property rather than wholesale. A different rate towards target-like performance across the structures suggests that in the process of L3 acquisition all prior linguistic knowledge is activated. The parser distinguishes between linguistic properties, and cross-linguistic influence can vary property-by-property. The properties under investigation require different extents of operations in the language pairings. L2 English has the least marked underlying structure as lexical finite verbs in declarative sentences remain in V. No movement is necessary for the correct surface form to emerge. L1 Norwegian as well as L3 German since they are both V2 languages require the finite verb in declarative sentences to undergo movement for the correct surface word order to result. Although in Norwegian and German, both sentence types under investigation adverb placement and non-subject initial declaratives are explained by a symmetric account for the V2 phenomenon to undergo movement from V to I to C other, asymmetric accounts (Westergaard et al., 2019) suggest two separate accounts for V2 in the two structures. Non-subject initial declaratives must raise the verb to C for the correct surface word order to result. Sentences of the type adverb placement on the other hand can produce the correct surface

word order also if the verb only raises to I in the underlying structure. As stated above, both adverb placement and non-subject initial declaratives require verb movement in L3 German. The assumption is that both structures have an underlying form where the finite verb raises from V to I to C in order to result in the V2 surface form. The two structures nonetheless differ slightly as in adverb placement the verb does not have to raise above the subject while in non-subject initial declaratives the verb must raise above the subject for the correct surface word order to emerge. It can be said that V2 in non-subject initial declaratives is a more costly operation than V2 in adverb placement in German. A higher accuracy rate in the condition adverb placement as compared to the condition non-subject initial declaratives strengthens the notion that economy is a considerable factor for cross-linguistic influence in the acquisition of morphosyntactic structures.

H1: Based on previous findings (Dahl et al. 2022) on the same language combinations, I expect to find no evidence of wholesale transfer of one previously acquired language, but support for the notion that grammars of both previously acquired languages are co-activated in the acquisition process of L3 morphosyntactic properties.

H2: I predict based on the findings of the studies mentioned above (Dahl et al. 2022), to find an overall effect of sentence type on accuracy in judgement of verb placement in L3 German when comparing test time one to test time two. I expect to find divergent acceptability rates for the two structures and support for property-by- property cross-linguistic influence.

H3: Based on previous findings (Busterud et al. 2023) on the same morphosyntactic structures, I expect to find evidence of economy being a significant factor for cross-linguistic influence in the acquisition of morphosyntactic structures in L3.

5 Methods

In this chapter, I present the language learners who participated in this study and the methodology used.

5.1 Participants

Table 4 provides a description of the participants. Participants in the target L3 group were high school (16–17-year-old) students (N=14) who have studied German at school in Norway. They belonged to a class of 26 students who had one and half hours of German lessons twice a week (length of exposure). At test-time one (December 2021), the participants had had three and half months of German lessons (42 lessons) and at first measurement estimated their German proficiency at an average of 2.6 on a five-point scale. This participant group was in the early stages of L3 acquisition. The same participant group (+3, N=17) was tested one year later in the classroom. At this point the participants had had approximately 103 lessons (155 hours) of German instruction and rated their L3 proficiency at an average of 2.64. As the teacher of these students/participants I would place them on average at an A2 level at test time two. The group was homogenous in length of exposure.

Table 4: Participant demographics

	Target language	**Native language**	**L2**	**N**	**Age range at Testing in years (Mean)**	**Length of exposure**
Test time one	L3 German	Norwegian	English	14	16-17 (16;6)	42 hours (3 ½ months)
Test time two	L3 German	Norwegian	English	17	17-18 (17;6)	155 hours (one school year plus 3 ½ months)

5.2 Materials and procedures

The project has been registered and approved by the Norwegian Centre for Research Data (Sikt) and participation was voluntary. All tests were web-based experiments programed in

Gorilla Experiment Builder (Anwyl-Irvine et al. 2019). The study included three types of tasks: a language background questionnaire, a vocabulary task, and an acceptability judgement task (AJT) in German and in English. The same set of tasks was administered at two different testing times (December 2021 & December 2022). Both groups began the experiment with the AJT in the target language German (to avoid priming effects from English) and with the idea of maximizing students' concentration. By using the AJT, I aimed at tapping into the learner's mental representation of the developing target language. An AJT is an appropriate method to investigate the acquisition of syntax especially at early stages, as any structure can be used and participants do not need to produce the language themselves but rather judge whether a sentence sounds correct or incorrect to them, thus minimizing potential performance interference. A potential drawback of an AJT is that the learner may be judging something else in the sentence than the actual target. To minimize this potential problem, target sentences were kept as short as possible and the lexicon was elementary, i.e., only including high frequency words which also appear early on in the textbooks used in class. The test items appeared in an order that was unique and randomized for each participant. Furthermore, by creating two minimally different versions of the sentence (one grammatical and one ungrammatical, where we only manipulated the morphosyntactic property in question), and by examining participants' judgements of them we could isolate the reactions to the grammatical property in question.

5.2.1 Acceptability Judgement Task (AJT) in L3 German

The AJT in German contained sixty sentences that targeted five different structural conditions. Table 5 presents example sentences used in the German AJT. The complete set of sentences used in the German AJT can be found in appendix 1. The structures reflect a variety of cross-linguistic (mis)matches across the three languages.

This study focuses on two of these conditions which both probe into the placement of the finite verb and are both surface-structural matches between Norwegian and German - which in-turn do not match English word order. In German and Norwegian main-clauses, non-

subject initial declaratives (or topicalized sentences) require the finite verb to move from I to C creating a surface word order where the finite verb comes in second position, in-front of the subject (V2). In English, on the other hand, non-subject initial declaratives do not require verb movement, the finite verb remains in situ. This produces a surface word order where the finite verb follows the subject and is the third constituent in the sentence (V3). The second structure in focus is adverb placement in subject initial declaratives. Again, German and Norwegian place the verb in second position with the adverb following the finite verb (V2). On the other hand, English places the adverb in front of the finite verb, resulting in a word order with the finite verb as the third constituent in the sentence (V3). The participants in this study could therefore experience facilitation from L1 Norwegian and/or non-facilitation from L2 English in the L3 German acquisition process.

The other items included in the experiment served as fillers / control conditions. There were three such control conditions: 1) the verb-object word order condition, which is a match between Norwegian and English, and different from German; 2) the use of a determiner in generic context, which is a linguistic match for English and German, and a mismatch with Norwegian; 3) the possessive determiner placement, which is a match between all three languages (with Norwegian allowing both pre- and post-noun positioning). The following table gives examples of the conditions of the AJT.

Table 5: Conditions and examples of experimental items in German AJT (cf. Kolb et al. 2021, and in prep.)

Sentence Type	**Norwegian**	**English**	**German**	**Condition**
Non-subject-Initial Declaratives	**XP-V-S** *På mandager går Anna til restauranten.*	**XP-S-V** *On Mondays Anna goes to the restaurant.*	**XP-V-S** *Montags geht Anna ins Restaurant.*	**NOR = GER ≠ ENG**
Adverb Placement	**V-Adv** *Daniel møter ofte venner.*	**Adv-V** *Daniel often meets friends.*	**V-Adv** *Daniel trifft oft Freunde.*	**NOR = GER ≠ ENG**
Filler and control items				

Word Order Verb-Object	VO *Denis kan spille spillet.*	VO *Denis can play the game.*	OV *Denis kann das Spiel spielen.*	**NOR = ENG ≠ GER**
Determiner use in Generic Context	ØN *Han har hus.*	DetN *He has a house.*	DetN *Er hat ein Haus.*	**ENG = GER ≠ NOR** **(=NOR in certain context)**
Possessive Determiner Placement	Post- and pre-nominal *Mora mi er ung.* *Mi mor er ung.*	Pre-nominal *My mother is young.*	Pre-nominal *Meine Mutter ist jung.*	**ENG = GER** **≠ NOR and = NOR**

There were twenty-four target-sentences distributed across the two conditions under investigation, twelve test items per condition. Test items appeared in a randomized order. Six of the items per condition were ungrammatical and six were grammatical. The sentences were presented both visually and orally. A native speaker of German pre-recorded the sentences with a natural declarative prosodic contour. The visual representation of the sentences was an important addition to the written stimuli on the screen. The participants heard each sentence once and had to mark it as either grammatical or ungrammatical by clicking on a red x or a green checkmark presented on the screen. The AJT started with a training session consisting of two items. (8) and (9) below are examples of test sentences of the target condition non-subject initial declaratives. (10) and (11) are examples of the test sentences of the target condition adverb placement. Examples (5) through (10) are example sentences of the three filler item conditions.

(8) Am Samstag tanzt Laura im Garten.

AdvTemp PRS3SG SGName AdvLoc

* 'On Saturday dances Laura in the garden.'

(9) *Am Samstag Laura tanzt im Garten.

AdvTemp SGName PRS3SG AdvLoc

‘On Saturday Laura dances in the garden.’

(10) Daniel trifft oft Freunde.

SGName PRS3SG AdvFreq PL

* ‘Daniel meets often friends.’

(11) *Daniel oft trifft Freunde.

SGName AdvFreq PRS3SG PL

‘Daniel often meets friends.’

(12) Dennis kann das Spiel spielen.

SGName 3SGMODAL DETn SG INF

* ‘Dennis can the game play’

(13) *Dennis kann spielen das Spiel.

SGName 3SGMODAL INF DETn SG

‘Dennis can play the game’

(14) Sie hat einen Pass.

3SG PRS3SG DETmAkk SG

‘She has a passport’

(15) *Sie hat Pass.

3SG PRS3SG SG

* ‘She has passport’

(16) Meine Mutter ist jung.

POSS SG PRS3SG ADJ

‘My mother is young’

(17) * Mutter meine ist jung.

SG POSS PRS3SG ADJ

* ‘Mother my is young’

(8) and (9) are examples of the condition non-subject initial declaratives. All sentences in this condition include a temporal adverbial phrase, 3SG subject (proper noun), present tense indicative verb in 3SG, and a locative adverbial phrase.

(10) and (11) illustrate the condition adverb placement in subject initial declarative clauses. The sentences of this condition used in the AJT all consist of a 3SG subject (proper noun), an adverb of frequency, a present tense indicative verb in 3SG and a plural noun.

Examples (12) through (17) are representations of the filler items. (12) and (13) illustrate word order in the OV-VO condition. All sentences in this condition have a 3SG subject (proper noun), a modal verb “can” in 3SG, a lexical verb in the infinitive form and a count noun in the object position. The condition determiner use in a generic context is illustrated in (14) and (15). (16) and (17) are examples of the condition placement of possessive determiners. All items in this condition use a singular noun, a possessive determiner, the verb ‘to be’ conjugated in third person singular present tense indicative and an adjective.

5.2.2 Acceptability Judgement Task (AJT) in L2 English

The AJT in English contained a total of 30 items, six items per condition, three grammatical and three ungrammatical[2]. The items in English followed the same pattern as the items of the German AJT, except, of course, that English target-like responses are those which have V3 word order (and not V2) for the conditions non-subject initial declaratives and adverb placement. The following are example items of the conditions adverb placement and non-subject initial declaratives:

(18)	Michael	often	meets	friends.
	SGName	AdvFreq	PRS3SG	PL
(19)	* Daniel	meets	often	friends.
	SGName	PRS3SG	AdvFreq	PL
(20)	On Mondays	Anna	goes	to the restaurant.
	AdvTemp	SGName	PRS3SG	AdvLoc
(21)	*On Mondays	goes	Carla	to the restaurant.
	AdvTemp	PRS3SG	SGName	AdvLoc

The AJT in English was primarily included in the experiment to see if the structures under investigation had been acquired in L2 English and if CLI from English would be in the expected direction. I was also interested in the question of whether participants acquisition of these structures in L3 German followed the same or a different trajectory than in L2 English.

[2] Due to a coding error the condition adverb placement had a ratio of 5 grammatical items to 1 ungrammatical item in the English AJT.

5.2.3 Vocabulary proficiency task

After finishing the AJTs, the participants completed the Peabody Picture Vocabulary Task (PPVT-4) (Eigsti, 2017), which was used as a proficiency measure in L3 German. This task served as a general measure of proficiency and a proxy of lexical development in L3 German. The task contained a total of 228 items. In each trial, the participants saw images of four distinct items on the screen (see Figure 2). One of the items was named auditorily. The participants' task was to click on the item they believed matched the word they just heard. Once they had clicked on an image, the next screen with four new items appeared. The task ended after four consecutive errors. Figure 2 shows an example of what participants saw on the screen. It is a screen shot taken from the PPVT-task.

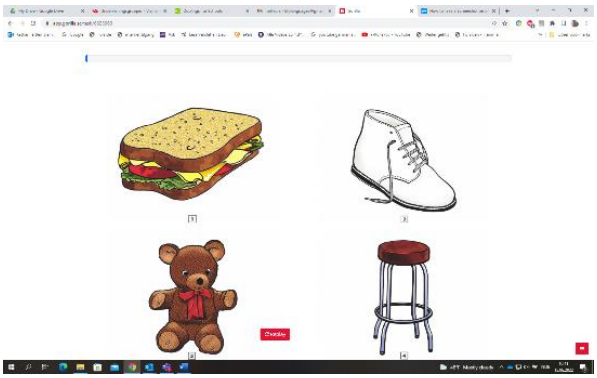

Figure 2: Example of the vocabulary proficiency task

In this item, the participants saw the four images and hear the word "Schuh" /shoe. If they clicked on the image showing the shoe their response was recoded as correct / target-like. If they clicked on any of the other three images the response was recorded as incorrect / non-target-like.

5.2.4 Background questionnaire

As the final task in the experiment, participants' background data were collected. Participants were asked to indicate their age and gender. They were also asked to answer language background questions about previously acquired languages, how much and in which context these languages (if any) were used, as well as provide self-rated proficiency in all the languages they spoke. Participants also reported their length of exposure to L3 German, and self-rated L3 proficiency.

As the first round of the experiment was conducted during a Covid-19 related school closure, participants completed the experiment at home. The second time around, one year later, the experiment was conducted at school during school hours. This difference may be one of the reasons as to why only 14 participated at test time one while 17 participated at test time two (in school).

6 Results

In this chapter, I present the results of the experiment. First, I discuss the background data, then give the German AJT results, followed by the results of the English AJT and finally the PPVT results.

6.1 Background data

I used participants' responses to background questions to check if any of the candidates did not meet the inclusion criteria to the study. The main exclusion criterion was the following: L1 other than Norwegian (this was necessary to control for CLI from Norwegian and English only). Based on this criterion, two participants had to be excluded from the study both from

test time one and two as they indicated that their L1 was not Norwegian, but Finnish and Swedish respectively.

Several participants reported exposure to an additional language (other than Norwegian and English), however most reported a very low self-rated proficiency of two or one on a scale of one to five where five was (near)native-like. I reasoned however that at a low proficiency level the activation of these additional languages would potentially be very low and it will therefore be unlikely that the participants would experience CLI from languages other than their two more 'active' languages that they use a lot in their daily life, namely Norwegian and English. The results of the participants in this group patterned together with the rest of the group, this is why we took the executive decision to include them in the final dataset. One participant reported a proficiency of 4 of 5 in Danish and was excluded from the study (it should be noted however, that since Danish is similar to Norwegian in the examined properties, it may have been possible to include this participant as well, however, since we could not have controlled for additional variables associated with high-level Danish proficiency, such as exposure to German through a different school system, we decided to exclude this participant). The final number of participants included in the study was N=14 at test time one and N=17 at test time two.

6.2 L3 German

I start by presenting the overall accuracy by target conditions at test time one (2021) and test time two (2022) for the L3 German AJT. An accurate response to an item is assigned the numerical value of one and an inaccurate response is assigned the value of zero. A target-like response is indicated by high accuracy of correct assignments of grammatical and ungrammatical responses (also overall accuracy) and which in the context of the present study suggests transfer from L1 Norwegian. Non-target like performance is reflected in low accuracy scores and suggests transfer from L2 origin. No-preference patterns – i.e., no statistical difference between the amount of correct and incorrect responses – suggests potential availability of both L1 and L2 for transfer or general insecurity with respect to the

structure in question. Figure 3 below illustrates the German AJT results: overall accuracy by target condition and test time.

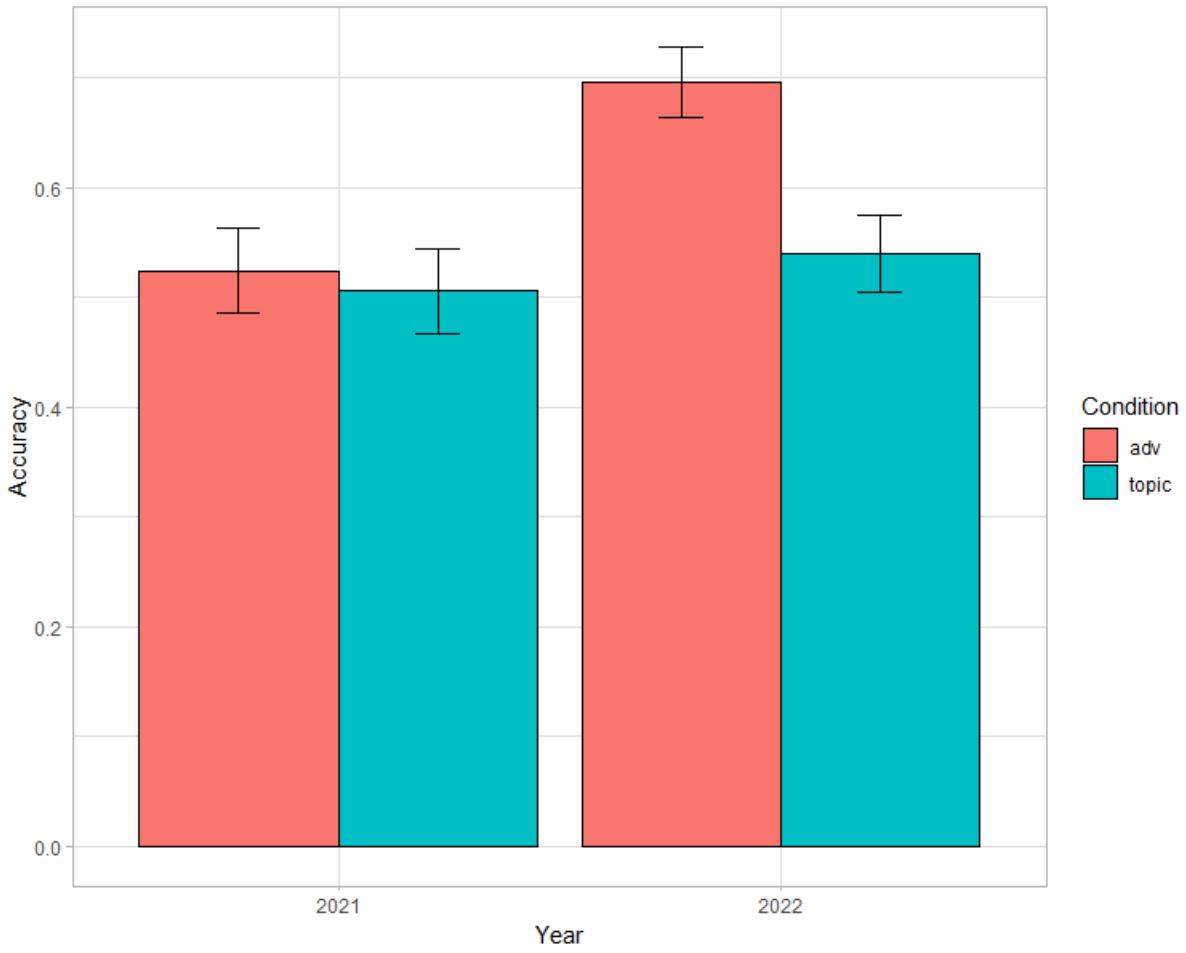

Figure 3: Overall L3 accuracy by target conditions and test time

As illustrated in Figure 3, at test time one (labelled as "2021") the participants' overall accuracy on both target conditions is at chance level. This means that in general the participants did not favor one specific word order (V2 or V3) over the other. Both target conditions, adverb placement (labelled "adv") and non-subject initial declaratives (labelled "topic") have an accuracy rate of approximately 50%. While the accuracy rate of the sentence type adverb placement is numerically slightly higher than the accuracy rate of items containing non-subject initial declaratives the difference is not statistically significant (see the results of statistical modelling below). At test time two (labelled as "2022") the data shows that for the condition adverb placement participants accuracy rate is higher. Participants judgement of non-subject initial declaratives, on the other hand shows no substantial

difference in accuracy rate from test time one to test time two. At test time two, the judgement of non-subject initial declaratives seems to remain at chance.

To analyze the results statistically, we fit a mixed effects logistic regression model predicting response Accuracy by the interaction between Condition (Adv and Topic) and Year. Participants and Items were included as random intercepts (model comparison revealed that the model with random intercepts is not worse than a model with a more complex random effect structure). The model revealed a significant effect of Year in the Adv condition and a significant interaction between Condition and Year. No other effects were significant.

We ran post-hoc pairwise comparisons with adjusted alpha levels on this model, comparing Conditions by Year, and Years by Condition. The following contrasts were significant:

1) The difference between Conditions is not significant in 2021, but in 2022 Accuracy in the adverb placement (Adv) condition is significantly higher than in the non-subject initial (Topic) condition.
2) There was a significant improvement in Accuracy in the Adv condition between 2021 and 2022, but not in the Topic condition.

Next, to assess statistical differences between the responses in grammatical and ungrammatical trials separately, we fit two bimodal generalized linear mixed effects logistic regression models, where the probability of accepting the trial as grammatical was modeled by an interaction of test time and condition, with participants and items taken as random intercepts. Post hoc pairwise comparisons of groups within conditions for the grammatical trials revealed that at test time one there is no significant interaction of grammaticality and condition. There is however a significant difference between the two conditions at test time two. At test time two, participants judged ungrammatical sentences of the condition adverb placement significantly more accurately than those of the condition non-subject initial declaratives. Grammatical adverb placement items are judged marginally more target like as compared to grammatical items of the condition non-subject initial declaratives. There is also one significant interaction by test time. At test time two ungrammatical items of the condition adverb placement have significantly higher accuracy rate than they did at test time one. The acceptance rate of grammatical items for both conditions does not significantly change form test time one to test time two. There is a numerically observable shift towards target-like

responses from test time one to test time two regarding the rejection of ungrammatical items in the condition non-subject initial declaratives, but with a p. value of 0.1 the change does not reach statistical significance (see Appendix 2). Figure 4 below illustrates acceptance of grammatical items and rejection of ungrammatical items by condition and test time.

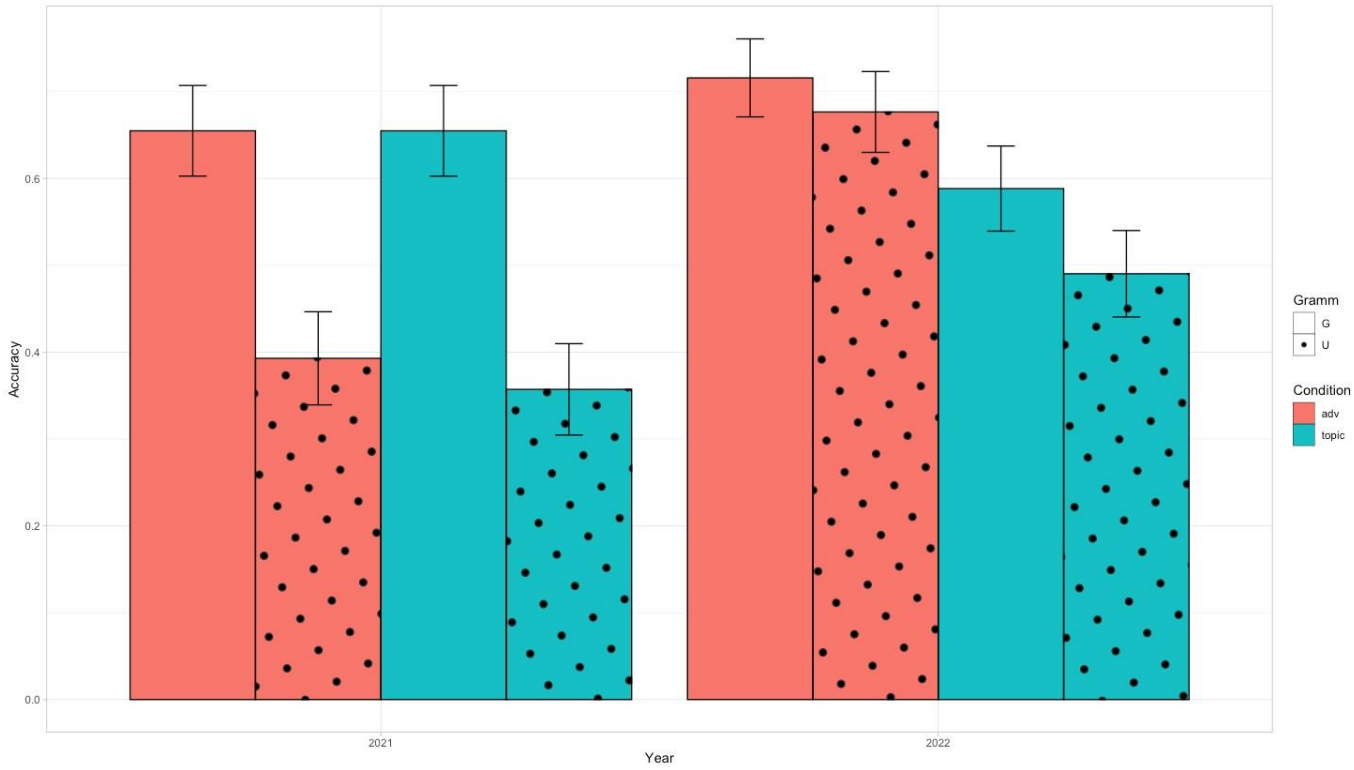

Figure 4: L3 accuracy by target condition, test time and by grammaticality

Figure 4 summarizes the results of the German AJT at test time one (2021) and test time two (2022) by accuracy, target condition and by grammaticality. As evident from Figure 4, at test time one (2021) the ungrammatical items have a lower accuracy rate than the grammatical items. This means that the participants accepted ungrammatical items when they should have rejected them more frequently than that they rejected grammatical items. The discrepancy in accuracy between grammatical and ungrammatical items at test time one suggests that the participants have a relatively strong "yes" bias. At test time two participants have rejected ungrammatical items more frequently than at test time one in both conditions. They rejected ungrammatical items of the condition adverb placement significantly more often than they did at test time one.

In the next part, I present the results for the complete AJT in German. This is provided just for illustrative purposes, the results from filler conditions will not be taken up in the discussion. The German AJT included five conditions. The two target conditions for this study, adverb placement (adv) and non-subject initial declaratives (topic) as well as three filler conditions: Determiner use in generic contexts (generic), possessive determiners (possessive) and object-verb order (object). The bar graph (Figure 5) illustrates the results of the German AJT by accuracy, year and condition. To analyze the results of the complete German AJT (target conditions and filler items) we fit a model with random slopes by condition for participants and random intercepts by items. We got a singular fit warning, so we fit a simpler model with only random intercepts by participant and item. We compared the simpler model to the more complex model which showed that the simpler model was not significantly worse than the more complex model. Then we performed pairwise comparisons between conditions by grammaticality and year, and between grammatical vs ungrammatical items by condition and this year. This revealed a significant effect of year in the adverb placement condition, also a significant difference between adverb placement vs generic and adverb placement vs possessive conditions in test time one, and a significant interaction between condition and test time (see appendix 2, Table 10).

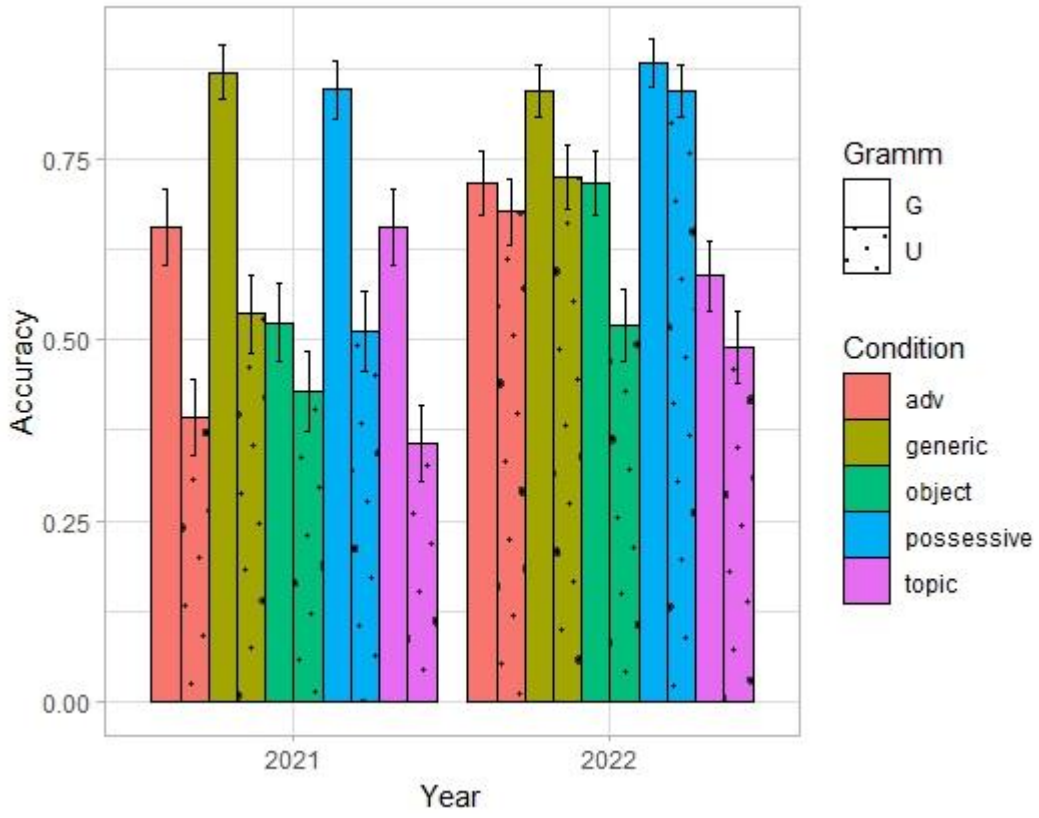

Figure 5: Accuracy on the complete German AJT by grammaticality, test time and condition

Figure 5 summarizes the overall accuracy rate per condition per test time. There was a significant improvement in accuracy in all conditions except the condition non-subject initial declaratives (labeled as "topic" in the graph) between test time one and two. There is no significant difference in accuracy regarding the condition non-subject initial declaratives from test time one to two (see appendix 2, table 10 for the statistical analysis of the complete AJT in German).

6.3 L2 English

The results of the AJT in English are presented next. The graph illustrates the results per condition (adverb placement and non-subject initial declaratives) and test time.

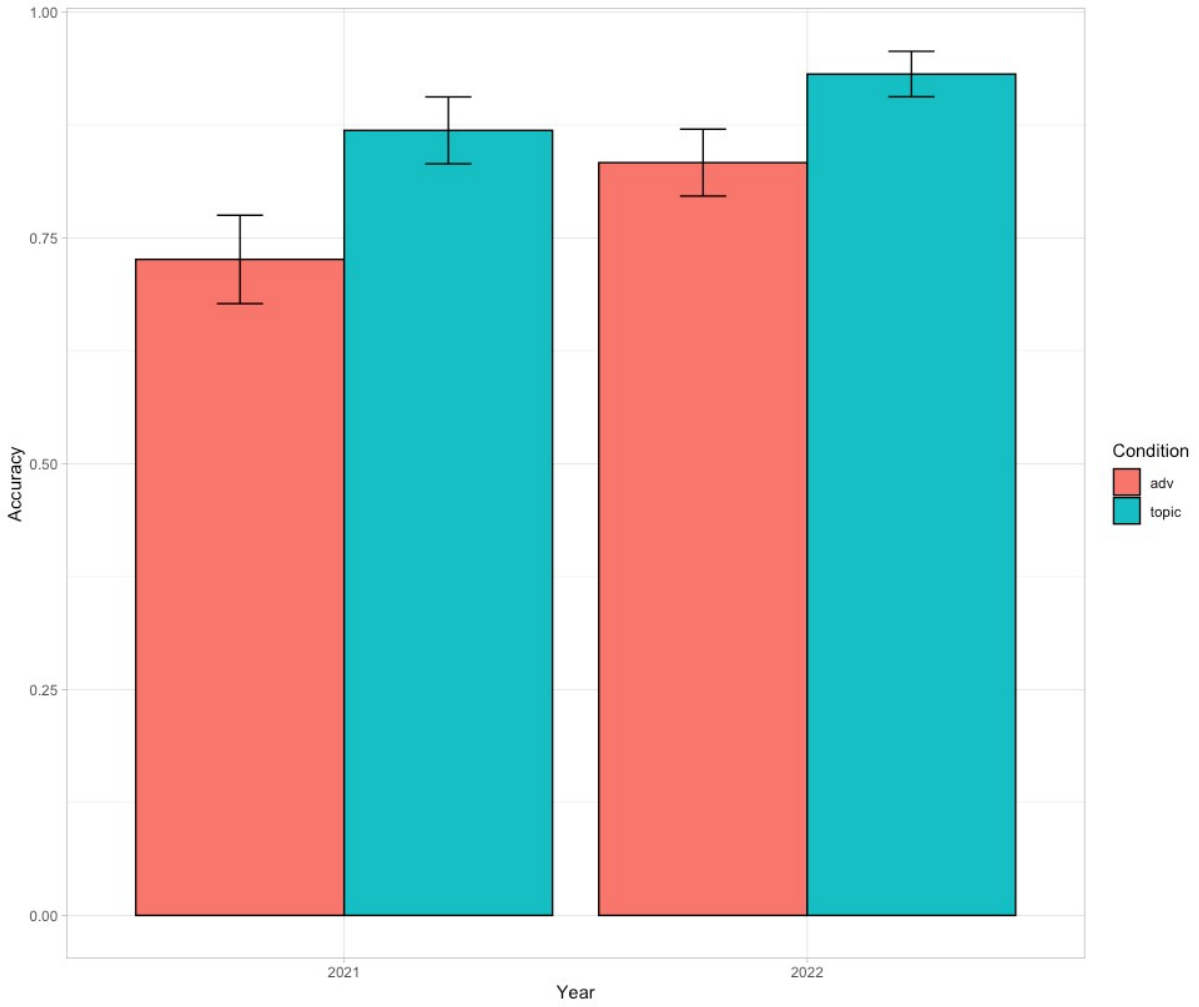

Figure 6: AJT in English results by accuracy and per condition at test time one and two

The graph illustrates the results for the English AJT at test time one (year 2021) and test time two (year 2022) by condition and percent accuracy. In the graph the target condition adverb placement is labelled as "adv" and the target condition non-subject initial declarative as "topic". At both test time one and two, participants judge the two conditions with an accuracy rate of at least 70% target-like. The graph also shows that the participants judge sentences containing the non-subject initial declarative more target-like than those containing the adverb placement condition.

6.4 Vocabulary proficiency measure

The final graph illustrates the results for the vocabulary proficiency measure (PPVT-4) and shows a comparison by test time. We calculated the PPVT score (max trial number) for each participant and then calculated and plotted the mean PPVT score for each year.

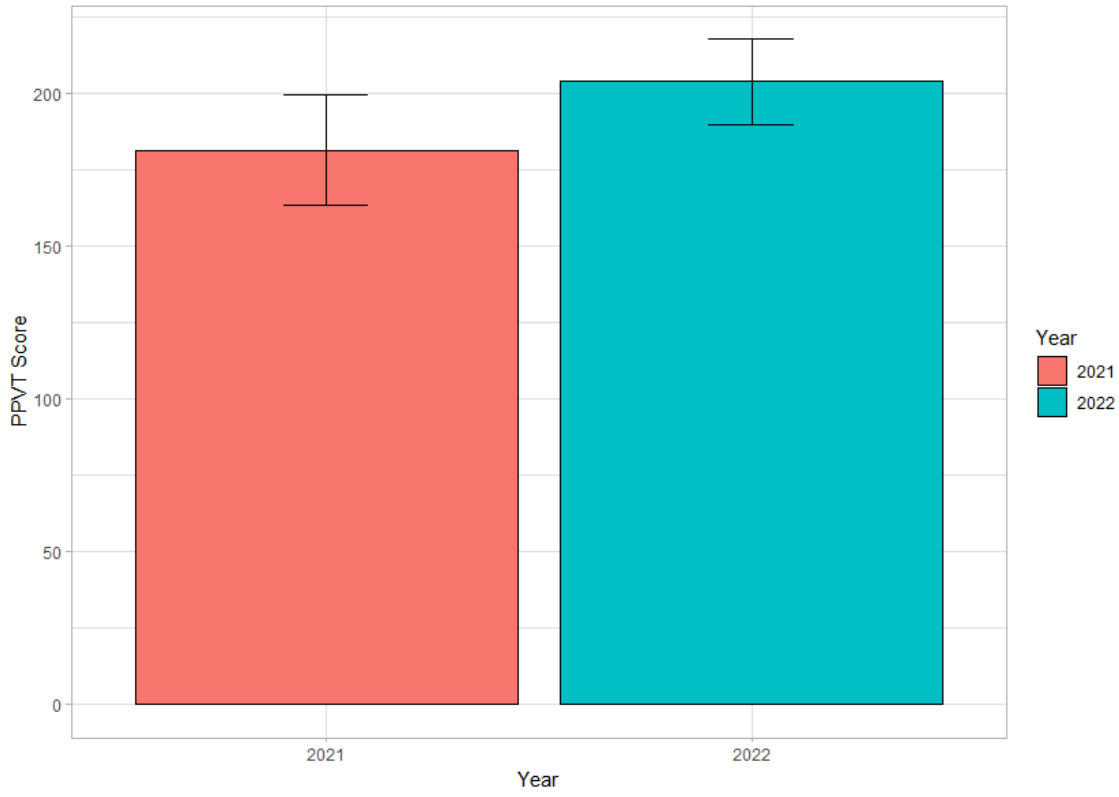

Figure 7: Vocabulary proficiency by test time

The data obtained through the PPVT is meant to gauge the participant's overall proficiency of L3 German. The comparison shows improved vocabulary proficiency from test time one (2021) to test time two (2022).

7 Discussion

In this chapter, I discuss the results with a focus on the research questions posed in chapter 4. For convenience I repeat the research questions and predictions here and discuss them in turn.

RQ1: Is there evidence of property-by-property transfer of both available languages, L1 and L2, or rather of (wholesale) transfer of either L1 or L2 in the acquisition of V2 in adverb placement and non-subject initial declaratives in the early stages of L3 acquisition?

RQ2: Is there an overall effect of sentence type (habitual adverbs and non-subject initial declaratives) on accuracy in judgement of verb placement in L3 German development when comparing test time one to test time two?

RQ3: Which factors determine the source of cross-linguistic influence in the acquisition of morphosyntactic structures in L3?

Predictions

H1: Based on previous findings (Dahl et al. 2022) on the same language combinations, I expected to find no evidence of wholesale transfer of one previously acquired language, but support for the notion that grammars of both previously acquired languages are co-activated in the acquisition process of L3 morphosyntactic properties.

H2: I predicted based on the findings of the studies mentioned above (Dahl et al. 2022), to find an overall effect of sentence type on accuracy in judgement of verb placement in L3 German when comparing test time one to test time two. I expected to find divergent acceptability rates for the two structures and support for property-by- property cross-linguistic influence.

H3: Based on previous findings (Busterud et al. 2023) on the same morphosyntactic structures, I expected to find evidence of economy being a significant factor for cross-linguistic influence in the acquisition of morphosyntactic structures in L3.

My results do not show evidence for wholesale transfer from either L1 Norwegian or L2 English at early stages of L3 German in the acquisition of V2 in adverb placement and non-subject initial declaratives. At test time one, participants do not favor one word order over the other. In our AJT, participants do not consistently accept one word order and reject the other. We can hypothesize that if there had been wholesale transfer from L1, target-like judgements right from the beginning would have been expected. Similarly, if there had been wholesale transfer from L2, a consistent preference for the V3 word order from the beginning would have been expected as the verb remains in the third constituent position in English. The results of the AJT in German at test time one show that the participants' overall performance when judging the target structures is around chance level. These results suggest that the representation for the two target structures in the learners L3 is still rather unstable. This could be because both L1 and L2 are co-activated in the L3 acquisition process, and the parser has not been exposed to sufficient input to affirm the underlying representation pertaining to the L3. Table 6 gives an overview of the L3 acquisition theories presented in Chapter 3 and how the results of the German AJT at test time one of the current study relate to each model.

Table 6: Summary of L3 morphosyntactic acquisition models' predictions in relation to AJT German results at test time one

Model	**Facilitation from L1 NOR**	**Non-facilitation from L2 ENG**	**Evidence from the present study**
LPM	**+**	**+**	**?**
SM	**+**	**+**	**?**
CEM	**+**	**-**	⊖
L1SF	**+**	**-**	⊖
L2SF	**-**	**+**	⊖
Dominant Language	**+**	**-**	⊖
TPM	**+**	**-**	⊖

Table 6 presents the various L3 morphosyntactic acquisition models' predictions for cross-linguistic influence with respect to the languages involved in the study and results of the AJT German at test time one. The plus symbol indicates that the model predicts cross-linguistic influence from this language. The minus symbol signifies that the model does not predict cross-linguistic influence from this language. The first three models in the table the Linguistic Proximity Model (LPM), the Scalpel Model (SM) and the Cumulative Enhancement Model (CEM) share the notion that when acquiring a language beyond a second language, the parser maintains access to all previously linguistic knowledge while constructing a new grammar. The LPM and the SM predict that both the L1 and the L2 are activated in the L3 acquisition process and have the potential to influence the L3 grammar. Both previously acquired languages can influence the acquisition of morphosyntactic structures of the L3, but since acquisition according to these models happens property-by-property not every structure will necessarily be influenced by the same previously acquired language. In Table 6 these models are therefore marked with a plus symbol under both L1 and L2. This is to illustrate the co-activation of both previously acquired languages in the L3 acquisition process and the potential for cross-linguistic influence of both L1 and L2. The results of the AJT in German at test time one speak for cross-linguistic influence from both previously acquired languages, but by themselves they cannot provide proof. Baseline comparison groups are necessary to assess the individual effects of the previously acquired languages. The subtractive language group design (Westergaard, 2022) would be an appropriate method to employ. For this study, this would mean giving the same AJT in German to two further L2 groups: Group 1, L1 Norwegian, L2 German and group 2, L1 English, L2 German. As the structures under investigation are a match between Norwegian and German and not between English and German, the expectation is to observe facilitation for group one and non-facilitation for group two. Should the L3 group of the current study be experiencing cross-linguistic influence from both previously acquired languages, their judgement accuracy will fall in-between the two control groups. The results of the current study may suggest that the L3 learners are experiencing cross-linguistic influence from both their L1 and their L2, but this data alone cannot be taken as strong evidence in favor of the LPM/SM. Therefore, the last column in Table 6 for the LPM and SM is marked with a question mark (i.e., tentative).

The third row relates to the Cumulative Enhancement Model (CEM). The CEM agrees with the LPM and the SM that cross-linguistic influence may come from either or both L1 or L2.

But in contrast to the LPM and the SM, the CEM hypothesizes that cross-linguistic influence will only lead to facilitation in the L3 acquisition process. In this study the properties under investigation are a match between L1 Norwegian and the target language, facilitation can only stem from L1 cross-linguistic influence. Therefore, in table 6 the CEM has a plus in the row corresponding to L1 and minus in the row for L2. As the data shows also non-target like judgement, the CEM's claim that cross-linguistic influence will only lead to facilitation is not supported. So, the column labeled "evidence from the present study" is marked with ⊖ meaning that there is no evidence to support the CEM in the results from the German AJT at test time one.

The next two models in Table 6, the L1 Status Factor (L1SF) and the L2 Status Factor both propose that order of acquisition determines which of the previously acquired languages will exert predominant cross-linguistic influence in L3 acquisition. As is clearly stated in their names, the L1SF assigns a privileged role to the L1 and the L2SF to the L2. The results of the AJT in German at test time one do not provide clear evidence for either of these models. If there was predominant cross-linguistic influence from the L1 a strong tendency towards target-like judgement of the structures would be expected. Conversely, if predominant cross-linguistic influence from the L2 was present, a strong inclination towards non-target-like judgement would be expected. The participants of this study nonetheless judged the structures at chance level.

The last two models in Table 6 hypothesize that cross-linguistic influence is not determined by order of acquisition, but rather by the language that is used most (dominant language) or by typological similarity (TPM). This means that either L1 or L2 may be selected for transfer. In the current study, the dominant language of the participants is L1 Norwegian. L1 Norwegian is also the typologically more similar language to L3 German. So, both models predict dominant cross-linguistic influence from L1 Norwegian in this study's language combination which then would have led to across-the-board target-like judgements. The results of the AJT in German at test time one do not show clear evidence to support these models, as the participants judged the structures at chance level.

The data at test time one shows mixed results and no clear preference for either accepting or rejecting the grammatical and ungrammatical items. The data shows no evidence of wholesale

transfer from either L1 or L2. Rather, it strengthens the hypothesis that both previously acquired languages are co-activated during the process of acquiring morphosyntactic properties in L3 and are sources of cross-linguistic influence in L3 processing and acquisition.

Research question two asks whether there is an overall effect of sentence type on accuracy in judgement of verb placement in L3 German. The results of the AJT in German at test time one show no significant difference in how the participants judge the two conditions. However, when comparing the results from test time one to test time two there is an overall effect of sentence type on accuracy in judgement of verb placement in L3 German. A comparison by test time and condition shows a significant difference in judgement of the two sentence types. Participants performed significantly more accurately when judging sentences of the type adverb placement at test time two as compared to test time one. There was no significant progress for the condition non-subject initial declaratives between test time 1 and 2. This conclusion is strengthened by the comparison of conditions in test time two, which showed a significant effect of sentence type on accuracy in judgement of verb placement in L3 German. Participants judged adverb placement sentence types significantly more accurately than non-subject initial sentence types at test time two. These results suggest that development towards target-like word order with adverb placement sentences happens faster than with non-subject initial declarative structures. The divergent development towards target like performance regarding the two structures may indicate property-by-property CLI/transfer (Westergaard et al., 2017; Slabakova, 2017), with properties developing at different speed depending on such factors as complexity, frequency, markedness etc. This finding is also in-line with several of the studies presented in chapter 3. Thus, Dahl et al. (2022) and Listhaug et al. (2022) reported results that showed divergent trajectories towards target-like judgement in the L3 acquisition process of verb placement by sentence type. In the study by Dahl et al. (2022) L3 German participants in year four and five judged sentences of the type sentence medial adverbs in a more target-like manner than sentences of the type non-subject initial declaratives. The study by Listhaug et al. (2022) also reported divergent trajectories for the acquisition of verb placement in L3 in two different sentence types. The results of this study showed that L1 Norwegian, L2 English speakers acquiring L3 French progressed to target-like judgements earlier for the condition sentence medial adverbs than non-subject initial declaratives. While the study by Stadt et al. (2016) did not find a significant difference in judgement of these two sentence types (Non-subject initial declaratives and Sentence medial adverbs) in their L3

French learners which were not part of the L2 English immersion program, they did find a significant difference in judgement of the two sentence types in the participant group which learned L2 English through an immersion program. These participants judged the sentences with medial adverbs significantly more accurately than non-subject initial declaratives. These observed divergent trajectories in development of two properties pertaining to verb placement in L3 suggest in my view that the acquisition of morphosyntactic structures is in fact a property-by-property process, influenced by a variety of additional factors connected to individual properties/constructions, rather than happening in a simplistic wholesale transfer manner.

The divergent development towards target-like performance specifically regarding the two target structures under investigation of the present study as well as those of the previously named studies supports the idea that underlying syntactic structures of properties and economy are a factor for cross-linguistic influence. The current study and the study by Dahl et al. (2022) both found that development towards target-like judgement happened earlier for the structure adverb placement than for non-subject-initial declaratives. Note that the underlying structures for both, the habitual adverbs and non-subject initial declaratives in German require the finite verb to move from V to I to C. At the same time, the correct surface word order for adverb placement can be achieved by shorter movement of the finite verb from V to I. This is arguably a less costly operation for the parser to perform than the long movement of the finite verb from V to I to C required for the correct surface order to emerge in German non-subject initial declaratives. The studies by Listhaug et al. (2021) and Stadt et al. (2016) investigated the acquisition of the same structures by learners of L3 French and English L2. While the L1 of the participants in these studies were different (L1 Norwegian and L1 Dutch respectively) the underlying representations of the target structures are a match between these two L1s. Both Dutch and Norwegian are V2 languages and so the finite verb is said to undergo movement from V to I to C. In their target L3 French the underlying representation for the structures under investigation is said to undergo short movement from V to I. Sentences with sentence medial adverbs in French therefore have a V2 word order while non-subject initial declaratives a V3 word order. The less costly operation here and a match between L2 English and L3 French is therefore the condition non-subject initial declaratives. Both studies found that target-like judgement of structure non-subject initial declaratives happened earlier than for sentence medial adverbs. The divergent trajectories of the two structures speaks against

the notion of wholesale transfer and is also incompatible with a hypothesis of an across-the-board parameter setting for the V2 structure.

The participants in the present study and the studies mentioned above have experience with both a language with no movement of lexical verbs (English) and a language with long verb movement to C (Norwegian/Dutch), and as far as transfer is concerned, have two options. In the study "Verb placement in L3 French and L3 German: The role of language-internal factors in determining cross-linguistic influence from prior languages." (also discussed in chapter 3) Busterud et al. (2023) propose that this could suggest that the specific realizations of verb placement in the L1, the L2, and the L3 influence transfer patterns. The authors propose that considerations of economy may lead to a tendency toward a preference for the syntactically less costly option regarding verb movement: No verb movement is preferred over short movement, and short movement is preferred over long movement. Overall, it is suggested that economy can be an additional factor for cross-linguistic influence. The results of our study are compatible with this hypothesis.

This brings me to my third research question of this study which asks which factors can lead to cross-linguistic influence. The studies discussed in chapter three argue for a variety of factors predicting cross-linguistic influence. Such factors as order of acquisition, dominant language, typological similarity between languages, typological similarity of properties and economy have been proposed to determine the source of cross-linguistic influence in L3 acquisition. The Table below provides a summary of the various models and their predictions on factors which determine cross-linguistic influence as well as if these factors are observed in the results of the current study.

Table 7: Possible factors of cross-linguistic influence

Study	Source of CLI	Factor	Evidence in present study
Hermas (2010)	Privileged role of L1	Order of acquisition	no
Bardel and Falk (2007)	Privileged role of L2	Order of acquisition	no
Flynn, Foley, Vinnitskaya (2004)	Both L1 or L2	Facilitation	no
Fallah & Jabbari (2018)	Either L1 or L2	Dominant language	no
Rothman (2011, 2015)	Either L1 or L2	Typological similarity of languages	no
Westergaard et al. (2017)	Both L1 and L2	Structural similarity of properties	no
Slabakova (2017)	Both L1 and L2	Experiential- and linguistic input, structural similarity and language usage	possibly
Westergaard et al. (2023)	Both L1 and L2	Co-activation	yes
Busterud et al. (2023)	Both L1 and L2	Economy	yes

In the present study, the two target conditions are a match between L1 Norwegian and L2 German and a mismatch between L2 English. As the results of the AJT in German at test time one did not show a clear preference for target-like or non-target like judgements there is no evidence for a privileged role of either L1 or L2 and therefore these results alone do not provide an opportunity to determine a factor for cross-linguistic influence. At test time two however, the participants judge the structure (adverb placement) significantly more accurately

than the structure non-subject initial declaratives even though both structures are a match between the L1 and the L3. This suggests that other factors besides order of acquisition, language usage and typological similarity play a role for cross-linguistic influence. Slabakova (2017) suggests experiential- and linguistic input as factors of cross-linguistic influence. It is possible to hypothesize that the language learners who participated in this study had received more positive input confirming the adverb placement structure than the non-subject initial declarative structure and therefore judged the sentences of this condition more accurately at test time two. However, as I was this groups language teacher, I know that there was not an overall stronger focus on adverb placement over non-subject initial declaratives. On the contrary, I tend to give extra attention to non-subject initial declaratives as I have observed that this structure is particularly difficult for my students to acquire. This brings me back to economy as a factor for cross-linguistic influence. While both structures under investigation are generally accounted for by long movement of the finite verb from V to I to C, sentences with medial adverbs can produce the correct surface word order in German with short movement. Assuming that the syntactic operation of long movement is more costly than short movement, sentences with medial adverbs are arguably a less costly operation than non-subject initial declaratives in German. In-line with Busterud et al. (2023) these results could point towards economy as a significant factor for cross-linguistic influence in the L3 acquisition process of verb placement in L3 German.

8 Conclusion

This empirical study aimed to investigate how cross-linguistic influence in third language acquisition proceeds. The acquisition of morphosyntactic properties, specifically in verb placement, laid out in chapter 2, is the focus of this study. The first key finding of this study was that at early stages of L3 acquisition there was no indication of wholesale transfer or a privileged role of cross-linguistic influence of the L1 or the L2. Rather, the data from this study suggests that both previously acquired languages are co-activated during the acquisition process of verb placement in L3 German. The second main finding was that there was a divergent trajectory towards target-like judgements in the L3 for the two sentence types.

Following a symmetric account for verb placement both structures under investigation undergo long movement in the target language L3 German and L1 Norwegian. An asymmetric account suggests however that one of the sentence types requires only short movement in these languages. Participants in this study judged sentences with possible short movement significantly more accurate than sentences that require long movement for the correct surface word order to emerge. This finding could indicate that economy plays a role in the acquisition of verb placement in L3 German. Furthermore, the divergent trajectory towards target-like judgement between the two structures under investigation speaks for the hypothesis that the acquisition of morphosyntactic structures in L3 is a property-by-property process and other factors besides order of acquisition and typological similarity play a role in cross-linguistic influence.

This study used a single group methodology. This design can point to important insights but cannot prove co- activation of both previously acquired languages for cross-linguistic influence in the L3 acquisition process. Baseline comparison groups as in the design of a subtractive language group would be an appropriate manner to further this study to potentially confirm what the results of this study suggest, namely that at an early stage when the language pairings are similar in typology both previously acquired languages are activated and have cross-linguistic influence on the L3. If the L3 group's accuracy in judgement of the structures than falls in between the group which has facilitation from their L1 (here: L1 Norwegian, L2 German) and the group that has non-facilitation (here: L1 English, L2 German) evidence for cross-linguistic influence of both languages can be affirmed.

Another follow-up study might be to conduct a similar study with a condition that is less marked in Norwegian than in English. If results of such a study showed stronger cross-linguistic influence from Norwegian, it would strengthen the argument that economy is a factor for cross-linguistic influence.

Conducting further studies with different methodologies is another possible future direction. This study used an offline measure (AJT). A future study could employ an online measure, e.g. eye-tracking, self-paced reading task or EEG to measure production vs. comprehension.

This L3 morphosyntactic study contributes to the core questions of generative adult L3 acquisition and adds to the current discussion on how previously acquired languages (L1 and

L2) influence the acquisition/development of morphosyntactic properties in the L3 grammar (e.g., Rothman 2015, Westergaard et al. 2017, Westergaard 2019). The findings can also be used to improve L3 German instruction in a context where learners may experience facilitation from one of the previously acquired languages and non-facilitation from the other. In a classroom setting, there is never enough time to teach and practice everything. It is beneficial for a teacher (and the student) to know which structures might be especially difficult to acquire. The results of this study indicate that explicit focus on teaching V2 in non-subject initial declaratives is for example more important than V2 in sentences with medial adverbs. Teachers can also make use of the previously acquired languages by identifying structural similarities and differences between the languages and pointing out that there can be cross-linguistic influence from both languages. This is also relevant for students who speak additional L1s.

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Appendix I

Table 8: Acceptability judgment task—overview of test items in German

Item	**Sentences**	**Gramm**	**Condition**	**Structure**
Training A	Mein Lehrer sprechen Deutsch.	U		
Training B	Sprichst Du Deutsch?	G		
1	Nina liest meistens Bücher.	G	adv	V-Adv
6	Lisa malt selten Bilder.	G	adv	V-Adv
13	Michael trifft oft Freunde.	G	adv	V-Adv
25	Alex erzählt oft Geschichten.	G	adv	V-Adv
34	Peter spielt selten Spiele.	G	adv	V-Adv
36	Lara kocht meistens Nudeln.	G	adv	V-Adv
30	Susanne meistens liest Bücher.	U	adv	Adv-V
17	Emma selten malt Bilder.	U	adv	Adv-V
45	Daniel oft trifft Freunde.	U	adv	Adv-V
54	Ben oft erzählt Geschichten.	U	adv	Adv-V
41	Paul selten spielt Spiele.	U	adv	Adv-V
2	Sarah meistens kocht Nudeln.	U	adv	Adv-V

14	Montags geht Anna ins Restaurant.	G	topic	XP-V-Subj
22	Am Samstag tanzt Laura im Garten.	G	topic	XP-V-Subj
28	Morgen lernt Klaus in der Bibliothek.	G	topic	XP-V-Subj
53	Nächsten Freitag spielt Max im Park.	G	topic	XP-V-Subj
57	Heute ist Markus in der Stadt.	G	topic	XP-V-Subj
60	Am Sonntag ist Tina in Frankfurt.	G	topic	XP-V-Subj
47	Montags Carla geht ins Restaurant.	U	topic	XP-Subj-V
33	Am Samstag Hanna tanzt im Garten.	U	topic	XP-Subj-V
50	Morgen Tom lernt in der Bibliothek.	U	topic	XP-Subj-V
37	Nächsten Freitag Leo spielt im Park.	U	topic	XP-Subj-V
4	Heute Hans ist in der Stadt.	U	topic	XP-Subj-V
24	Am Sonntag Lotte ist in Hamburg.	U	topic	XP-Subj-V

5	Meine Mutter ist jung.	G	possessive	Poss-N
15	Mein Stuhl ist braun.	G	possessive	Poss-N
27	Meine Tochter ist schnell.	G	possessive	Poss-N
42	Dein Hund ist schwarz.	G	possessive	Poss-N
55	Deine Flasche ist grün.	G	possessive	Poss-N
59	Dein Sohn ist stark.	G	possessive	Poss-N
35	Mutter meine ist jung.	U	possessive	N-Poss
49	Stuhl mein ist braun.	U	possessive	N-Poss
11	Tochter meine ist schnell.	U	possessive	N-Poss
51	Hund dein ist schwarz.	U	possessive	N-Poss
3	Flasche deine ist grün.	U	possessive	N-Poss
23	Sohn dein ist stark.	U	possessive	N-Poss
8	Dennis kann das Spiel spielen.	G	object	Obj-V
16	Julia kann die Maus sehen.	G	object	Obj-V
21	Lena kann das Haus kaufen.	G	object	Obj-V
38	Emil kann die Katze finden.	G	object	Obj-V
43	Sophie kann das Bild malen.	G	object	Obj-V
56	Lars kann das Buch lesen.	G	object	Obj-V
52	Noah kann spielen das Spiel.	U	object	V-Obj
48	Leonie kann sehen die Maus.	U	object	V-Obj

58	Anna kann kaufen das Haus.	U	object	V-Obj
10	Nick kann finden die Katze.	U	object	V-Obj
29	Marie kann malen das Bild.	U	object	V-Obj
19	Liam kann lesen das Buch.	U	object	V-Obj
9	Er hat ein Haus.	G	generic	indef
18	Du hast ein Boot.	G	generic	indef
32	Nina hat ein Kind.	G	generic	bare pl
39	Sie hat einen Pass.	G	generic	indef
44	Lukas hat einen Job.	G	generic	indef
46	Ich habe ein Auto.	G	generic	indef
31	Er hat Haus.	U	generic	bare sg
40	Du hast Boot.	U	generic	bare sg
20	Katrin hat Kind.	U	generic	bare sg
26	Sie hat Pass.	U	generic	bare sg
12	Anton hat Job.	U	generic	bare sg
7	Ich habe Auto.	U	generic	bare sg

Table 9: Acceptability judgment task—overview of test items in English

Item	Sentence	Gramm	Condition	Structure
1	Nina usually reads books.	G	adv	Adv-V
2	Lisa seldom draws pictures.	G	adv	Adv-V
3	Michael often meets friends.	G	adv	Adv-V
4	Susan reads usually books.	U	adv	V-Adv
5	Emma seldom draws pictures.	G	adv	V-Adv
6	Daniel often meets friends.	G	adv	V-Adv
7	On Mondays Anna goes to the restaurant.	G	topic	XP-Subj-V
8	On Saturdays Laura dances in the garden.	G	topic	XP-Subj-V
9	Tomorrow Sam will study in the library.	G	topic	XP-Subj-V
10	On Mondays goes Carla to the restaurant.	U	topic	XP-V-Subj
11	On Saturdays dances Hanna in the garden.	U	topic	XP-V-Subj
12	Tomorrow will study Sam in the library.	U	topic	XP-V-Subj
13	My mother is young.	G	possessive	Poss-N
14	My chair is brown.	G	possessive	Poss-N

15	My daughter is fast.	G	possessive	Poss-N
16	Mother my is young.	U	possessive	N-Poss
17	Chair my is brown.	U	possessive	N-Poss
18	Daugther my is fast.	U	possessive	N-Poss
19	Denis can play the game.	G	object	V-Obj
20	Julia can see the mouse.	G	object	V-Obj
21	Linda can buy the house.	G	object	V-Obj
22	Noah can the game play.	U	object	Obj-V
23	Lenny can the mouse see.	U	object	Obj-V
24	Anna can the house buy.	U	object	Obj-V
25	He has a house.	G	generic	indef
26	You have a boat.	G	generic	indef
27	Nina has a child.	G	generic	indef
28	He has house.	U	generic	bare sg
29	You have boat.	U	generic	bare sg
30	You have child.	U	generic	bare sg

Appendix 2

Table 10: Statistical analysis of complete AJT in German

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) [glmerMod]

Family: binomial (logit)

Formula: Accuracy ~ 1 + Condition * Year + (1 | Participant) + (1 | Item)

Data: AJT_Ge

Control: glmerControl(optimizer = "bobyqa")

AIC	BIC	logLik	deviance	df.resid
2262.1	2328.4	-1119.0	2238.1	1848

Scaled residuals:

Min	1Q	Median	3Q	Max
-4.9747	-0.9451	0.4628	0.7257	1.6528

Random effects:

Groups	Name	Variance	Std.Dev.
Item	(Intercept)	0.193	0.4394
Participant	(Intercept)	0.249	0.4990

Number of obs: 1860, groups: Item, 60; Participant, 31

Fixed effects:

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	0.10097	0.24349	0.415	0.67837	
Conditiongeneric	0.82397	0.29696	2.775	0.00553	**
Conditionobject	-0.20361	0.28826	-0.706	0.47999	
Conditionpossessive	0.70269	0.29471	2.384	0.01711	*
Conditiontopic	-0.07575	0.28873	-0.262	0.79305	
Year2022	0.82426	0.28884	2.854	0.00432	**
Conditiongeneric:Year2022	-0.30885	0.33403	-0.925	0.35516	
Conditionobject:Year2022	-0.17636	0.31432	-0.561	0.57474	
Conditionposs:Year2022	0.39200	0.34997	1.120	0.26268	
Conditiontopic:Year2022	-0.65961	0.31385	-2.102	0.03558	*

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

	(Intr)	Cndtng	Cndtnb	Cndtnp	Cndtnt	Yr2022	Cndtng:Y2022
Conditngnrc	-0.574						
Conditnbjct	-0.591	0.484					
Cndtnpssssv	-0.578	0.476	0.488				

Conditintpc -0.590 0.484 0.499 0.488

Year2022 -0.614 0.298 0.305 0.300 0.305

Cndtng:Y2022 0.312 -0.561 -0.264 -0.258 -0.263 -0.522

Cndtnb:Y2022 0.332 -0.272 -0.562 -0.274 -0.280 -0.557 0.480

Cndtnp:Y2022 0.298 -0.244 -0.252 -0.526 -0.251 -0.497 0.432

Cndtnt:Y2022 0.332 -0.273 -0.281 -0.275 -0.565 -0.560 0.481

Cndtnb:Y2022 Cndtnp:Y2022

Conditngnrc

Conditnbjct

Cndtnpssssv

Conditintpc

Year2022

Cndtng:Y2022

Cndtnb:Y2022

Cndtnp:Y2022 0.458

Cndtnt:Y2022 0.512 0.458

> emmeans(m, pairwise ~ Condition|Year, infer = T)

Year = 2021:

Condition emmean SE df asymp.LCL asymp.UCL z.ratio p.value

adv 0.1010 0.243 Inf -0.3763 0.578 0.415 0.6784

generic 0.9249 0.254 Inf 0.4272 1.423 3.642 0.0003

object -0.1026 0.244 Inf -0.5802 0.375 -0.421 0.6736

possessive 0.8037 0.251 Inf 0.3111 1.296 3.198 0.0014

topic 0.0252 0.244 Inf -0.4535 0.504 0.103 0.9177

Year = 2022:

Condition emmean SE df asymp.LCL asymp.UCL z.ratio p.value

adv 0.9252 0.237 Inf 0.4600 1.391 3.898 0.0001

generic 1.4404 0.251 Inf 0.9487 1.932 5.742 <.0001

object 0.5453 0.232 Inf 0.0904 1.000 2.349 0.0188

possessive 2.0199 0.275 Inf 1.4812 2.559 7.349 <.0001

topic 0.1899 0.230 Inf -0.2613 0.641 0.825 0.4095

Results are given on the logit (not the response) scale.

Confidence level used: 0.95

$contrasts

Year = 2021:

contrast estimate SE df asymp.LCL asymp.UCL z.ratio p.value

adv - generic -0.8240 0.297 Inf -1.6340 -0.0139 -2.775 0.0439

adv - object 0.2036 0.288 Inf -0.5827 0.9899 0.706 0.9551

adv - possessive	-0.7027	0.295 Inf	-1.5066	0.1012	-2.384	0.1195
adv - topic	0.0757	0.289 Inf	-0.7118	0.8633	0.262	0.9990
generic - object	1.0276	0.297 Inf	0.2168	1.8383	3.457	0.0050
generic – poss	0.1213	0.303 Inf	-0.7050	0.9476	0.400	0.9946
generic - topic	0.8997	0.298 Inf	0.0879	1.7115	3.023	0.0211
object – poss	-0.9063	0.295 Inf	-1.7109	-0.1017	-3.073	0.0181
object - topic	-0.1279	0.289 Inf	-0.9159	0.6602	-0.443	0.9921
poss - topic	0.7784	0.295 Inf	-0.0272	1.5841	2.636	0.0641

Year = 2022:

contrast	estimate	SE	df	asymp.LCL	asymp.UCL	z.ratio	p.value
adv - generic	-0.5151	0.297	Inf	-1.3264	0.2962	-1.732	0.4142
adv - object	0.3800	0.283	Inf	-0.3919	1.1518	1.343	0.6643
adv - possessive	-1.0947	0.318	Inf	-1.9609	-0.2285	-3.447	0.0051
adv - topic	0.7354	0.282	Inf	-0.0339	1.5046	2.608	0.0690
generic - object	0.8951	0.294	Inf	0.0934	1.6967	3.046	0.0197
generic – poss	-0.5796	0.327	Inf	-1.4704	0.3112	-1.775	0.3884
generic - topic	1.2505	0.293	Inf	0.4508	2.0502	4.265	0.0002
object – poss	-1.4747	0.314	Inf	-2.3322	-0.6172	-4.691	<.0001

object - topic 0.3554 0.278 Inf -0.4023 1.1131 1.279 0.7040

possessive - topic 1.8300 0.314 Inf 0.9740 2.6861 5.831 <.0001

Results are given on the log odds ratio (not the response) scale.

Confidence level used: 0.95

Conf-level adjustment: tukey method for comparing a family of 5 estimates

P value adjustment: tukey method for comparing a family of 5 estimates

> emmeans(m, pairwise ~ Year|Condition)

Condition = adv:

Year emmean SE df asymp.LCL asymp.UCL

2021 0.1010 0.243 Inf -0.3763 0.578

2022 0.9252 0.237 Inf 0.4600 1.391

Condition = generic:

Year emmean SE df asymp.LCL asymp.UCL

2021 0.9249 0.254 Inf 0.4272 1.423

2022 1.4404 0.251 Inf 0.9487 1.932

Condition = object:

Year emmean SE df asymp.LCL asymp.UCL

2021 -0.1026 0.244 Inf -0.5802 0.375

2022 0.5453 0.232 Inf 0.0904 1.000

Condition = possessive:

Year	emmean	SE	df	asymp.LCL	asymp.UCL
2021	0.8037	0.251	Inf	0.3111	1.296
2022	2.0199	0.275	Inf	1.4812	2.559

Condition = topic:

Year	emmean	SE	df	asymp.LCL	asymp.UCL
2021	0.0252	0.244	Inf	-0.4535	0.504
2022	0.1899	0.230	Inf	-0.2613	0.641

Results are given on the logit (not the response) scale.

Confidence level used: 0.95

$contrasts

Condition = adv:

contrast	estimate	SE	df	z.ratio	p.value
Year2021 - Year2022	-0.824	0.289	Inf	-2.854	0.0043

Condition = generic:

contrast	estimate	SE	df	z.ratio	p.value
Year2021 - Year2022	-0.515	0.307	Inf	-1.679	0.0932

Condition = object:

contrast	estimate	SE	df	z.ratio	p.value
Year2021 - Year2022	-0.648	0.285	Inf	-2.275	0.0229

Condition = possessive:

contrast	estimate	SE	df	z.ratio	p.value
Year2021 - Year2022	-1.216	0.325	Inf	-3.745	0.0002

Condition = topic:

contrast	estimate	SE	df	z.ratio	p.value
Year2021 - Year2022	-0.165	0.284	Inf	-0.580	0.5616

Results are given on the log odds ratio (not the response) scale.