The acquisition of finiteness by Turkish learners of German and Turkish learners of French:

Investigating knowledge of forms and functions in production and comprehension

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The acquisition of finiteness by Turkish learners of German and Turkish learners of French:

Investigating knowledge of forms and functions in production and comprehension

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Contents

Introduction

Chapter 1

Interlocutors with the same native language are able to communicate quickly and effortlessly with each other in this language. The speaker can map the meaning he or she wants to convey onto a string of sounds, and the hearer is able to decode these sounds and extract meaning from them. This presupposes that both the speaker and the hearer share knowledge about how meaning is mapped onto certain forms in this specific language, and they must be able to access and use this knowledge quickly in order to encode meaning into fluent strings of sound as a speaker, and decode sound into meaning as a listener. Usually, native speakers are not aware of this knowledge, and they have only limited conscious access to its representation and the processes with which it is put to use.

For this reason, the complexity and even the sheer existence of linguistic knowledge are more obvious when one is confronted with a language one does not know. As soon as one has the occasion to listen to a conversation in such a language, one's lack of knowledge is immediately apparent. A first problem arises because one does not know where words or other meaningful units of sound might start and end in the speech stream. Let us suppose, however, that a listener would continue to be confronted to conversations in a language he or she does not know for a longer time. Probably, this listener would, after some time, be able to extract some meaningful units out of the speech stream, for example, frequent content words. These are, however, only the first form-function mappings that can be made, and many more aspects of the input would still remain mysterious for such a beginning listener. Any given element in the input could have one or more different possible functions. In particular, elements in the input might have a lexical function, thereby enabling the speaker to refer to descriptive content, or they might have grammatical functions. In that case, they may for instance indicate person, number, tense, aspect or mood, or they could specify the relations between different elements in the sentence. Even if a beginning listener knows whether a certain element has a lexical or grammatical function, he or she still needs to determine the exact meaning of the element in the given context, which can be very abstract and complex.

Additional problems may arise when this listener wants to start to express himself or herself in the second language. In order to produce an utterance, knowledge has to be actively put to use. In production, the speaker not only has to passively recognize lexical and grammatical items when presented with them, but must be able to actively retrieve and produce these items. Moreover, it is possible to understand an utterance without knowing

which of the formal properties of this utterance are obligatory, and for which ones there might be optional variations. When producing an utterance, however, a speaker is forced to choose a certain form, which thus requires more knowledge about the formal properties of the target language than is necessary for comprehension.

Based on this description, acquiring a language seems an almost impossible task. Yet, children acquiring their native language master this task within a few years. It has been suggested that this is possible with the help of an innate mechanism, which might not be available anymore to adult learners of a second language (Lenneberg, 1967). Adult learners, however, are obviously able to acquire knowledge about second languages as well, and, as will become clear below, this is also possible without any explicit instruction. How do these learners acquire the linguistic knowledge needed to produce and comprehend utterances in the second language? It seems likely that adult learners partly rely on knowledge they have about their first language to analyze the second language and to produce utterances in this language. But how is this knowledge then complemented by newly acquired knowledge about the second language, and how does it develop into target-like knowledge of form-meaning mappings?

These questions have been investigated in a large European research project (see Klein and Perdue, 1992; Klein and Perdue, 1997; Perdue, 1993), in which the linguistic development of immigrants in different European countries was studied. It was found that, unsurprisingly, the acquisition of knowledge about the target language is not a one-step process. Rather, the production of (untutored) second language learners can be described as developing in different stages, in which language-specific as well as cross-linguistically valid principles of form-meaning mappings interact in different ways, depending on how much knowledge the learner has acquired about the target language. The general properties of these stages were found to be strikingly similar in the different target languages investigated in the project. Learners uniformly first rely on a so-called nominal utterance organization (NUO), before they achieve an infinite utterance organization (IUO) and finally, in some, but not all cases, a finite utterance organization (FUO). The general properties of these three stages are summarized by Klein and Perdue (1992) as follows:

> In NUO, utterances are extremely simple and mainly consist of seemingly unconnected nouns, adverbs and particles (sometimes also adjectives and participles). What is largely missing in NUO, is the structuring power of verbs - such as argument structure, case role assignment, etc. [...]. This is different in the IUO: The presence of verbs allows the learners to make use of the different types of valency which come with the (non-finite) verb [...]. At this level, no distinction is made between the finite and non-finite component of the verb; such a distinction, which is of fundamental importance in all languages involved in this

> study, is only made at the level of FUO, which is not attained by all our learners. Transition from NUO to IUO and from there to FUO is slow and gradual, and the coexistence of several types of utterance organisation as well as backsliding is not uncommon. (Klein and Perdue, 1992: 302)

What distinguishes the different stages according to this description is knowledge that learners have in the domain of verbs. In NUO, learners mainly rely on utterances that do not contain verbs at all. Subsequently, in IUO, learners use verbs, but these verbs lack an important property: finiteness. This means that learners make no use of the distinction between finite verb forms (verb forms marked for agreement, tense, aspect and mood) and non-finite verb forms (infinitival and participle forms), and they are not aware of the meaning differences that are associated with this distinction and the different types of finite forms. The finiteness distinction is only acquired in FUO, which is not attained by all learners.

The aim of this thesis is to investigate in more detail the acquisition of finiteness, thus, the transition from IUO to FUO, in two target languages, German and French. In doing so, some of the general questions about language acquisition that were raised above can be investigated for this specific domain and in these specific languages. What is the knowledge that learners have about the formal properties of finite utterances? What is the meaning they associate with finiteness? How does this knowledge develop, and how do learners put it to use in production and comprehension? In the following, the two relevant stages of acquisition as described by Klein and Perdue (1992) are briefly presented. How the acquisition of finiteness is analyzed in functional approaches as the one advocated by Klein and Perdue (1992) is then summarized, and alternative formal perspectives on finiteness are introduced. The introduction ends with an overview of the more specific research questions investigated in this thesis, the methods used to investigate these questions, and an overview of the key findings.

From a non-finite to a finite utterance organization

Throughout this thesis, the analysis of learners' production relies on retellings of a silent movie (The finite story, Dimroth, 2005) that have been obtained from all learners participating in the study. This movie starts with three different inhabitants of a house going to bed one after the other. Subsequently, a fire breaks out in the house. Two of the inhabitants continue to sleep, but the third one wakes up, sees the fire, and calls the fire brigade. However, the fireman who is in charge does not answer the phone because he is in the bathroom when the phone rings. In the following, two retellings of the film up to that point are given, one provided by a Turkish learner of German whose utterances are mainly

structured according to IUO, and one provided by one of the most advanced Turkish learners of German in the sample who clearly has entered FUO.

Retelling in IUO:

herr blau schläft	Mr. blue sleeps
herr grün auch schläft	Mr. green also sleeps
herr rot auch schläft	Mr. red also sleeps
da is feuer dach	there is fire roof
herr grün weiterschlafen	Mr. green continue sleep
herr rot auch weiterschlafen	Mr. red also continue sleep
herr blau guckt	Mr. blue watches
nicht schläft	not sleeps
er anrufen	he call
feuerwehr gehen toilette	fire-brigade go toilet
nicht gucken das telefon	not look the telephone
er später kommt	he later comes
nicht sprechen aber in telefon	not speak but in telephone

Retelling in FUO:

der blaue mann ist seine bett gegange	the blue man is his bed gone
der grüne mann auch ist ins bett gegangen	the green man also is in the bed gone
der rote mann er hat einfach geschlafen	the red man, he has simply slept
gibt's eine feuer auf dem dach	there is a fire on the roof
die grüne mann schläft	the green man sleeps
herr rote mann auch schläft	Mr. red man also sleeps
herr blaue mann hat feuer gesehen	Mr. blue man has fire seen
er wollte sofort feuerwehr anrufen	he wanted immediately fire brigade call
er ruft jetzt feuerwehr an	he calls now fire brigade
feuerwehr klingt das telefon	fire brigade rings the phone
er wollte auslegen... er wollte das telefon auslegen	he wanted to answer... he wanted the phone to answer
aber telefon hat schon aufgehört.	but phone has already stopped

These two retellings are very different in the domain of verb morphology, the types of verbs used, and the syntactic position that the verb takes in the utterance. In the first retelling, finite and non-finite verb forms occur in the same syntactic contexts, and there seems to be no functional motivation for the choice of a finite rather than a non-finite verb form. Except for one use of the light verb 'is', this learner mainly relies on lexical main

verbs. Moreover, she has not acquired the grammatical rule (which is presented in more detail in chapter 2), according to which finite verbs have to appear in second position in German. In particular, finite verbs follow the particle *auch* ('also'), the negator and temporal adverbials (*später,* 'later') in the speech of this learner, which is ungrammatical in the target language.

In contrast, finiteness marking seems to be obligatory in the speech of the second learner. All verb forms that occur are finite forms that are correctly marked for agreement with the subject. Moreover, this learner uses different types of light verbs (auxiliary verbs and modals) that do not occur in the speech of the first learner. The placement of the finite verb is not always target-like, as it follows the particle *auch*, as is the case in the speech of the first learner. However, target-like verb placement can be observed in the second learner for sentences containing temporal adverbials, indicating that this learner is more advanced in the acquisition of the German verb-second rule than is the first learner.

To come back to the questions introduced above, one might wonder what exactly is the knowledge that the second learner has acquired, and the first one has not yet acquired. What is it that learners have to acquire for achieving a finite utterance organization? Very different answers are given to this question by proponents of different approaches to second language acquisition. A brief introduction is given in the next section to the two main perspectives that are taken on this phenomenon: finiteness from a functional perspective, and finiteness from a formal perspective. These two approaches are described in much more detail in subsequent chapters of the thesis, and the following summary is only intended as a first overview.

Functional and formal approaches to the acquisition of finiteness

The form and the position of the finite verb can encode different, very complex functions in the two target languages under investigation here. Finite verb forms carry temporal, aspectual and modal meanings, and express the relation between the subject and the verb by being marked for person and number. Moreover, the position of the finite verb contributes to marking an utterance as declarative, interrogative or imperative.

Most of these complex functions and the way in which they are expressed by the form and the position of the verb are not investigated in the present study. It concentrates on the basic function of finiteness in very simple present tense declarative main clauses, such as the ones used by the learners cited above. The difference that is of interest is the difference between utterances of the type *herr grün schlafen* on the one hand, and *herr grün schläft* on the other hand. The question relevant for this section is what it is that finiteness contributes to the second utterance that is not present in the first.

According to Klein (2006), a finite verb form introduces an assertion operator into the utterance, which has the function of linking the descriptive content of the utterance,

namely, in the example given here, "Mr. green sleeping", to a particular situation. More precisely, finiteness expresses that the descriptive content holds at the time and place to which the utterance refers. According to functional approaches to the acquisition of finiteness (Dimroth, Gretsch, Jordens, Perdue and Starren, 2003; Klein and Perdue, 1992), it is the formal expression of this basic function that learners have to acquire in order to proceed from IUO to FUO. In IUO, learners are not yet able to express assertion by finiteness. Instead, they rely on lexical means to express assertion. This is also the characterization that is given of IUO more in general: As little language-specific morpho-syntactic knowledge is available at this stage to the learner, meanings that are expressed by specific morpho-syntactic forms in FUO are expressed by using purely lexical (as opposed to grammatical) items of the target language which are arranged according to a set of cross-linguistically valid semantic and pragmatic principles. The transition from a non-finite to a finite utterance organization goes together, according to these approaches, with a general change from relying more on semantic to relying more on morpho-syntactic principles of utterance organization. The turning point to FUO consists of mapping the meaning of assertion onto the morpho-syntactic form of finiteness. This includes the necessity to gain knowledge about what are grammatically correct verb forms and verb positions in the target language, but the crucial step according to functional approaches is not the acquisition of this formal knowledge itself, but the association of the meaning of assertion with these forms. Importantly, functional approaches assume that light verbs, in particular auxiliaries, have a triggering role in the acquisition of this new form-meaning mapping.

Formal approaches to second language acquisition (Hawkins, 2000a; Meisel, 1997; Vainikka and Young-Scholten, 1996a, 1996b; White, 2003) are not concerned with the meaning expressed by finite forms. According to these approaches, the difference between the utterances *herr grün schlafen* and *herr grün schläft* that is of interest to language acquisition theories is a purely formal one. It is assumed to lie in the different morpho-syntactic structure that these utterances are supposed to have according to generative grammar. In generative terms, the non-finite utterance can be represented as being composed of a simple VP, and does not presuppose the existence of verbal functional categories higher in the phrase structure. In contrast, a finite utterance such as *herr grün schläft* is evidence for the fact that the speaker of this utterance can project not only lexical categories such as VP, but also functional categories such as IP. Different proponents of the formal view on second language acquisition have very different views on whether learners have knowledge about the underlying phrase structure of finite and non-finite utterances, to what extent this knowledge is similar to that of native speakers, and whether or not it can develop during the acquisition process. But while different proponents disagree as to the answer to these questions, they crucially agree that these are indeed the relevant questions to be asked about the acquisition of finiteness: What formal knowledge do learners have

about finiteness, and how does it develop? The view that these approaches have on language acquisition is thus very different from the functional perspective presented above, in particular as far as early stages of development are concerned. Whereas functional approaches attribute a lot of weight to semantic and pragmatic principles of utterance organization in particular at early stages, formal approaches describe even early learner utterances in formal terms only. The views are more compatible with each other in the description of subsequent stages of acquisition after finiteness has come into play.

The current study: aims, methods, research questions, and an overview of the results

The current study aims at taking both the formal and the functional view of the acquisition of finiteness into account. More specifically, it attempts to find evidence for different possible descriptions of learners' knowledge both about the forms and the functions of finiteness. The proficiency stage of interest thereby covers the transition phase from IUO to FUO. This transition is investigated in a cross-sectional design, by testing around 50 Turkish learners of German and around 50 Turkish learners of French, who each are somewhere on a continuum between a dominantly non-finite and a dominantly finite utterance organization. There are no learners in the sample who have not yet started to use verbs at all, nor any who have achieved native-like use of finiteness in simple declarative present tense utterances.

In order to investigate the knowledge that learners have about the forms and functions of finiteness, the present study combines very different methods. Whereas the European project described above relied exclusively on describing learners' production, it is believed here that relying on one type of data only might give a biased picture of learners' linguistic knowledge. In particular, as has already been alluded to above, learners might have more knowledge about the target language than they are able to actively use in production. On the other hand, they might also sometimes copy certain properties of the input into their production, without possessing the syntactic knowledge that can be supposed to underlie the use of these forms in native speakers, or without possessing a native-like understanding of the function of these forms. To attenuate this problem, the present study uses different types of tasks, in particular, tasks that assess linguistic knowledge not only in learners' production, but also in learners' comprehension. As will become clear in the following chapters, different tasks give a different picture of learners' knowledge, even if the same learners and the same types of sentences are tested. While this can sometimes make it difficult to arrive at straightforward conclusions, it allows for conclusions about what might be the influence of specific tasks on learners' performance, and can thus ultimately help to provide a more balanced picture of learners' knowledge, and, in addition, to provide methodological knowledge that can be used in future studies.

Using these different methods, the following three broad research questions are investigated throughout the thesis:

> 1) What is the knowledge that Turkish learners of German and French have about the *formal realization* of finiteness in the respective target languages?

This question is investigated in chapters 2 and 3. These chapters are not concerned with the meaning of finiteness, but with the form of finite and non-finite sentences and the knowledge that learners have about this form. In particular, an important question is whether the form of utterances is shaped by semantic or syntactic constraints, and, in particular for syntactic constraints, in how far these resemble the knowledge native speakers have about the form of finite and non-finite utterances. To investigate these questions, chapters 2 and 3 present results from production, self-paced listening and imitation of negated sentences. Negated sentences are used because they present a particularly interesting test case, both for formal and functional approaches to the acquisition of finiteness.

From a functional point of view, negation allows us to test the relative influence of syntactic and semantic constraints in the learner grammar: Syntactically, the target-like position of the finite verb is to the left of negation. However, semantically, it is assumed to be a more transparent configuration if the verb follows the negator (Becker, 2005). This is the case because it is assumed that in most utterances, the negator has scope over the verb, and scope-relations are marked transparently only if the scope-bearing item precedes rather than follows the element which is in its scope. For second language acquisition, it is assumed that at the IUO-stage, semantic constraints should be of dominant influence in the learner grammar, and verbs should thus appear to the right of the negator. The appearance of verbs to the left of the negator can then be taken as a sign that syntactic constraints of the target language come to be integrated into the developing grammar, even if this leads to a violation of general semantic principles. From a generative, formal view, the presence of a negator in a sentence allows to determine the position of the verb in the underlying phrase structure. If the verb appears to the left of negation, it is assumed to have raised out of the VP to a higher functional category, and thereby provides evidence that this category is part of the syntactic knowledge of the learner. If, in contrast, the verb appears to the right of negation, it is assumed that it is not raised out of the VP. Moreover, if there is a correlation between morphological finiteness marking on the verb and its position, such that finite verbs appear to the left and non-finite verbs to the right of the negator, this is taken as evidence by generative approaches that not only there are functional categories in the learner grammar, but that these categories have the same properties as in native grammars (Prévost and White, 2000).

In chapter 2, results from a self-paced listening task are presented that reveal that the tested learner groups are largely influenced by semantic constraints in their processing difficulty. This can be seen in the fact that participants can process preverbal negation faster than postverbal negation on some segments of the sentences during self-paced listening. This provides evidence for a stage in which these constraints play a dominant role in the learner grammar, which is in line with functional approaches to language acquisition, but not immediately compatible with a formal view on language acquisition.

However, not all of the learners tested here are at a stage of acquisition at which the utterance structure would be exclusively dominated by semantic constraints. Rather, there is evidence in learners' production that they also have syntactic knowledge about verb raising. In chapter 3, a more form-oriented task (when compared to self-paced listening) is used to examine syntactic knowledge, namely, elicited imitation. The results of this chapter provide evidence for a structure-building view of syntactic knowledge in the tested learner groups (Dimroth et al., 2003; Vainikka and Young-Scholten, 1996a, b). It seems that some of the tested learners of German can only project a VP and have no access to higher functional categories. However, for a more advanced subgroup of the learners of German as well as for all learners of French, evidence can be found for the presence of native-like higher functional categories, although these might not be projected obligatorily in every utterance.

To sum up, there is evidence in learners of both languages that there is a stage of development at which the form that utterances take is mainly determined by semantic constraints. Presumably, learners at this stage do not have native-like knowledge about the grammatical constraints related to finiteness in the target language. The semantic constraints that govern the utterance structure at this stage of acquisition are shown to remain of influence for the group as a whole, in particular in the processing of utterances for comprehension. But most of the learners of the present study can be assumed to have developed some syntactic knowledge about finiteness, and thus are on their way out of a purely semantically based system. The learners of French are more advanced in this respect than the learners of German. The second research question is concerned with the meaning of these finite structures to learners of both target languages.

> 2) What is the knowledge that Turkish learners of German and French have about the *meaning* of finiteness in the respective target languages?

Knowledge about the meaning of finiteness is investigated by means of a picture selection task which is presented in chapters 4 and 5. As formal approaches make no claims about the meaning contribution of finiteness in a sentence, these two chapters are restricted to predictions that can be derived from functional approaches to language acquisition. In

chapter 4, results for the learners of German are presented. They show that in this target language, the understanding of the meaning of finiteness seems to go together with the acquisition of the auxiliary system: Learners who have not yet acquired auxiliaries can be shown to have no understanding of the assertion-marking function of finiteness. In contrast, learners who have acquired the use of auxiliaries have a more native-like interpretation of finiteness. This result is in line with the predictions made by functional approaches to the acquisition of finiteness, such as Dimroth et al. (2003). In addition, it provides evidence for the often made assumption, both by formal and by functional approaches, that auxiliaries play a special role for the acquisition of finiteness (Becker, 2005; Parodi, 2000; Verhagen, 2009).

Interestingly, as shown in chapter 5, no such evidence can be found for the learners of French. These learners show no sensitivity to the meaning of finiteness in the picture selection task, independently of whether they have acquired auxiliaries or not. This observation is addressed in more detail in the last research question addressed in this thesis:

> 3) Is the acquisition of knowledge about the form and function of finiteness influenced by *language specific properties* of German and French?

The summary of the research findings regarding the form and function of finiteness points to an interesting difference between the learners of German and the learners of French. The learners of French seem, as a whole, to be more successful in producing target-like finite utterances. At the same time, they seem to be less successful in understanding the function of finiteness in the target language, when compared to the learners of German.

This contrast is discussed in chapter 3 with respect to formal knowledge and in chapter 5 with respect to form-meaning associations. It is suggested that French might provide learners with a more consistent input than German, pushing for the use of finite rather than non-finite forms and for the use of raised rather than unraised positions. Learners take over these input properties and produce a higher percentage of these target-like types of utterances than the learners of German. However, it is argued in chapter 5 that it might be exactly the absence of evidence for non-finite forms and non-finite positions in the input that makes it hard for the learners of French to understand what the meaning of finiteness is. The meaning of a certain form can more easily be understood if there is a clear contrast with another form carrying an opposed meaning or fulfilling a different function. The division of labor between finite and non-finite verb forms is particularly clear in German, providing learners with a strong contrast between these two types of forms that seems to help them to understand what the meaning of finiteness is. This is less so the case in French. As a consequence, learners of French do not in general acquire the basic

assertion-marking contribution of finiteness in the period of development investigated here, although they acquire formal knowledge about finiteness relatively easily.

This answer to the last research question shows that it is useful to investigate, as it is done in this thesis, both knowledge about formal properties on the one hand, and knowledge about the functions of the concerned forms on the other. Taking both domains into account allows us to demonstrate for the domain of assertion marking what has often before been shown for other domains in functionally oriented research: Meaning cannot simply be assumed to develop at the same time as form, in the sense that if a learner produces a form that is target-like, he or she can also be assumed to have acquired the target-like meaning of this form. Whether this is the case may depend on many different factors. The findings of the present study show that one of these factors is the transparency of form-meaning mappings in the target language, which can vary dramatically even between languages that have a seemingly highly similar organization in the investigated domain.

The relative influence of syntactic and semantic factors in early second language acquisition: Evidence from self-paced listening of negated sentences

Chapter 2

Abstract

This chapter uses a self-paced listening task to investigate processing costs during the comprehension of negated utterances in beginning Turkish learners of German and French. The aim is to explore the relative influence of syntactic and semantic factors in early learner grammars. First, the different analyses of negation provided by formal and functional approaches to second language acquisition are introduced. Subsequently, the results are presented and it is shown that none of the different syntactic approaches can fully account for them. Instead, the results speak for a strong influence of semantic and frequency factors on processing cost in beginning learners' comprehension. The chapter ends with a discussion of the theoretical and methodological implications of the findings.

1. Introduction

This chapter aims to investigate the relative influence of syntactic and semantic factors on the difficulty of processing of negated utterances in the comprehension of beginning Turkish learners of German and beginning Turkish learners of French.[1]

It is well established that investigating learners' comprehension is one way of gaining knowledge about the underlying representations of the target language that are of central interest to theories of L2 acquisition (see e.g. Eubank, 1993; Juffs and Harrington, 1995, 1996). Comprehension measures only give us limited access to these representations. First, there are other factors besides linguistic knowledge that can influence processing cost. Second, there is no guarantee that learners always use all of their knowledge when attempting to understand an utterance. In particular, they might sometimes process sentences in a shallow manner, only relying on part of this knowledge (see e.g. Clahsen and Felser, 2006). Similar limitations hold for all other possible types of evidence about underlying linguistic representations, in particular, production data. Speakers may produce utterances that do not directly correspond to their linguistic knowledge for non-linguistic reasons such as working memory limitations (see e.g., Chomsky and Miller, 1963). For L2 learners, it is particularly plausible that only part of the knowledge they have about the target language is accessible and automatized enough to be used when utterances have to be produced under time and communicative pressure (see Epstein, Flynn and Martohardjono, 1996; Grondin and White, 1996; Haznedar and Schwartz, 1997; Lardiere, 1998 and Prévost and White, 2000, for similar arguments). In fact, intuitively, L2 learners often have the impression that they are able to understand more complex utterances than they are able to produce. If comprehension can indeed precede production, comprehension data can possibly provide evidence for linguistic knowledge that learners may have but which they do not yet systematically use in production (see Naiman, 1974 and Verhagen, 2009, for evidence supporting this idea). Moreover, the fact that both production and comprehension data provide only indirect evidence about linguistic knowledge makes it particularly important to consider both types of data in order to gain a picture that is as complete as possible.[2]

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[1] This topic makes it necessary to present both formal and functional accounts of the acquisition of negation as well as their theoretical motivations. As a consequence, this chapter differs from subsequent chapters of this thesis in containing a relatively long theoretical introduction, in which different theoretical perspectives on second language acquisition are introduced by presenting their respective analyses of the acquisition of negation. This provides the theoretical background also for the subsequent chapters of the thesis.

[2] An argument that could be made against using comprehension data to inform linguistic theory is that comprehension and production might rely on different knowledge sources. Whether this is the case or not is indeed an open question (see e.g., Grodzinsky, 2000; Kempen, 2000). However, if this is the case, this makes it all the more urgent for linguistic theory to investigate both production and comprehension to gain a full picture of linguistic knowledge. After all, there is no reason why comprehension-specific knowledge should be of less theoretical interest than production-specific knowledge. Moreover, still assuming different representations are involved, this does not mean that there is no relation and similarity between them. Otherwise, communication

For these reasons, the present study attempts to add to well-established facts about the production of negated utterances by beginning second language learners with data from learners' processing of negated utterances for comprehension, in order to draw conclusions about their underlying knowledge. More specifically, as theories differ in the weight they attribute to syntactic and semantic factors in learners' representations of the target language, the present study aims at comparing the influence of syntactic and semantic properties of utterances on learners' processing. Separating syntactic from semantic factors is not an easy task. First, as shown in section 1.3, it is assumed that both properties can influence language processing independently and, moreover, interact with each other. The aim is thus not to decide whether either syntax or semantics influences processing cost in beginning learners, but to estimate their relative influence. Second, the estimation of the influence of syntactic knowledge is complicated by the fact that there is no consensus in the literature about what kind of syntactic knowledge beginning learners should be assumed to have and to use in processing the L2, so that several possibilities have to be taken into account. Despite these difficulties, the present study shows that it is possible to tease apart the different influences at least for the types of utterances investigated here, and that these data can contribute to evaluating theories about L2 knowledge.

In the following, syntactic and semantic analyses of negation and of the use of negation in early L2 are presented. Then what is known about the influence of syntactic and semantic factors during online sentence processing is briefly summarized. Based on this, predictions for processing cost in different types of negated sentences are derived from the different analyses of negation. A series of self-paced listening experiments designed to test these predictions is presented. The results provide evidence for a strong influence of semantic transparency in beginning learners. However, learners also showed sensitivity to formal properties of the target language. It is argued that this effect may be due to a preference for frequent over infrequent target language strings rather than resulting from the application of grammatical knowledge. The chapter concludes with a discussion of the implications of these results for different approaches to second language acquisition and for the interpretation of data from language processing to inform theories of second language knowledge.

1.1 Syntactic analyses of negation in learner language

This section presents analyses of negation in learner language that take a generative perspective on language acquisition. In the first part, the analysis of negation in the target languages and the source language is presented upon which the relevant studies agree. In

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between speakers drawing on production-specific knowledge and listeners drawing on comprehension-specific knowledge could hardly work. Note also that it can be assumed that the knowledge language learners use for production has been built up by being exposed to the target language as a comprehender.

the second part, the results of these studies are summarized, in particular, the syntactic structures that they attribute to early learner utterances.

1.1.1 The syntax of negation

Figures 1 and 2 show the phrase structure of German and French negated declarative main clauses (following Parodi, 2000, who cites Grewendorf, 1988, 1992 and van Stechow and Sternefeld, 1988 for the German structure and Meisel, 1997, who cites Zanutti, 1989, for the French structure):

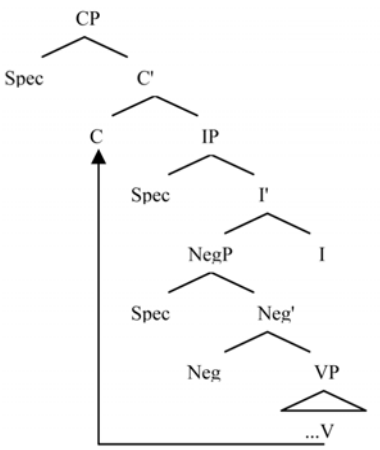

Figure 1: Phrase structure of German negated main clause

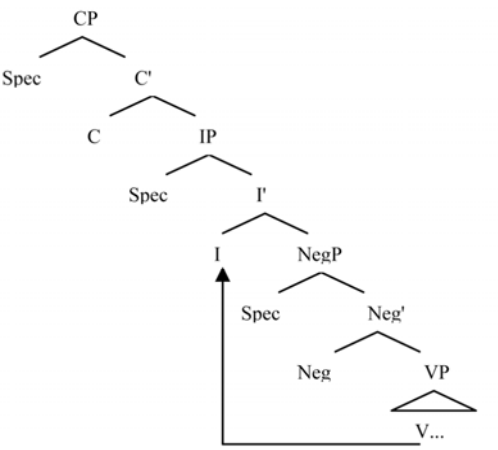

Figure 2: Phrase structure of French negated main clause

There are differences between these assumed phrase structures (first, all categories are head-initial in French, whereas IP and VP are head-final in German, and second, finite verbs have different landing sites), but both languages share the property that finite verbs raise out of the VP to the left of negation (as indicated by the arrows). This means that they follow the negative element in the underlying structure, but precede it in the surface structure. Non-finite verbs, which remain in the VP, follow the negator in both structures. This is illustrated in (1) and (2):

(1) der Junge will nicht schreiben
the boy want$_{FIN}$[3] not write$_{INF}$

[3] Throughout the thesis, finite verb forms are glossed as subscripted FIN, infinitival forms as subscripted INF and past participles as subscripted PP. In case a form can correspond to more than one of these categories, both are indicated. More detailed glosses are used in some cases, in particular for Turkish examples. In these glosses, the Turkish negation morpheme is glossed as 'neg', progressive aspect as 'prog', past tense as 'past', singular as 'sg',

(2) le garçon veut pas écrire[4]
the boy $want_{FIN}$ not $write_{INF}$

This does not hold in subordinate clauses, in which the two target languages differ in word order: In German, the finite verb remains in the VP, so that the negator precedes the verb, as illustrated in (3). In French, subordinate and main clauses have a similar structure, so that the negator follows the finite verb in subordinate clauses as well, which is illustrated in (4):

(3) ich glaube dass der Junge nicht schreiben will
I think that the boy not $write_{INF}$ $want_{FIN}$

(4) je crois que le garçon veut pas écrire
I think that the boy $want_{FIN}$ not $write_{INF}$

From a syntactic point of view, Turkish is similar to German and French in that the finite verb also raises over the negator. Apart from the fact that in Turkish all categories are head-final, the phrase structures given above are thus identical to the phrase structure assumed for Turkish negated clauses (Haznedar, 1997; Ouhalla, 1991).[5] However, on the surface, a Turkish negated clause looks very different from German and French negated clauses in that negation is usually expressed as a verb suffix, and not as a particle:

(5) çocuk yaz-mak iste-mi-yor
boy write-inf want-neg-prog.3sg

The finite verb thus precedes the negative element, but this might be less obvious than in German and French as the two forms are fused in one (together with markers of tense and agreement). Moreover, as also illustrated in (5), non-finite verbs precede both the finite verb and the negative element on the surface structure in Turkish, so that there is not such a clear correlation between finiteness of the verb and its position on the surface as in German and French. The same word order holds in subordinate clauses. There are two other

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plural as 'pl' and person markings are indicated by the numbers 1-3. Moreover, in section 1.2 of this chapter, glosses are used for information structural concepts such as assertion ('ast'), negation ('neg'), background and focus.

[4] In formal French, negation is bipartite: Apart from the negator *pas* following the verb, there is also a negator *ne* which precedes the verb. As *ne* is very frequently omitted in spoken French, the input language to the learners, this is not taken in account in the present study.

[5] To be more precise, I is assumed to be split in two further functional categories, AgrP and TensP, in all three languages (Ouhalla, 1991; Pollock, 1989), and the verb raises to Agr in Turkish (Haznedar, 1997; Ouhalla, 1991). As this split plays no role for the current study, it is omitted in the figures for ease of presentation.

negative elements which are mainly used in sentences without a verbal predicate, *değil* and *yok*. These elements can appear in any position in the sentence, but most often, they are placed sentence-finally, and take the tense and agreement inflection that is otherwise attached to the verb (Lewis, 1967). An example is given in (6):

(6) (siz) bir yazar değil-di-niz
(you) a writer not-past-2sg
'you are [*sic*] not a writer' (Haznedar, 1997)

To sum up, all three languages share the property that finite verbs precede the negative element in main clauses. They differ, however, in the position of non-finite verbs, the existence of verbless clauses, verb placement in subordinate clauses and in the nature of the negative element(s).

1.1.2 Results and analyses in syntactically oriented studies

Syntactic studies of the acquisition of negation differ in their assumptions about the initial state of L2 knowledge of negated phrases, about if and how this knowledge changes during the acquisition process, and about whether or not a native-like state of knowledge can ultimately be achieved.

As for the initial representations, some proponents of syntactic approaches assume that these representations are transferred from the native language (Haznedar, 1997; Schwartz and Sprouse, 1994, 1996). For Turkish learners of German or French, this would mean that they should rapidly be able to construct a native-like syntactic representation of target language negated utterances, as knowledge about the raising of the verb over the negator should be transferred from the source language. Other researchers hold that L2 learners initially do not transfer their native language phrase structure, but that instead, they have to rely on the knowledge provided by UG (Epstein et al., 1996). Epstein et al. (1996) assume that this means that both children learning a first language and adults learning a second language have access to all functional categories presented in Figures 1 and 2 from the onset of acquisition on (following claims by among others Poeppel and Wexler, 1993, for L1 acquisition). What has to be acquired are then only target language-specific settings. Both approaches cited so far thus assume that learners have a complete phrase structure representation from the onset of acquisition and that they very rapidly adapt this structure to the target language-specific configuration. Based on this, one would predict that negated clauses are realized in a completely target-like way from very early on in the acquisition process. That is, they should contain a finite verb which should be placed in the correct surface position to the left of the negator. Empirical studies have shown that this is a possible —but not the only— type of negated utterance that can be found in early learner

language. Prévost and White (1999, 2000) report that in French and German as L2, there are two negated utterance types that can often be found: utterances containing finite verbs preceding the negator, and utterances containing non-finite verbs following the negator. Examples are given in (7) for a finite clause and in (8) for a non-finite clause:

(7) ich spreche nicht deutsch
I $speak_{FIN}$ not German

(8) pas demander les papiers
not ask_{INF} the papers (Prévost and White, 1999)

How can approaches assuming native-like syntactic representations account for structures such as (8)? Prévost and White (1999) propose the so-called truncation hypothesis, which has been postulated before for child language (Rizzi, 1993/1994, 1994). According to this hypothesis, (child and) adult learner grammars would include the possibility to only project part of the phrase structure for a given utterance. For example, the structure for a given utterance may only include a VP and a NegP, but no higher functional categories. This would lead to utterances of type (8), in which the verb is non-finite and remains in the VP to the right of negation. Finite verbs and verbs in raised positions are excluded by this structure, as it does not provide the functional categories in which these could be realized. Prévost and White (1999) assume that both full and truncated structures can co-occur in early learner language. This explanation can account for the most frequent utterance types in early learner language. However, learners sometimes also produce utterances in which either a finite verb appears in an unraised position, or a non-finite verb in a raised position. If learners have native-like syntactic representations, raising should depend on finiteness of the verb, as it does in native speakers' utterances. Prévost and White (2000) account for finite verbs in unraised positions, which they claim to be very rare, by assuming that these forms are not truly finite, but carry very frequent suffixes that might be analyzed by learners as default suffixes. They account for non-finite forms in raised positions by similarly assuming that non-finite forms can be used as default forms, and that default forms can be used in finite positions when learners fail to retrieve the correct finite form.

Other researchers working in the generative framework have drawn different conclusions from the variability in verb morphology and verb placement. They have concluded that learners have no access to native-like phrase structure from the onset of acquisition. Approaches following this line differ in what parts of the phrase structure they assume to be transferred from the native language, if transfer takes place at all. First, proponents of the so-called local impairment approach assume that the whole phrase structure can be transferred from the first language, but that the representation of the feature

strength of functional categories is not transferred and in fact remains impaired in a second language (Beck, 1998; Eubank, 1993/94, 1996). Cross-linguistically, the feature strength of verbal functional categories determines whether finite verbs raise or not (Chomsky, 1995). German, French and Turkish are verb-raising languages because the verbal features in these languages are strong. Eubank (1993/94, 1996) and Beck (1998) assume that this setting can neither be transferred from the L1, nor acquired during the acquisition of the L2. Consequently, they assume that verb raising is optional and not linked to finiteness, predicting that both finite and non-finite verbs should be found in both positions in learner language. Second, in the so-called structure building account (Vainikka and Young-Scholten, 1996a, 1996b, see also Parodi, 2000), it is assumed that what is transferred from the first language are only lexical categories, such as the VP, but no functional categories. In the very early stages of acquisition, learners should only be able to produce utterances corresponding to this structure, that is, they should only produce verbs in an unraised position. Vainikka and Young-Scholten (1996a, 1996b) assume that finiteness marking on the verb has not yet been acquired at this stage of acquisition, so that verbs appear either in a non-finite form or another form that can be used as default form, for example the bare stem. They further assume that functional categories are then gradually built up by exposure to the target language. First, learners would build an underspecified functional projection to which both finite and non-finite verbs could optionally raise. This explains the occurrence of non-finite forms in raised positions, and the co-occurrence of raised and unraised structures. Vainikka and Young-Scholten (1996a, 1996b) assume that only after finiteness marking on the verb has been acquired and learners are able to use this consistently, they also develop a native-like verbal functional projection to which finite verbs obligatorily raise. Finally, Meisel (1997) accounts for variability by claiming that second language learners, contrary to young children, no longer have access to UG and cannot build up functional categories in a second language. He assumes that second language learners cannot build up any syntactic structure and have to rely on learning mechanisms that can be applied to surface strings.

To sum up, different kinds of syntactic structure have been claimed to underlie negated utterances in early learner language. First, learners could have access to a full phrase structure including verbal functional categories. If this phrase structure is assumed to include a setting for feature strength, the surface order of the sentence should contain a verb in raised position whenever the whole structure is projected (Prévost and White, 2000; Vainikka and Young-Scholten, 1996a, 1996b). The verb could take a finite or non-finite form depending on whether learners rely on a default form or not (Prévost and White, 2000), or depending on whether an underspecified or a native-like functional category is projected (Vainikka and Young-Scholten, 1996a, 1996b). Alternatively, when assuming that the phrase structure is locally impaired, verbs should appear on both sides of the

negator, as raising should be optional (Beck, 1998; Eubank, 1993/94, 1996). Finiteness marking on the verb should in that case be independent of the verb's position. In addition, according to at least some approaches, learners sometimes only project a reduced structure which does not contain higher functional projections (Prévost and White, 1999; Vainikka and Young-Scholten, 1996a, 1996b). This structure is sometimes thought to be the only possible structure in early phases (Vainikka and Young-Scholten, 1996a, 1996b), but different approaches agree that it can remain an optional alternative to full structures in later phases (Prévost and White, 1999; Vainikka and Young-Scholten, 1996a, 1996b). If this structure is projected, the surface order should show non-finite verb forms to the right of the negator. Finally, it has also been claimed that learners have no complex syntactic structure whatsoever and have to rely on the learning of surface patterns (Meisel, 1997). It is hard to derive a clear prediction from this last approach, as the assumed learning mechanism is not further specified. However, it can certainly be concluded from Meisel (1997) that all possible surface strings should be acceptable and producable by learners, although the frequency of their occurrence would probably be assumed to depend on the frequency in the input. This point is taken up below.

Taking all these proposals together, it is tempting to think that all possible descriptions of learners' linguistic competence with respect to negated sentences have been provided. However, all these proposals ignore one dimension: the meaning of the sentence and of negation in particular, and its possible influence on the surface structure of the utterance. This dimension is discussed in the next section.

1.2 Semantic analyses of negation in learner language

Semantically oriented research on second language acquisition has mainly been conducted in studies that follow the learner varieties approach.[6] In contrast to generative approaches, this approach holds that purely syntactic descriptions cannot capture the early stages of acquisition well. At early stages, syntactic properties of the source language and potentially innate syntactic knowledge as provided by universal grammar are thought to be of little influence on the structure of utterances. In addition, it is assumed that acquiring the target language syntax is a slow process. Following from these two assumptions, it is assumed that there are few constraints in early learner language that are *syntactic* in nature in the sense of generative approaches. Rather, it is claimed that syntactic structure in early learner language is restricted to a simple adjunction of different phrases (Dimroth et al., 2003).

[6] The term "learner varieties approach" refers to the functional perspective on second language acquisition taken in the European project that was presented in the introduction (Klein and Perdue, 1992; Klein and Perdue, 1997; Perdue, 1993). The name is used to imply that in this approach, learner language is taken as a variety in its own right rather than as a deviant version of the target language. Klein and Perdue (1997) show that studying this variety can yield insights into cross-linguistically valid principles of utterance organization, as learners rely on these as long as they have not acquired language-specific organization principles.

What determines the order of these phrases are then general semantic and pragmatic principles that learners can rely on because they are cross-linguistically valid. An example would be that phrases referring to topical parts of the utterance precede those referring to predicative parts (Dimroth et al., 2003). Only in a subsequent step would learners build up the syntactic structure of the target language, and semantic and syntactic constraints would then interact to determine utterance structure in a similar way as in native speakers. In the following, it is shown how the acquisition of negation has been described from this perspective. First, the semantic properties of negation are briefly presented, and second, acquisition studies that have taken these properties into account are summarized.

1.2.1 The semantics of negation

According to Klein (submitted), the meaning contribution of negation is such that a sentence containing negation is marked to be not true at the same time as the same sentence not containing negation, provided both sentences speak about the same situation - the 'topic situation'. This analysis of negation presupposes the understanding of utterances as descriptions of a particular topic situation (see Klein, 1994, 1998, 2006). That is, it is assumed that each utterance refers to a certain topic situation, parts of which can be explicitly referred to in the utterance, and provides a description that holds for this situation. For example, the utterance "The boy writes to his aunt" claims, according to this analysis, that for a certain time and place, which is left implicit, it is true that the boy writes to his aunt. The negated version of the utterance, "The boy does not write to his aunt", then marks this particular description of the topic situation as false. However, it leaves open which of the many other possible descriptions are true. The utterance "The boy does not write to his aunt" could be true (and, consequently, "The boy writes to his aunt" false), for example because the boy does not write at all at the relevant topic time, or because he writes to somebody else, to take but two possible readings. There is thus one part of a negated sentence that is more directly affected by negation than the other parts, because it constitutes the part in which the negated sentence is different from a true description of the situation. In the following, this part is referred to as the part which is in the semantic scope of negation.[7] In the first reading of the example, the whole VP is in the semantic scope of negation, whereas in the second reading, only the PP is in the scope of negation.

The scope-bearing property of negation raises the question of how speakers convey to the hearer what the scope of negation is in a given utterance. Two tendencies are frequently mentioned in the literature on negation. First, in many languages, the negator

[7] This has to be distinguished from syntactic scope. Syntactic scope refers to the parts of the sentence that, based on the sentence form, could be semantically affected by the negator, whereas semantic scope refers to those parts of the sentence that are semantically affected (see e.g. Horn, 1989). Syntactic scope is determined by the phrase structure of the sentence. It is not further investigated here.

tends to precede the element it semantically affects (Dahl, 1979). Second, in any given language, negation most often takes scope over the predicative part of the sentence which generally includes the verb. Horn, for example, classifies predicational negation as the 'prototype' of negation (Horn, 1989: 452). Scope over the verbal predicate can thus be considered the 'default' scope of negation. Utterances in which the negator takes narrow scope over a specific part of the sentence which does not include the verb are of course possible, but they are less frequent and most often, a specific discourse context is required so that hearers derive this meaning.[8]

Typological studies show that, indeed, cross-linguistically, preverbal negation is more common than postverbal negation, in particular among those languages in which the negative element is a particle (Dahl, 1979). This tendency is termed 'Neg First' principle by Horn (1989):

> The Neg First principle expresses the strong tendency for negative markers to gravitate leftwards so as to precede the finite verb or other possible foci of negation. (Horn, 1989: 452)

Even for those languages which have a postverbally placed negative particle, it has been argued by Jespersen as early as 1917, that diachronically, this structure has often developed from preverbal negation. Preverbal negation is considered to be a 'natural' pattern. Jespersen refers to this as:

> The natural tendency,... for the sake of clearness, to place the negative first, or at any rate as soon as possible, very often before the particular word to be negatived (generally the verb). (Jespersen, 1917: 5)

If placing the negator before the verb is a cross-linguistically valid semantic principle, a learner varieties approach to language acquisition would expect preverbal negation to be the dominant pattern in early learner language. This has in fact often been noted in the syntactically oriented studies summarized above. Many authors report that the pattern in which the negator precedes the verb is particularly frequent in early learner language, and that postverbal negation is then only gradually acquired, although this is not explained on semantic grounds in these studies (Parodi, 2000; Vainikka and Young-Scholten, 1996a, 1996b). The same observation has been made earlier in other studies on second language acquisition that do not take a generative perspective. These studies have found that preverbal negation is preferred at least during a certain phase of development independent

[8] Often, they also require the constituent in the scope of negation to be intonationally highlighted.

of the position of the negator in both the source and the target language. For example, Stauble (1984) investigates the acquisition of English negation by Spanish and Japanese learners and finds that although negation is preverbal in Spanish, but postverbal in Japanese, both groups of learners use preverbal negation in early phases of development and only acquire postverbal negation later on. Similarly, in a study investigating the acquisition of postverbal negation in Swedish by learners of 35 different source languages, Hyltenstam (1977) concludes that there is a universal tendency to place the negator preverbally. Wode (1981) reviews the literature on negation in both first and second language acquisition and concludes that the tendency to place the negator early in the sentence, and in particular before the verbal predicate, is a universal tendency that can be found in all types of language acquisition:

> In particular, it will emerge that the non-anaphoric types neg X and Subj neg vp are universal and non-age dependent in the sense that they occur in all non-pathological types of language acquisition so far investigated and with learners of all age groups. This will then explain why L2 learners are capable of going back to archaic types of developmental structures. (Wode, 1981: 205)

All these studies converge on the finding that preverbal negation is a preferred utterance pattern in early learner language. However, they do not make more detailed proposals concerning the semantic knowledge underlying negated utterances, and how it might interact with the developing syntactic representation of the target language. This is done in more detail in later studies, in particular by Becker (2005) on German and Giuliano (2003) on French. These studies are presented in the following paragraph.

1.2.2 Studies on negation from a learner varieties' perspective

Becker (2005) adopts the learner varieties perspective on language acquisition. In line with this perspective, she assumes that in early learner language, the position of elements in an utterance reflects the underlying information structure in a particularly clear way. Based on Rooth (1985) and Klein and von Stechow (1982), Becker (2005) assumes that the lexical content of most utterances can be partitioned into a background and a focus part.[9] The background comprises "the entity talked about and the spatial and temporal location denoted by the utterance" (Becker, 2005: 268). The focus represents "one element out of a contextually given set of activities" (Becker, 2005: 268) which holds for the background. In a simple affirmative utterance such as (9), the first element, in this case the subject, is a backgrounded entity, whereas the verb phrase is the focus of the sentence:

[9] Becker (2005) also investigates utterances in which this is not the case and negated versions of these, which are not going to be discussed in the present study.

(9) der vater schläft
the father (background) $sleep_{FIN}$ (focus)

According to Becker (2005), in negated utterances, the function of negation is to express that the focus does not hold for the backgrounded entities (or times and places).[10] She presents a negated utterance very similar to (9), in which this function is expressed in the surface order of elements:

(10) mein vater nicht ($_{neg}$ schlafen)
my father (background) not (neg) $sleep_{INF}$ (focus) (Becker, 2005: 287)

The position of the negator between the background and the focus is, according to Becker, a direct reflex of the underlying semantic relations in the utterance. The negator specifies the relation between the two elements by expressing that the focus does not hold for the background. In addition, the position of the negator directly preceding the focus makes clear that the focus is in the semantic scope of negation in the sense explained above, which is indicated by the parentheses. Utterance (11) illustrates this information distribution in a case in which the subject entity (the speaker) is left implicit:

(11) in de nacht nicht ($_{neg}$ schlafen)
at the night (background) not (neg) $sleep_{INF}$ (focus) (Becker, 2005: 287)

It is no coincidence that these utterances are uttered by a speaker who has not yet acquired finiteness marking, as evidenced by the infinitival form of the verbs. According to Becker, the information distribution changes when finiteness comes into play. Based on Klein (1998), she analyses finiteness as a scope-bearing operator, just as negation is. The function of this operator is to express assertion. Thus, whereas negation expresses that the part of the utterance over which it has scope does NOT hold for the current topic situation, finiteness, according to Klein (1998), expresses that the part of the utterance over which it has scope DOES hold for the current topic situation. In simple affirmative utterances, the scope of assertion thereby usually corresponds to what Becker (2005) calls the focus of the utterance. To illustrate the function of finiteness, it is useful to first consider utterances in which finiteness is expressed by a finite light verb, as in (12):

(12) der junge hat ($_{ast}$ geschrieben)
the boy (background) has (ast) $write_{PP}$ (focus)

[10] This is in line with the analysis by Klein (submitted), even though it is phrased slightly differently. In terms of Klein, the focus is the element in which the utterance differs from a true utterance.

Following the analysis proposed by Klein (1998), the main function of finiteness marking on the auxiliary is to express that the action of 'writing' holds for the boy in the current topic situation. In a negated sentence containing a finite verb, two scope-bearing operators thus come together. In light verb sentences, the scope of these two operators is marked transparently, as in the learner utterance (13) presented by Becker (2005):

(13) er hat ($_{ast}$ nicht ($_{neg}$ die zug gesehen))
he (background) has (ast) not (neg) the train see$_{PP}$ (focus)
(Becker, 2005: 93)

Both operators have scope over the focus part of the utterance, and this is marked in a transparent way as both of them precede the focus.[11] This is different in sentences with finite lexical verbs. Consider the native-like finite utterance (14):

(14) der Junge ($_{ast}$ ($_{neg}$ schreibt) nicht)

In this utterance, the scope of assertion is marked nearly as transparently as it is in light verb utterances. The only difference is that in lexical verb sentences, finiteness marking is fused with an element that is in itself in the scope of the finiteness operator, namely, the lexical verb. However, scope marking for negation is not transparent anymore, as the scope of the negator is now to the left. In the grammar of German, transparent marking of the scope of assertion thus 'wins' over transparent marking of the scope of negation. This is something that learners have to acquire when they start marking their utterances for finiteness. According to Becker, this development can be described as a sequence of three stages.

At a first stage, learners do not produce light verbs yet and rely on transparent marking of the scope of negation in lexical verb sentences, such as in (10) and (11). As mentioned above, finiteness is not yet marked on these lexical verbs and there is thus no overt assertion operator and no conflict between marking the scope of negation and marking the scope of assertion. At a next stage, learners start to use finite light verbs. If these sentences are negated, the light verb is placed before the negator, as in (13). Learners are thus sensitive to the scope properties of finiteness from early in the acquisition process on. As soon as they use finite light verbs, they place these verbs in a position preceding the negator, even if they use preverbal negation with lexical verbs. At a third stage, learners acquire the fact that finiteness can also be marked on lexical verbs. This forces them to give

[11] Becker (2005) assumes that utterances such as (13) are asserted negations, not negated assertions, which have another structure and are treated separately in her study. This means that the scope of the assertion operator includes the negator, and this is also transparently marked.

up the transparent marking of scope relations, and place the lexical verb that carries the assertion operator before the negator, as in (14). Becker (2005) claims that learners are only able to form utterances like (14) after they have acquired the use of light verbs as in (13), because this structure would make the function and scope of finiteness transparent to them. This order of acquisition has in general been confirmed for Germanic languages (see e.g. Dimroth, 2008; Verhagen, 2009). However, the transition between the stages is slow, and, as has also been observed in the syntactically oriented studies summarized above, pre- and postverbal negations with lexical verbs co-occur for an extended period of development.

Giuliano (2003) provides a very similar analysis of the development of negation in Spanish learners of French. In early phases of development, these speakers never place lexical verbs to the left of the negator. Negative utterances mostly contain a negative chunk which has the form *nepade* or *nepa*, and appears before the to be negated verb. An example is given in (15):

(15) mais moi nepade ekribir
but me not/is not write$_{INF}$
'but I cannot write' (Giuliano, 2003: 128)

The negator *nepade* could represent French *n'est pas de*, in which case it would contain a light verb. It might also be an unanalyzed form that in the mind of the learner does not contain any verb. Utterance (15) is thus either similar to utterances of type (10) and (11) or to utterances of type (13) in learners of German. Clear examples of preverbal negation with *pas* only are not reported by Giuliano (2003). The first two stages of the model proposed by Becker (2005) are thus hard to distinguish in these data.[12] However, the results are similar in that Giuliano (2003) also reports that light verb forms (those that might not have been analyzed by the learner as well as clearly analyzed ones) always precede the negator, whereas postverbal negation with lexical verbs only appears at a relatively late stage of development, in which learners use finiteness marking on lexical verbs productively. An example is given in (16):

(16) la personne ne travaille pas
the person (neg) work$_{FIN}$ not[13] (Giuliano, 2003: 129).

[12] See, however, Véronique (2004), who investigates the acquisition of negation in two Arabic learners of French from a very similar perspective as Giuliano (2003) and reports that *pas* can be used preverbally in early phases of development at least by one of the learners investigated in his study.

[13] These learners also use the preverbal negator *ne* in addition to the postverbal *pas*. This is most likely due to transfer from their first language, Spanish, in which negation is expressed by the preverbal negator *no*. Uses of *ne* were extremely scarce in the present corpus from Turkish learners.

Similarly to Becker (2005), Giuliano (2003) also assumes that light verbs precede the negator because they do not carry lexical information, which would be in the scope of the negator, but tense and aspect information, which belongs to the topical part of the utterance which is not affected by negation.

Summing up the different analyses of negation in learner language, there are some observations upon which different studies converge. The following characteristics are reported in many different studies, Prévost and White (1999), Vainikka and Young-Scholten (1996a, 1996b), Parodi (2000), Becker (2005) and Giuliano (2003), among others:

- At early stages of development, preverbal negation is the dominant pattern with lexical verbs.
- After postverbal negation with lexical verbs is acquired, it co-occurs with preverbal negation for an extended period of development.
- There is a tendency for lexical verbs appearing before the negator to take a finite form and for lexical verbs appearing after the negator to take a non-finite form.
- Light verbs consistently appear before the negator.

However, very different analyses have been provided for this pattern of results. In particular, analyses differ in whether they assume that the observed patterns can be explained in syntactic terms only. If so, preverbal negation is seen as a consequence of the use of truncated structures, or of missing feature values of verbal functional categories. The fact that verbs appearing in this context are predominantly non-finite is then explained by the absence of native-like verbal functional categories in the underlying syntactic structure. In contrast, preverbal negation can also be seen as a consequence of structuring utterances according to semantic principles in the absence of strong syntactic constraints, as has just been shown. For early learners, the fact that verbs to the right of the negator are mostly non-finite is then explained by the assumption that learners have not acquired finiteness marking at all at this stage and rely mainly on non-finite default forms. For more advanced learners using both pre- and postverbal negation, the contingency between finiteness and verb placement can be explained by assuming that learners are sensitive to the scope-bearing properties of finiteness and therefore do not place finite verbs after the negator.

At this more advanced stage of development, the explanations given by syntactic and semantic approaches can be seen as mutually compatible explanations which focus on a different level of observation. There can be syntactic and semantic aspects of finiteness that both influence the structure of an utterance, and proponents of all approaches presented here would probably agree in the assumption that this is indeed the case, even though they might restrict their analyses to syntactic or semantic aspects only.

At early stages of development, however, in particular stages that precede the acquisition of finiteness, different approaches make different assumptions about what the nature of the constraints is that govern utterance structure. Syntactic approaches assume that verbs appearing in an unraised position appear in this position because this is the only position provided by the underlying syntactic structure. Semantic approaches, in contrast, do not assume that the order of the verb and the negator is determined by *syntactic* constraints at this level of development. At this early stage, it is assumed that the constraints governing the order of the verb and the negator are *semantic* in nature.

The aim of the present study is to test the conflicting ideas about the nature of the constraints in early learner language by investigating the processing of negation. In order to derive predictions from the two types of explanations, it is necessary to first consider the results of studies that have investigated the use of syntactic and semantic information during the processing of utterances for comprehension.

1.3 Syntactic and semantic factors in sentence processing for comprehension

In this section, a brief overview is given of how syntactic and semantic factors influence processing cost during comprehension in native and second language comprehenders.

1.3.1 Syntactic and semantic factors in native speakers' processing

It is well-established that during comprehension, native comprehenders process sentences incrementally, that is, they analyze the unfolding sentence in a word-by-word fashion, adding every incoming word to the current analysis (see Just and Carpenter, 1987, and Pickering, Clifton and Crocker, 2000, for overviews). If an incoming element is incongruent with the analysis performed up to that part of the sentence, this leads to a higher processing load for the comprehender, who will process that part of the sentence more slowly when compared to the same element in a comparable sentence in which smooth integration is possible. This effect can be measured using self-paced reading or eye-tracking during reading methods, in which the reading times for each segment of an incoming written sentence can be determined and comparative processing difficulty or ease can be measured (Just, Carpenter and Woolley, 1982; Rayner, 1977; Rayner, 1998).

A new element may be incompatible with the previous analysis for different reasons, in particular, it might be *syntactically* or *semantically* incongruent. Studies have shown that these two types of incongruence can both lead to a delay in processing. As an example of an effect that seems to be purely morpho-syntactic in nature, Pearlmutter, Garnsey and Bock (1999) showed in a self-paced reading and eye-tracking study that native speakers read a verb form particularly slowly when there was an agreement error on the verb, relative to correctly agreeing verbs in comparable sentences. This is an important finding because contrary to production, where speakers cannot avoid producing some form

of agreement in languages in which this is obligatory, hearers may be able to choose to ignore agreement cues and still understand the sentence. The results of Pearlmutter et al. (1999) thus show that comprehenders are influenced by morpho-syntactic properties of the input even if they do not seem to be crucial for understanding.

As for an even stronger violation, a study by Weyerts, Penke, Münte, Heinzen and Clahsen (2002) shows that native speakers of German slow down in self-paced reading when encountering main clauses in which the finite verb appears clause-finally instead of in second position. Again, it is interesting that this is the case because speakers could no doubt also understand the verb-final clauses, as they generally do in subordinate clauses. The preference for a verb in second position in main clauses, even in comprehension, again shows that comprehenders are remarkably sensitive to syntactic factors.[14]

This does not of course exclude the fact that semantic factors also play a role in processing cost, and this has indeed been shown to be the case. Consider sentences (17a-d), which were tested in a study by Pickering and Traxler (1998):

(17a) As the woman edited the magazine about fishing amused all the reporters.
(17b) As the woman edited, the magazine about fishing amused all the reporters.
(17c) As the woman sailed the magazine about fishing amused all the reporters.
(17d) As the woman sailed, the magazine about fishing amused all the reporters.

This set of stimulus sentences presents a test case for investigating the interplay between syntactic and semantic factors in processing for comprehension. Pickering and Traxler (1998) measured reading times on the different segments of these sentences and found several differences between the four sentence types that could be attributed to processing difficulties that were either due to syntactic or to semantic factors.

First, they found that the verb 'amused' was read more slowly in (17a) and (17c) than in (17b) and (17d). They interpret this as evidence of difficulties in constructing the *syntactic* structure of the sentence in (17a) and (17c) when compared to (17b) and (17d). This is plausible when assuming that comprehenders attempt to analyze the string "as the woman edited/sailed the magazine" as fully as possible before reading the end of the sentence. When doing so, they will already have analyzed 'the magazine' as object of the preceding verb, when finding out (upon reading 'amused') that in fact, it is the subject of 'amused'. The reanalysis of the syntactic structure is costly for the processor, and this is reflected in comparatively higher reading times. In (17b) and (17d), such a process does not

[14] Note that Weyerts et al. (2002) failed to find a grammaticality effect for word order in subordinate clauses, where finite verbs in second position were processed equally fast as finite verbs in final position. This means that whereas syntactic deviations can lead to processing difficulties, they need not do so in all cases. This is discussed in more detail below.

take place, as the comma prevents readers from ever analyzing the second noun phrase as the object of the preceding verb, and processing is easier.

Pickering and Traxler (1998) also found that the noun phrase 'the magazine' was read more slowly in (17c) than in the other three sentence types. This, according to them, reflects difficulties in constructing a *semantically* plausible analysis. In (17a), 'the magazine' can plausibly be analyzed as the object of 'edited', whereas in (17c), it is an implausible object of 'sailed'. Just as it takes time to reconsider a *syntactic* analysis, it also takes time to consider a *semantically* implausible sequence, leading to longer reading times on 'the magazine' in (17c) as compared to (17a). As in (17b) and (17d), no analysis of 'the magazine' as object of the preceding verb is attempted, it can be processed equally fast in these two conditions and faster than in (17c).

Finally, Pickering and Traxler (1998) found that 'amused' was read even more slowly in (17a) than in (17c). This reflects again a *semantic* effect, which in this specific case influences how costly it is for comprehenders to revise their initial syntactic analysis. As the initial analysis is plausible in (17a), comprehenders find it particularly hard to reanalyze 'the magazine' as the subject of the following clause in this sentence. In contrast, in (17c), they are presumably less committed to the implausible analysis of 'the magazine' as object of 'sailed', and, as a consequence, take less time to revise this analysis upon encountering 'amused'. To sum up, Pickering and Traxler (1998) demonstrate that syntactic and semantic factors both influence processing cost during sentence comprehension in native speakers, and that they do so rapidly, on whichever incoming word causes a problem in syntactic or semantic terms. However, the results leave several questions open.

First, the fact that both syntactic and semantic factors can influence processing cost *rapidly* does not exclude that one type of process is applied systematically *earlier* than the other. The question whether this is the case or not has been central in the research on native speakers' sentence processing since the first studies conducted on this topic. There is one line of research which advocates the view that there is a primacy of syntactic processing, in the sense that syntactic processing always takes place independently and prior to the application of constraints of any other nature (Frazier and Fodor, 1978; Frazier, 1979; Friederici, 1995; Friederici, Gunter, Hahne and Mauth, 2004; Gorrell, 1995; Pritchett, 1992). Against this view, others have argued that not only different types of information are processed at the same time, but also, that there is no principled difference between syntactic constraints, semantic constraints and other types of constraints, in that they are all learnt, represented and put to use in similar ways by the language processing system. There would thus be no separate module dedicated to the representation and processing of syntactic knowledge (MacDonald, Pearlmuuter and Seidenberg, 1994; Marlsen-Wilson and Tyler, 1980; Spivey and Tannenhaus, 1998; Stevenson, 1994; Trueswell, Tanenhaus and Kello, 1993). The present study does not attempt to decide between these possibilities which are

very difficult to tease apart. The main aim of the present study is to find out whether there is any evidence for the application of syntactic, semantic, or both types of knowledge in learners at all, not whether one is used earlier or later than the other.

Related to the issue of whether one type of constraint is used before the other, the results presented so far also leave open the question of what happens when two different types of constraints lead to conflicting analyses. Authors who assume a primacy of syntactic processing would assume that semantic factors only come into play after the syntactic analysis has been performed (see e.g., Friederici et al., 2004). However, recent studies have shown that semantically plausible interpretations might 'overrule' the outcomes of the syntactic analysis. For example, Ferreria (2003) has found that native speakers often interpret the sentence "The dog was bitten by the man" as meaning "The dog bit the man". According to Ferreira (2003), comprehenders apply a heuristic according to which in most utterances, the first noun phrase is the agent of the action denoted by the verb (see Bever, 1970; Townsend and Bever, 2001). When the application of this heuristic leads to a very plausible interpretation, speakers can apparently choose to ignore syntactic factors which pull for a different interpretation of the sentence (see Ferreria and Patson, 2007, for additional evidence). This outcome is interesting because it shows that in general, syntactic and semantic factors might best be seen as independent forces influencing both the processing cost and the final interpretation of the sentence, without one type of analysis being constrained by the other. However, again, the present study does not attempt to further test this claim in native speakers. Native speakers can obtain a plausible analysis of the negated sentences tested in the present study without having to ignore any syntactic factors. The materials used here thus do not allow for the pitting of syntactic and semantic factors against each other in native speakers.

However, for beginning learners, testing the processing of post- and preverbal negation clearly is a way to address just this question. It is therefore particularly relevant to summarize what is known about the interplay of syntactic and semantic factors in L2 processing.

1.3.2 Syntactic and semantic factors in L2 processing

It is well established that second language learners process sentences incrementally, just as native speakers do. For example, they show the same slow-down in reading on the second verb in sentences of type (17a) as native speakers, suggesting that they too construct a syntactic representation as soon as possible (Juffs and Harrington, 1995). As for semantic influences, it has been claimed that their weight as compared to structural constraints is stronger in second language comprehenders than in native comprehenders. Roberts and Felser (submitted) tested sentences of type (17a) and (17c) in a group of non-native comprehenders and a native control group. They found that learners were influenced in

their processing cost by the plausibility of the initial misanalysis more strongly than native speakers were. This suggests not only that learners take semantic information into account rapidly, but that its influence might be particularly strong when compared to native comprehenders. Similar suggestions have been made based on other data concerning the processing of syntactic ambiguity resolutions (see Clahsen and Felser, 2006, for an overview).

Taking this one step further, it has been claimed that learners process sentences in a more shallow manner than native speakers, being mainly influenced by lexical and semantic information and not computing a full syntactic structure at all. Evidence for this claim comes from studies investigating syntactic dependencies, in particular, so-called filler-gap structures in which one element of a sentence (the filler) is extracted from its original position (the gap) (see e.g. Marinis, Felser, Roberts and Clahsen, 2005; Felser and Roberts, 2007). For example, in a cross-modal priming study, Felser and Roberts (2007) presented native and non-native comprehenders with sentences as in (18):

(18) Fred chased the squirrel to which the nice monkey explained the game's difficult rules _ in the class last Wednesday.

In this sentence, the sequence 'to which' represents the filler, the original position of which (the gap) is indicated by an underscore. Participants in this study listened to auditorily presented sentences of this type and saw pictures which could appear at different time points during the presentation of the sentence. When a picture appeared, participants had to judge as quickly as possible whether the object or animal presented on the picture was alive or not. Felser and Roberts (2007) found that native comprehenders were faster in taking this decision for a picture of a squirrel presented in sentence (18) at the gap position, as compared to when the picture was presented earlier in the sentence, after the word 'game's'. No such facilitation at the gap position was observed in the non-native group. Felser and Roberts (2007) conclude that whereas native speakers postulate a full syntactic structure, which then leads to a reactivation of the filler at the gap position facilitating the decision, second language comprehenders do not project the entire syntactic structure. Similarly, Jiang (2004) claims that second language learners underuse morphological and syntactic information: The second language readers in this study were not significantly slowed down upon reading a verb that contained a subject-verb agreement error, unlike native speakers who were slowed down (Jiang, 2004).[15]

[15] Note, however, that in this study, the same numerical trend was found in the learner group as in the native speakers. The difference was that this effect reached significance in the native speakers, but not in the learners. This lack of a significant effect might be due to different learners in the task reacting differently to the stimuli,

Summing up, there is evidence that non-native comprehenders use both syntactic and semantic information to rapidly construct an interpretation for an incoming sentence. Second language comprehenders have been found to rely more on lexical-semantic cues and less on syntactic information when compared to native speakers. However, the structures that were tested to substantiate this claim were often very complex. It seems unwarranted to draw direct conclusions from the absence of filler-reactivations in sentences as (18) to the influence of syntactic constraints in simple negated sentences. Moreover, the learners who were tested in the studies summarized so far were quite advanced and usually highly educated. This leaves open the question how syntactic and semantic constraints interact in less advanced learners processing less complex structures, which are of more direct relevance to the current research questions.

Evidence from online processing in this type of learners mainly comes from studies using the sentence matching paradigm (Freedman and Forster, 1985), in which participants have to judge whether two visually presented sentences are identical to each other or not. Freedman and Foster (1985) found that native speakers were faster to correctly judge two matching sentences as identical when these sentences were grammatical than when they were not grammatical. This means that sentence matching can be used to compare the grammaticality of two different structures, according to the grammar of the tested participants. In addition to this, sentence matching has been shown to be sensitive to plausibility or semantic coherence, to the correctability of ungrammatical sentences, and to the complexity of the structure (Crain and Fodor, 1987; Murray, 1982). For these reasons, sentence matching could in theory be used to find out whether second language comprehenders are influenced in their processing cost by all these different factors, and whether some factors have a stronger influence than others. Sentence matching studies up to date have however mainly manipulated grammaticality (Beck, 1998; Clahsen and Hong, 1995; Eubank, 1993; Eubank and Grace, 1996). Moreover, it seems plausible that while sentence matching might be sensitive to a certain degree to all of the above-mentioned factors, it is probably particularly sensitive to factors related to sentence form as opposed to meaning. Participants have to hold the exact sentence form of the first sentence in memory in this task in order to compare it to the second presented sentence form. It is not possible for participants to simply parse the sentence for understanding and then match the obtained meaning against the meaning obtained from the second sentence, as extremely comparable meanings can be expressed by different sentence forms.

It might therefore not be surprising that the sentence matching studies mentioned above found that indeed, even relatively beginning learners seem to strongly react to formal properties of the presented material, in particular, grammaticality. Beck (1998), testing

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thereby increasing the overall variation. It thus seems problematic to conclude from this result that L2 learners in general would not react to agreement errors.

English learners of German, compared the matching times for grammatical pairs of type (19a) to ungrammatical pairs of type (19b):

(19a) Der Vater liest selten die Zeitung.
the father reads seldom the newspaper
(19b) *Der Vater dann schreibt ein Lied.
the father then writes a song

She found that a group of relatively beginning English learners of German[16] processed sentences of type (19a) faster than sentences of type (19b). Similarly, Eubank (1993) found that English learners of German who were comparable to those of Beck (1998) in that they were studying German in an English-speaking environment matched grammatical sentences containing subject-verb inversion faster than ungrammatical sentences in which inversion was missing. Finally, Verhagen (2009) conducted a study using oral sentence matching with a type of learner and a type of stimulus directly relevant to the present study: She tested how beginning Turkish and Moroccan learners acquiring Dutch in an immersion setting processed negated sentences with lexical verbs and auxiliaries in which the verb either occupied a raised or an unraised position. These learners can be assumed to be at a more beginning level than those tested by Beck (1998) and Eubank (1993). That is, the group for which the results are reported here produced an overwhelmingly high percentage of non-finite instead of finite utterances, and purely functional elements, in particular, auxiliaries, were completely absent from their production. The following four types of sentences were tested (note that Dutch is similar to German in all aspects relevant here):

(20a) Nadia en Bushra dansen niet op het feest.
Nadia and Bushra dance not at the party
(20b) *Nadia en Bushra niet dansen op het feest.
Nadia and Bushra not dance at the party
(20c) Nadia en Bushra hebben niet op het feest gedanst.
Nadia and Bushra have not at the party danced
(20d) *Nadia en Bushra niet hebben op het feest gedanst.
Nadia and Bushra not have at the party danced

[16] The participants were university students of German, and therefore it might appear that they were not real *beginning* learners. However, it can be assumed that they had much less exposure to German than the participants in the previously cited studies had to their second language, because in contrast to those later participants, the participants tested by Beck (1998) were not living in a German-speaking country.

Interestingly, the matching times were different for auxiliaries and lexical verbs. Whereas for auxiliary sentences, grammatical sentences were processed faster than ungrammatical ones, the reverse effect was found for lexical verb sentences. In these conditions, participants matched ungrammatical sentences containing an unraised lexical verb faster than grammatical sentences containing a lexical verb in a raised position.

What can be concluded from this series of results regarding the influence of syntactic and semantic factors in relatively beginning learners? As for the studies by Beck (1998) and Eubank (1993), it seems likely that the results are due to a structural effect. In the study by Eubank (1993), what was manipulated was the order of the subject and the verb, and participants preferred the order in which the verb precedes the subject (in a context in which this is grammatical in German). It is hard to see how this preference would arise on semantic grounds, as semantically, there should be a preference for first mentioning the topical entity and then the predicate (Dimroth et al., 2003). In the study by Beck (1998), the order of the adverb and the verb was manipulated, and it was found that learners prefer the order in which the adverb follows the verb. Adverbs have scope-bearing properties similar to negation, so that perhaps a certain order could be preferred for semantic reasons in these sentences. However, the adverbs used in the stimuli sentences by Beck (1998) differ in that some of them would typically take scope over the verb and others not, so that it is unlikely that any systematic semantic effect could have arisen on these grounds. It seems that these beginning learners prefer the raised structures for grammatical reasons.[17]

In contrast to this, the results obtained by Verhagen (2009) are more difficult to explain on purely syntactic grounds. From a syntactic perspective, the preference for a raised position for auxiliaries as reflected in the faster matching times seems to suggest that learners can project a verbal functional category making the appearance of verbs in a raised position possible (contra the assumption made by Vainikka and Young-Scholten, 1996a, 1996b for very early learners, and contra Meisel, 1997). Moreover, this category seems to have native-like properties, as one position is clearly preferred over the other for auxiliaries, speaking against optionality (contra Beck, 1998, and Eubank, 1993/94, 1996[18]). However, when assuming this, how can one explain that there is a preference for unraised structures for lexical verbs? This seems to indicate that learners can project a truncated structure next to the full structure, as suggested by Prévost and White, 1999 and Vainikka and Young-

[17] This need not mean that they prefer this structure because they have acquired syntactic constraints valid in the target language. Indeed, Beck (1998) argues that the preference might be due to a transfer of a similar structure from English that is possible for the raised, but not for the unraised stimuli.

[18] It is of course conceivable that there is optionality in the choice between two structures, but one of them is still preferred over the other. However, this does not seem to correspond to the notion of optionality adopted by Beck (1998) and Eubank (1993/94). At least in the cited studies, these authors conclude that raising is optional from the fact that no preference can be established.

Scholten, 1996a, 1996b for slightly more advanced learners. It seems possible that such a structure is projected for stimuli of type (20b), in particular because the subjects of these sentences are plural, and the plural form of the verb is homophonous to the infinitival form in Dutch. This means that there is no unambiguous finiteness marking on the lexical verbs, which could possibly have interfered with the construction of a truncated structure. However, what remains to be explained is why one type of structure is preferred for auxiliaries, and the other for lexical verbs. To explain this on purely syntactic grounds, one needs to assume that auxiliaries are *syntactically* different from lexical verbs in some aspect relevant here. Such a proposal is indeed made by Parodi (2000), who, based on Pollock (1989), argues that auxiliaries, but not lexical verbs, are used in early learner language as carriers of tense and aspect, using an option of UG which provides a special role for light verbs.[19] This is a possible explanation of the results obtained by Verhagen (2009). However, the results can also be explained on semantic grounds, by assuming that the learners tested by Verhagen (2009) are influenced in their processing cost by semantic transparency. As shown above, marking of scope relations is transparent for auxiliary sentences when auxiliaries appear in a raised position, and transparent for lexical verb sentences when lexical verbs appear in an unraised position (especially when clear markings of finiteness are absent). The results obtained by Verhagen (2009) can thus be explained by assuming that learners are influenced in their processing by the transparency of scope marking.

All in all, there are clear indications that relatively beginning learners' processing can be influenced by syntactic constraints (Beck, 1998; Eubank, 1993). However, the learners tested in these studies are probably at a more advanced stage of development than is relevant here. This does not hold for the participants in the study by Verhagen (2009), but the results of that study do not allow for the teasing syntactic and semantic explanations apart. Moreover, the results obtained so far for relatively beginning learners might be biased by the exclusive use, up to now, of the sentence matching task in this population. First, sentence matching has the disadvantage of providing only one integrated measure per sentence type. The possibility that different factors are of influence at different points in the sentence, and that these influences cancel each other out, cannot be excluded. Moreover, as mentioned above, sentence matching introduces a focus on the sentence form, and therefore seems particularly suited to the revealing of form-oriented knowledge only. The present study attempts to gain more fine-grained and more conclusive evidence about the relative weight of semantic and syntactic factors by using a self-paced listening task which avoids

[19] An alternative proposal with similar consequences is that auxiliaries are base-generated in a raised position (Vainikka and Young-Scholten, 1996a). Note however that the learners tested by Verhagen (2009) did not use auxiliaries in their production. To explain the results on syntactic grounds, it would thus have to be assumed that the participants already have a grammar which provides a position in which auxiliaries can be base-generated, but do not yet show evidence for this in their production.

these two disadvantages. The logic of the present study is presented in more detail in the next section.

2. The present study

The aim of the present study is to gain more conclusive evidence about the nature of the constraints that govern the production and understanding of negated utterances in beginning learners. To this end, different types of negated sentences were presented to beginning learners in a self-paced listening task (Ferreira, Henderson, Anes, Weeks and McFarlane, 1997, see also Booth, MacWhinney and Harasaki, 2002; Caplan, Waters, DeDe, Michaud and Reddy, 2006; Felser, Marinis and Clahsen, 2003). Participants thus had to pace their way through sentences segment by segment, by pressing a button after listening to each segment. It is well established that similar to self-paced reading[20], self-paced listening provides a measure of the relative ease and difficulty of the syntactic and semantic integration of incoming words or phrases into the unfolding representation of the sentence. As put by Caplan et al. (2006): "The assumption underlying the self-paced listening task is that, when lexical factors are eliminated, listening times to words or phrases presented one at a time reflect the time it takes to integrate lexical items into an accruing syntactic and semantic structure, and are therefore longer when this integration is more difficult." (Caplan et al., 2006: 118). The question addressed in the current study is precisely whether in beginning learners, it is the syntactic or the semantic integration which determines processing cost most. This question is investigated in five different experiments, which are presented in three sections in the following, summarizing results on lexical verb sentences in German, lexical verb sentences in French and auxiliary sentences in German and French. Each of these three types of experiments allows us to address a slightly different research question which together contribute to the teasing apart of syntactic and semantic influences. These research questions are briefly introduced in the following, and presented in more detail for each of the different experiments below. The research questions for the three types of experiments can be summarized as follows:

1) Research questions for lexical verb sentences in German:

a) Do learners of German process negated sentences with lexical main verbs faster when the verb follows than when it precedes the negator?

b) If yes, does this also hold for lexical verbs that are clearly marked for finiteness?

[20] Self-paced listening was used instead of self-paced reading because of the low educational background of many of the participants and the low level of proficiency in the target language. Due to these two factors, the participants tested here are not experienced readers in the target language. It was assumed that, had self-paced reading been used, this low level of experience might have lead to so much variation in reading times that potential effects of the experimental manipulation would not have been detectable any more.

If question 1a) is answered in the positive, this would confirm the results by Verhagen (2009) and exclude a number of possible syntactic accounts of negation, although it would not rule out all of them (see below for a more detailed discussion of the predictions of the different syntactic accounts). If question 1b) is also answered in the positive, this would provide additional evidence for the stronger influence of semantic as compared to syntactic factors in the learners' processing of negation.

However, as discussed in more detail below, a preference for pre- over postverbal negation in processing speaks for a semantic as opposed to a syntactic effect in particular if it can be found in learners who are clearly aware of the correct placement of verbs in the target language. This does not hold for the learners of German tested here, who, as shown below, prefer pre- over postverbal negation. In contrast, as will be seen in the next section, the learners of French tested here use the syntactically correct placement of verbs to the left of the negator relatively early in the acquisition process. They place the verb to the left of the negator at a stage of acquisition at which it still seems plausible, on a learner varieties approach, that the utterance organization is in other respects strongly influenced by semantic constraints.[21] If even these learners, who *produce* mainly postverbal negation, prefer pre- over postverbal negation in processing, this would provide stronger evidence for the presence of semantic as opposed to syntactic constraints than the results on German can provide. The questions investigated for these learners are:

> 2) Research questions for lexical verb sentences in French:
> a) Do learners of French, who place verbs to the left of negation in production, process negated sentences with lexical main verbs faster if the verb follows than if it precedes the negator?
> b) If yes, does this also hold for lexical verbs that are clearly marked for finiteness?

If these two questions are answered in the positive, this would rule out any account that assumes that the constraints influencing processing cost at this stage of acquisition can be

[21] The fact that correct verb placement to the left of the negator is taken as evidence for the acquisition of a grammaticised system in German (Dimroth et al., 2003), but, according to the present study, not in French, is due to the possibility that it is not or not in all cases *grammatical* knowledge that leads learners of French to violate the semantically transparent placement of the verb and negator. It seems much more likely that it is a consequence of the more consistent input in French, that pushes learners to opt for a raised position of the verb very early in the acquisition process, when their grammar as a whole is still largely influenced by semantic constraints. This assumed difference between producing a frequent grammatical structure because it is frequent, as opposed to producing a grammatical structure because it is grammatical and the learner in question has acquired the relevant grammatical knowledge, will be taken up and discussed in more detail in later parts of this dissertation. Note that syntactic approaches take any placement of verbs to the left of the negator as evidence for grammatical knowledge (see e.g. Prévost and White, 2000), so that it seems warranted to conclude that these approaches would attribute knowledge about functional categories to the learners of French tested here.

described in purely syntactic terms. In addition, investigating French also allows for the control of a possible confound in the German experiment that has not been mentioned so far, namely, the possible influence of the frequency of input strings on processing cost. It is well established that the frequency of a certain structure is one of the many factors that can influence how easy it is to process that structure (see Ellis, 2002, for an overview of frequency effects in language processing and their implications for theories of second language acquisition). Learners might process a grammatical structure faster than an ungrammatical structure just because it is more frequent in the input. This should in principle favor postverbal over preverbal negation, as this is the grammatical pattern in main clauses in both target languages. However, in German, the finite verb follows the negator in subordinate clauses. It cannot be excluded that this familiar pattern prevents learners from showing a reaction to the syntactic violation of a finite verb following the negator. This potential confound can be ruled out by testing the same structure in French, because in French the same word order holds in subordinate and main clauses and grammatical constructions in which a finite verb follows a negator can be assumed to be very rare. If question 2b) can be answered in the positive, this would thus rule out any explanation according to which a preference for preverbal negation might be fostered by the occurrence of negator-finite verb combinations in the input in subordinate clauses.

A final way to pit syntactic and semantic factors against each other is to compare processing preferences in lexical verb sentences to processing preferences in auxiliary sentences. As discussed above, auxiliaries might have a special syntactic status which makes it easier for learners to acquire a raised position for auxiliaries when compared to lexical verbs (Parodi, 2000). Moreover, semantically, post- and pre-auxiliary negation can be assumed to be similarly transparent, as the auxiliary, contrary to lexical verbs, does not fall into the scope of negation. If learners are sensitive to the scope of the assertion operator carried by the auxiliary, post-auxiliary negation might even be more transparent than pre-auxiliary negation. Both syntactic and semantic approaches would thus be compatible with a result similar to that of Verhagen (2009), according to which post-auxiliary negation is preferred over pre-auxiliary negation. However, crucially, only semantic approaches could also explain an absence of preferences in auxiliary sentences. From a semantic perspective, it is conceivable that the subtle semantic difference between pre- and post-auxiliary negation does not have much influence on processing cost, whereas clear preferences are expected for the (semantically heavier) lexical verbs. In this case, the results obtained by Verhagen (2009) would seem to result from the specific task used. The research question for auxiliary sentences is the following:

3) Research question for auxiliary sentences:
Is there a difference in learners' processing cost between sentences with post- as compared to pre-auxiliary negation?

If there is a difference in the sense that post-auxiliary negation is preferred over pre-auxiliary negation, this is compatible with syntactic and semantic approaches and cannot help teasing the two apart. If there is no preference, this is compatible with a semantic approach and hard to reconcile with syntactic approaches. Note that no approach predicts that pre-auxiliary negation should be easier to process than post-auxiliary negation.

In the following, more information is given about the participants tested in the current study, and about their production of negated utterances. Subsequently, more detailed predictions are derived for the three types of self-paced listening experiments separately, and the results are presented and discussed in light of the hypotheses presented in this section.

2.1 Participants

47 Turkish adult learners of German (28 female, 19 male) and 44 Turkish adult learners of French (30 female, 14 male) participated in the study. All participants were acquiring the target language in an immersion setting, having emigrated to Germany or France respectively. The learners of German had been living in Germany for eight years and ten months on average, the learners of French had been living in France for eight years and one month on average at the moment of testing. The average age was 33 years in both groups of learners. Learners had received limited language teaching prior to the time of testing (five months on average for the learners of German and ten months on average for the learners of French). The educational background of the participants was low in general. Despite the relatively long average time of residence, the participants' use of morpho-syntax clearly corresponds to a beginning stage of acquisition. Finiteness marking is unstable and except for some isolated cases, there are no complex syntactic structures such as subordinate clauses in the data. More information about the learners can be found in appendix A. 32 native speakers of German (13 male and 19 female, average age 29 years) and 24 native speakers of French (7 male and 17 female, average age 31 years) were tested as control groups.

Participants' production

In order to interpret the outcome of the processing task, it is important to have an idea of what would be the syntactic knowledge that current theories would attribute to the tested learners. Even though, as made clear above, any state of the performance in learners' production can still lead to a variety of interpretations with respect to the underlying

syntactic competence, this will help to narrow down the possible interpretations of the data. In order to test learners' production of utterances similar to those that were used in the processing task, data were collected from each learner in retellings of a short silent movie developed by Dimroth (The finite story, Dimroth, 2005) and three short picture stories developed by Verhagen (2005). The elicitation tools prompted the use of utterances in third person singular contexts (as in the stimuli sentences presented below) and provided several contexts for eliciting negated utterances. After the exclusion of unclear cases (see below), these materials elicited on average 49 utterances in third person singular contexts per learner of the present sample, of which an average of 3.2 utterances per learner were negated utterances.[22] All verb-containing utterances in third person singular contexts were selected from the transcriptions of the retellings. Self-repetitions and imitations of the researchers' utterances were excluded, as well as isolated occurrences of (presumably unanalyzed) past tense forms, subordinate clauses, and unclear syntactic structures resulting from restarts and reformulations. Also excluded were utterances in French in which it could not be decided whether the main verb was a lexical verb only or whether there was a combination of a light verb and a lexical verb.[23] Modal verbs, auxiliaries, possessive 'have' and the copulae 'to be' (*sein/être*) and 'to become' (*werden*) were coded as light verbs (following Parodi, 2000). Light verbs and lexical verbs were coded as finite when they appeared in the correct third person singular form, as non-finite when they appeared in the infinitive or past participle form and as other forms when learners used a finite form that was however not the correct third person singular form.[24] Past participle forms were not

[22] For four learners of German and three learners of French, less production data were obtained than for the rest of the learners, so that the counts for these learners are based on a smaller number of utterances (see appendix A for more details).

[23] This happened frequently when learners produced elements preceding lexical verbs that resembled clitic object pronouns, as these elements can be ambiguous between a pronoun and a combination of a pronoun and a light verb. These object pronoun-like elements also occurred frequently in contexts in which there was clearly no referent for an object. The problem of ambiguity occurred in particular because not all learners distinguished the pronunciation of the vowel in the third person singular form of the light verb 'to be', *est* (/ɛ/ in standard French) from the schwa sound in object and reflexive pronouns *le* and *se*. As a consequence, an utterance such as *Monsieur le dort* was considered to be ambiguous between *Monsieur le dort* ('Mister him sleeps') and *Monsier l'est dort* ('Mister him is sleeps'). For the same reason, utterances containing the sequence *ne pas* as in *il ne pas entendu* were also excluded because they were considered to be ambiguous between *il ne pas entendu* ('He not heart') and *il n'est pas entendu* ('he is not heart'). As the use of the negative particle *ne* was very scarce in the data, only seven negated utterances had to be excluded for this reason.

[24] In French, the finite form is sometimes homophonous with the past participle. In these cases, the forms in question were treated as the form that would be grammatical in the given context. Note that this ambiguity never occurred in negated contexts. For German lexical verbs, the presence of the -/t/ suffix was considered a sufficient agreement marker, changes of the stem which are sometimes necessary for forming correct agreement were not taken into account. Third person singular forms of 'to be', *ist*, on which the final consonant was reduced (leading to the form *is*) were coded as finite and correctly agreeing, as the resulting form is not homophonous with the bare stem. Furthermore, overgeneralizations of the -/t/ morpheme to modal verbs (leading for instance to *willt* instead of *will*) were also counted as finite and correctly agreeing verb forms. Finally, verbs appearing as bare stems were counted as finite, but non-agreeing forms in third person singular contexts (and therefore discarded from further analyses). This was done on the grounds that in first person singular contexts, the schwa-ending can be omitted,

counted separately from infinitives because the two are often homophonous in French. The placement of verbs was assessed in all negated utterances in which the main verb was either a finite light verb, a non-finite lexical verb or a finite lexical verb, finiteness meaning that the verb correctly agreed with the subject.[25] Table 1 shows the placement of the different kinds of verbs with respect to the negator for all learners of German and French respectively.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
Light verbs +fin	42	0	73	1
Lexical verbs -fin	3	57	6	11
Lexical verbs +fin	15	7	32	7

Table 1: Order of verb and negator for different kinds of verb forms in German and French

These data show first of all a clear influence of the type of verb (light vs. lexical). In both languages, learners very consistently place light verbs in a raised position, while still using unraised structures for lexical verbs. From a syntactic perspective, the data for light verbs suggest that learners can project a syntactic structure including verbal functional categories, although these might be restricted to light verbs (Parodi, 2000). From a semantic perspective, many of the tested learners —at least of German— might be at the second stage as described by Becker (2005), during which a raised position is used for light verbs for scope marking reasons, but this structure is not yet acquired for lexical verbs. The data for lexical verbs show that learners of both languages use both raised and unraised structures with these verbs. This speaks for some kind of optionality: Learners might either sometimes produce a native-like syntactic structure leading to verbs appearing in a raised position and sometimes a truncated structure leading to verbs appearing in an unraised position (Prévost and White, 1999; Vainikka and Young-Scholten, 1996a, 1996b), or always produce a full structure in which verb raising is optional (Beck, 1998; Eubank, 1993/94, 1996). It is striking that there is a clear difference in preferences between the two target languages in this respect. Whereas learners of German mainly produce unraised structures, learners of French mainly produce raised structures. Finally, there is a contingency between finiteness marking on lexical verbs and their position with respect to the negator. In syntactic terms, this can be interpreted as evidence that functional categories

leading to the bare stem being used as finite form. Note that another plausible explanation for the occurrence of bare stems are phonetic reductions of final -/t/.

[25] Regarding other kinds of verbs, there was one appearance of a non-finite light verb in German that was placed after the negator and two non-agreeing finite light verbs in French that were placed before the negator. There were also some finite, but non-agreeing lexical verb forms: 25 in German, 20 of which appeared with preverbal negation, and 2 in French which both appeared with postverbal negation.

are native-like, leading to raising for finite and absence of raising for non-finite verbs (as suggested by Prévost and White, 2000, and by Vainikka and Young-Scholten 1996a, 1996b at least for a certain period of development). From a semantic perspective, it seems that learners are sensitive to the scope-bearing properties of finiteness and treat finite verbs differently from non-finite ones.

To sum up, the production results confirm the observations summarized in section 1.2: Whereas light verbs are consistently placed in a raised position, lexical verbs can appear in both positions.[26] This leaves open all possible assumptions concerning the grammatical knowledge in early learners and the nature of the constraints that govern utterance structure, presented above. As shown in the preceding section, processing data might provide evidence that could help in the teasing apart of syntactic and semantic influences and estimating their relative weight. In the following, the materials, predictions, procedure and results are discussed separately for the three types of experiments introduced above.

2.2 Lexical verbs in German

The first experiment investigates the processing of lexical verbs in German in order to find out whether there is a preference for pre- over postverbal negation, independent of finiteness marking on the verb. More detailed predictions are derived in the next section.

2.2.1 Materials and predictions

The materials that were constructed for the first experiment were similar to those used by Verhagen (2009), with the difference that singular subjects were used in the present experiment. As, contrary to plural forms, finite forms in the singular are not homophonous with the infinitive, this allows testing the processing of verbs that are clearly marked or unmarked for finiteness. There were 16 simple third person singular present tense declarative sentences (for a list of all materials, see appendix C1) which contained lexical main verbs. All of these verbs ended in *-en* in the infinitive, and in *-t* in third person singular present tense contexts. Sentences appeared in four conditions, illustrated below. In order to make the predictions that can be derived based on syntactic and semantic factors clearer, sentences that are ungrammatical (in the native grammar) are marked with *, and the scope relations assumed to hold in these sentences are indicated as well. Note that the indicated scope is the scope of negation in the most frequent case, in which negation takes

[26] One important question concerning these data is whether there are subgroups in the learner groups who behave differently from each other. To investigate this question, a proficiency split was performed for learners of both groups according to the rate of correct agreement (see chapter 3 for the same split). All self-paced listening results reported in the current chapter split up for the two proficiency groups can be found in appendix D3. It becomes evident there that the pattern of results is in most cases similar for learners at both proficiency levels. For this reason, the collapsed results for both levels are presented in the text.

scope over the whole verb phrase, and also the most frequent scope of assertion over the whole negated phrase. As discussed below, these need not correspond to the interpretation of participants in the experiment.

(1.1) *fin + neg*: Der Junge ($_{ast}$ ($_{neg}$ schreibt nicht an seine traurige Tante)).
the boy writes not to his sad aunt

(1.2) *inf + neg*: *Der Junge ($_{neg}$ schreiben nicht an die[27] traurige Tante).

(1.3) *neg + fin*: *Der Junge ($_{ast}$ nicht ($_{neg}$ schreibt an seine traurige Tante)).

(1.4) *inf + neg*: *Der Junge nicht ($_{neg}$ schreiben an die traurige Tante).

Note that in the unraised sentences, the PP, which normally would precede the verb if the verb is not raised out of the VP, follows the verb. In addition, the presence of the PP makes it more complicated to determine the scope of the negator, as it could have scope only over this PP. However, it is important to have a segment following the critical verb-negator complex where delayed effects would be visible since several studies have found that comprehenders (especially L2 learners) show delayed effects in particular on the last segment of the sentence (Hopp, 2006; Juffs and Harrington, 1995, 1996).[28]

For native speakers, it can be assumed that all four sentences should be semantically relatively transparent. In the syntactically deviant preverbally negated sentences of type (1.3) and (1.4), the negator precedes an element that is very plausibly in its semantic scope, namely, the VP. On semantic grounds, the computation of the scope of negation should be straightforward in this case, even though, as discussed below, processing of these sentence types might be hindered by the ungrammatical word order. In postverbally negated sentences of type (1.1) and (1.2), a plausible semantic scope can be computed easily if participants consider the possibility that the verb might be in the scope of the negator although it precedes this element. It can be assumed that this is the case for

[27] In the last noun phrase, the determiner or the adjective was sometimes different in the finite and non-finite condition. This was done in cases in which non-finite verbs were longer than their finite counterparts, in order to maintain an equal number of syllables across conditions. While this might not be ideal, note that the two finite sentences ((1.1) and (1.3)) and the two non-finite ones ((1.2) and (1.4)) always contained identical lexical items. If the changes in the last noun phrase had any effect, it should appear in a difference between finite and non-finite sentences, and can only appear on the last segment of the sentence. As will become clear during the discussion of the results, there is no indication in the data that such an effect existed.

[28] In addition, it is well established that independent of late effects, there are often sentence-wrap-up effects on the last segment, such that processing times are generally higher on this segment (Felser et al., 2003; Juffs and Harrington, 1996; Roberts and Felser, submitted). It therefore seems unwise to stop the sentence or introduce a clause-break directly after the critical verb-negator segment. This could lead to effects of the critical segment, delayed effects and sentence-wrap-up effects to all come together on this segment, and to possibly mask each other. The risk of keeping the PP is that participants might not show a preference for unraised structures that they may have otherwise shown, because the order of the verb and the PP does not correspond to their expectations. As will become clear in the results section, there was a preference for unraised structures in the learners, so that it can be excluded that such a preference could have been masked by this potential artifact.

native speakers. Native speakers should thus have no difficulties in constructing a *semantically* plausible representation of the sentences, and there should be no processing delays for semantic reasons. In contrast, it can be assumed that native participants will have difficulties in constructing a *syntactic* representation of sentences of the type (1.2), (1.3) and (1.4). Based on the results by Pearlmutter et al. (1999), it is assumed that in sentences of type (1.2), the verb form will be processed more slowly than in (1.1), as it does not agree correctly with the subject. In sentences of type (1.3) and (1.4), it is assumed that participants will have problems in building a syntactic representation of the sentences as soon as they encounter the negator in second position, which violates the syntactic rule that prescribes a verb to appear in second position in German main clauses. Summing up, the following prediction can be derived for native speakers:

- Native speakers should be delayed in the processing of sentences (1.2), (1.3) and (1.4) relative to (1.1), as these sentences should lead to problems in the construction of a well-formed *syntactic* representation of the sentence.

For learners, it is less clear whether syntactic or semantic principles are mainly of influence at this stage of development. Let us assume first that learners are mainly influenced by semantic principles in their processing. In this case, processing cost should be determined by how easy it is for learners to compute the semantic scope of negation. If, in the absence of a syntactic principle in their grammar helping them to determine the scope, participants rely on the cross-linguistically valid semantic principle that operators precede their scope (see section 1.2), this would lead to the straightforward interpretation that the whole VP is in the scope of the negator in preverbally negated sentences of type (1.3) and (1.4), and this interpretation is plausible. In contrast, in the postverbally negated sentences (1.1) and (1.2), the same assumption should lead to problems in processing the sentence. Participants could adhere to a strict scope-to-the-right principle and come to the conclusion that only the PP is in the scope of the negator in sentences with preverbal negation. This conclusion is however not very plausible in sentences that are, as is the case in the present experiment, presented out of context, and this implausibility might lead to a delay in processing. It could also be that learners try to determine a more plausible scope of the negator in postverbally negated sentences. This would force them upon encountering the negator to go back and consider that the verb that they have heard before might be in the semantic scope of this element.[29] To sum up, the following prediction can be made if one assumes that the

[29] This discussion does not take into account that learners might be sensitive not only to the scope of negation, but also perhaps to the scope-bearing properties of finiteness. One might then wonder whether sentence (1.3) would be harder to process than sentence (1.4), also on purely semantic grounds. This does not seem very likely, as it would mean that learners would be disturbed in (1.3) by the fact that the negator in itself is not transparently in the scope

learners' processing of these utterances is driven more by semantic than syntactic procedures:

- If the L2 learners' processing of these utterances is driven more by semantic than syntactic procedures, then (1.3) and (1.4) will be easier to process than (1.1) and (1.2).

If, in contrast, one assumes that *syntactic* constraints have a strong weight at this stage of development, learners should process those sentences with the greatest ease that correspond to their syntactic representations of the target language. This leaves several possibilities open, depending on how this knowledge is assumed to be structured. In particular, each of the following three outcomes is compatible with at least one syntactic approach:

- If L2 learners' grammar shows optionality between a full native-like representation and truncated structures (cf. Prévost and White, 1999 and cf. Vainikka and Young-Scholten, 1996a for learners having access to raised structures), then utterances (1.1) and (1.4) are predicted to be equally unproblematic to process, as they correspond to these two structures. In contrast, the processing of structure (1.3) should be delayed relative to these two sentences, as a finite verb cannot be reconciled with a truncated structure.[30]
- If L2 learners' grammars are characterized by optionality due to non-native-like syntactic representations, then there should be no difference in the processing of the four utterance types (Beck, 1998; Eubank; 1993/94; Meisel, 1997).
- If the tested learners can only project a VP and are not yet sensitive to finiteness marking, sentences of type (1.3) and (1.4) should be easier to process than sentences of type (1.1) and (1.2) (cf. Vainikka and Young-Scholten, 1996a, 1996b for beginning learners).

According to one type of syntactic approach (in particular, Prévost and White, 1999, 2000), sentences of type (1.1) and (1.4) should thus be easier to process than sentences of type (1.3)[31], whereas another type of syntactic approach (Beck, 1998; Eubank, 1993/94; Meisel,

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of finiteness. Given the subtle difference between a negated assertion (which is (1.3) according to the surface scope) and an asserted negation, it seems unlikely that this leads to any processing cost on semantic grounds.

[30] This prediction is clearly made by Prévost and White (1999, 2000). Vainikka and Young-Scholten (1996a, 1996b) do not make a similar clear prediction about the acceptability of finite verbs in unraised positions. As they assume a stage of optional raising, this configuration might be acceptable for a certain stage according to their model. However, if this is the case, this should lead to all four utterances being compatible with the learner grammar, and thus fall together with the approaches assuming optionality due to non-native-like syntactic representations.

[31] Note that no clear predictions can be derived for the processing of sentences of type (1.2) from these approaches. If the learners' grammar allows for a non-finite verb to substitute a finite verb (cf. Prévost and White,

1997) predicts equal processing cost for all four types of sentences. If one of these two predictions is borne out, this would thus be clear evidence for syntactic approaches to early learner language. The last prediction, which is derived from the description that Vainikka and Young-Scholten (1996a, 1996b) have made of very early learner grammar, is identical to the predictions of semantic approaches. If this prediction is borne out, this would thus be compatible with semantic as well as with one type of syntactic approaches. However, the syntactic approach could then only explain the data by assuming that the tested learners are in a stage of development in which they can only project a VP. This point is discussed in more detail below.

2.2.2 Procedure

The 16 experimental sentences of the present experiment were intermixed with 8 other experimental sentences from the auxiliary experiment presented below. There were also 24 simple declarative present tense filler sentences. Two thirds of the filler sentences were grammatical and one third contained word order and agreement errors, so that overall, 50% of all sentences appearing in the experiment were grammatical. The filler sentences contained no negator. Across all materials, no lexical item occurred more than twice. Items were recorded by a female native speaker of German. The speaker was instructed to read the sentences in a natural way, but very slowly. This reduced co-articulation and reduction effects which are proper to spontaneous speech at a normal or fast speaking rate, and sentences could thus be cut into segments without short segments being incomprehensible. Particular care was taken to ensure that all verb endings were clearly audible. Moreover, a similar intonation contour was adapted across conditions, in which no item received any emphatic accent (which might lead to a reading in which the negator has scope over that specific item). Sentences were then cut into segments comprising the subject, the verb, the negator, the preposition and the final object noun phrase respectively. Four experimental lists were created, such that each item appeared in a different one of the four conditions in each list. A given participant was always presented with all the items from one single list, so that each participant heard one version of each item only. The same randomized order was used in each list. To control for effects of order, reverse lists were used for half of the participants in which the second half of the original list was presented first.

Participants sat in front of a laptop and heard the prerecorded segments via headphones. After listening to each segment, participants were asked to press a button on a dual push-button box to receive the next segment. If a participant pressed the button before

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1999, 2000), or for an underspecified functional category (Vainikka and Young-Scholten, 1996a, 1996b), sentences of type (1.2) should be equally easy to process as sentences of type (1.1). However, these authors would probably not exclude that learners might prefer a fully specified finite verb over a default verb in raised positions. Whether there is a difference in processing ease between sentence (1.2) and (1.1) or not cannot help to distinguish between syntactic and semantic accounts, so this question is left open.

the end of a segment, the segment was truncated at the point of the button press in order to discourage participants from pressing the button before they had heard and processed each segment. The computer recorded the time between the onset of each segment and the next button press. The end of each sentence was indicated by a tone. The presentation of the stimuli and the recording of reaction times were controlled by the NESU software package (Baumann et al., 1993). To ensure that participants processed the stimuli sentences for comprehension, all sentences were followed by a question concerning the content of the sentence. The comprehension question for the item given above was *Schreibt der Junge an seine/die Tante?* ("Does the boy write to his/the aunt?"). The participants had to answer this question by pressing one of two buttons, a green button labeled 'yes' or a red button labeled 'no'. Since the experimental items were all negative, the correct answer to all experimental items was 'no', and this was counterbalanced by having the correct answer to most of the filler items (all but 4) 'yes'.[32] The experiment lasted approximately 20 minutes and was divided into two 10-minute sessions by a short break. Before the first session started, participants performed a warm-up session in which 10 additional filler items were presented and participants could familiarize themselves with the procedure. After the warm-up session, the experiment stopped and participants could ask questions if they had any. The first experimental session then started with two additional warm-up sentences as did the second session after the break.

2.2.3 Results

In the experimental trials, accuracy on the comprehension questions reached 83% on average for the native speakers and 46% on average for the learners. Note that although the accuracy of the learners was around 50% of correct answers, this does not mean that their performance was random. The learners had a strong 'yes'-bias, such that the accuracy was much lower on questions requiring 'no' as an answer (52% correct answers throughout all 'no'-questions in the experiment), as was the case for all experimental trials, than for questions requiring 'yes' as an answer (78% correct answers throughout all 'yes'-questions in the experiment). The difference between these two types of questions shows that learners processed the sentences for comprehension and did not answer randomly. They relatively reliably answered 'yes' to questions requiring 'yes' at an answer, but succeeded in answering 'no' to questions requiring 'no' in around 50% of the cases only. As it would have been impossible to perform analyses on the dramatically reduced data set of only the correct trials, all trials were taken into account in the following (the same decision has been taken

[32] While it would have been desirable to have the yes/no answers balanced within the experimental items, this was impossible to achieve with negated sentences. A question to a negated sentence that can be answered with 'yes' either needs to be negated itself, or to concern a part of the sentence that is not in the semantic scope of the negator. It seemed that both possibilities would have focused participants' attention too much on negation and its scope-bearing properties, thereby possibly influencing the way participants would process the sentences.

in previous self-paced reading studies, e.g. Hopp, 2006, and Jiang, 2002 for non-native comprehenders, and Trueswell, 1996 and Weyerts et al., 2002 for native comprehenders). Listening times were measured separately on the subject, the verb, the negator, the preposition following the negator and the object. Reaction times to segments in which participants pressed the button before the end of the segment or took more than 4 seconds to press the button after the segment had ended were removed from further analysis. As the verb and the negator changed position in the sentence in the different conditions the results for the verb and the negator-regions are collapsed in the following analyses. To control for the influence of the duration of segments as well as for differences in the average reaction latencies between participants, a linear regression was computed for every participant in which the raw reaction times on all segments (of both fillers and experimental items), were predicted from the duration of these segments (Ferreira and Clifton, 1986; Trueswell et al., 1994). Residual listening times were computed by subtracting the predicted reaction time from the observed raw reaction time for each segment. The residual listening times were cleaned so that listening times above or below 2 standard deviations (sd) from the mean for each segment were excluded from further analysis. Two native German subjects were excluded because this procedure led to incomplete data sets (for the remaining participants, 6.3% of the data of the native speakers and 5.5% of the data for the learners were removed by the cleaning procedures). The raw reaction times measured from the onset of all segments as well as corrected reaction times measured from the offset of all segments are reported in appendix D1. These results are very similar to those presented below (see also Booth et al., 2000, who also found comparable results for residual and raw listening times).

Native speakers

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for the German native speakers are summarized in Table 2 and Figure 3.

	Subject (Der Junge)	**Verb/negator (schreibt nicht)**	**Preposition (an)**	**Object (seine Tante)**
1: fin + neg	-28 (243)	-314 (252)	198 (167)	143 (372)
2: inf + neg	-63 (227)	-199 (253)	193 (188)	164 (314)
3: neg + fin	-66 (277)	-309 (273)	205 (206)	168 (339)
4: neg + inf	-37 (247)	-291 (255)	157 (200)	135 (348)

Table 2: Mean residual listening times (sd) for the different segments for native speakers of German

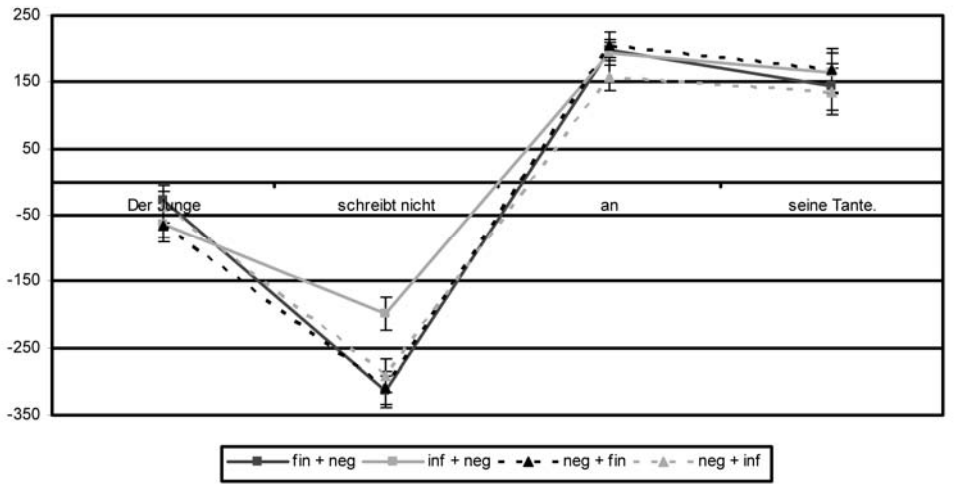


Figure 3: Mean residual listening times per condition and segment in the native speakers of German (error bars represent standard errors)

The collapsed listening times on the verb and the negator as well as the listening times on the preposition and the object were analyzed with separate repeated measures analyses of variance with negation (post- vs. preverbal) and verb form (finite vs. non-finite) as within-subjects factors.

The listening times on the verb and negator complex revealed a main effect of negation which was significant only in the subject analysis, but not in the item analysis ($F1(1,29) = 5.55$, $p < 0.05$; $F2(1,15) = 2.6$, ns). There was also a main effect of verb form which was marginally significant in the subject analysis and significant in the item analysis ($F1(1,29) = 3.91$, $p = 0.058$; $F2(1,15) = 5.34$, $p < 0.05$). These two effects indicate that postverbally negated sentences led to slower listening times than preverbally negated sentences, and non-finite verb forms to slower listening times than finite verb forms. Although the interaction between negation and verb form was only marginally significant ($F1(1,29) = 3.81$, $p < 0.1$; $F2(1,15) = 3.05$, $p = 0.1$), it is clear from the pattern of results that these effects are due to slower listening times to non-finite verbs in postverbally negated sentences, as compared to the three other conditions. Indeed, there was a significant difference between the listening times to finite and non-finite verbs forms in postverbally negated sentences ($t1(29) = 2.66$, $p < 0.05$, $t2(15) = 2.38$, $p < 0.05$), whereas there was no difference in listening times between the two verb forms in preverbally negated sentences ($t1(29) = 0.06$, ns, $t2(15) = 0.51$, ns). There were no significant differences between the listening times to the preposition (all $Fs < 2$) or the object (all $Fs < 1$).

Learners

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for the learners of German are summarized in Table 3 and Figure 4.

	Subject (Der Junge)	**Verb/negator (schreibt nicht)**	**Preposition (an)**	**Object (seine Tante)**
1: fin + neg	-84 (329)	-341 (420)	201 (258)	75 (503)
2: inf + neg	-150 (353)	-348 (429)	178 (248)	76 (481)
3: neg + fin	-127 (336)	-387 (227)	120 (227)	121 (502)
4: neg + inf	-118 (327)	-319 (232)	97 (232)	12 (454)

Table 3: Mean residual listening times (sd) for the different segments for Turkish learners of German

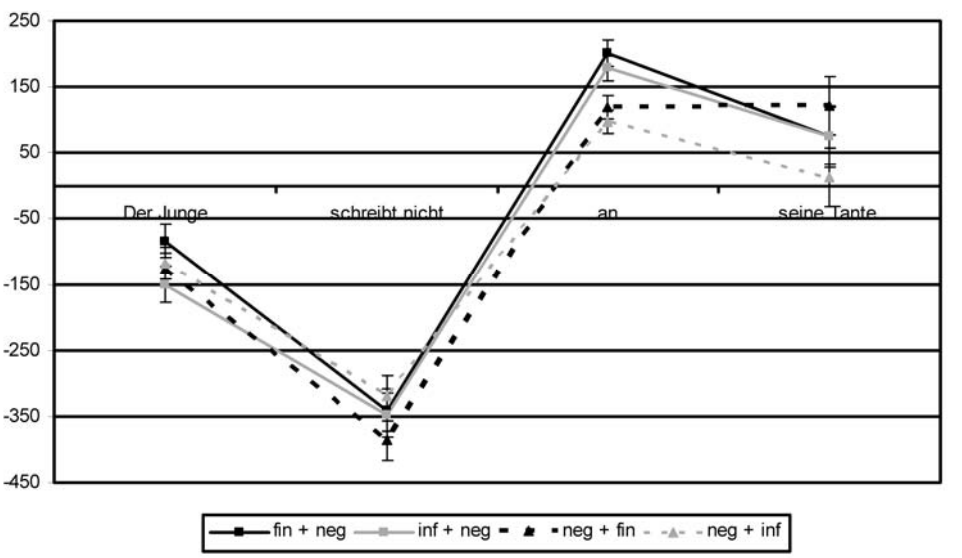


Figure 4: Mean residual listening times per condition and segment for Turkish learners of German (error bars represent standard errors)

There were no significant effects on the verb and negator (all Fs < 1.4). On the preposition, there was a main effect of negation: In preverbally negated sentences, the preposition was processed faster than in postverbally negated sentences ($F1(1,46) = 25.96$, $p < 0.001$; $F2(1,15) = 10.45$, $p < 0.01$). In addition, there was a tendency to process the preposition faster after non-finite than after finite verbs, but this effect did not reach significance ($F1(1,46) = 1.77$, ns; $F2(1,15) = 1.83$, ns). There was no interaction between the two factors (both Fs < 1). There was no clear pattern of results on the object: There was no significant effect of negation ($F1,2 < 1$), and for verb form, there was a preference for non-finite over

finite verbs which was significant in the subject analysis only ($F1(1,46) = 5.37$, $p < 0.05$. $F2(1,15) = 1.72$, ns). This must be due to the preverbally negated sentences, as sentences with postverbal negation led to almost the same listening times on the object independent of the verb form. There was, indeed, a marginally significant interaction between the two factors in the subject, but not in the item analysis ($F1(1,46) = 3.7$, $p < 0.1$, $F2(1,15) = 2.15$, ns).

2.2.4 Discussion

The results for the native speakers show weak tendencies on the verb-negator complex which are only partially in line with the prediction derived above.[33] The observed differences are due to the fact that there were slower listening times to the verb-negator complex for sentences of type (1.2) than for the three other sentence types.

This tendency is most likely due to the same *syntactic* mechanism as observed by Pearlmutter et al. (1999). Participants are hindered in their processing by encountering an unexpected verb form in sentences of type (1.2) when compared to sentence (1.1), in which a finite and agreeing verb form is encountered in second position.[34] Note that there was no difference in the listening times to finite and non-finite verbs when these verbs appeared in an unraised position, indicating that participants differentiated between raised and unraised structures. However, unexpectedly, there was no overall grammaticality effect for word order. Ungrammatical preverbally negated sentences were not processed more slowly than grammatical postverbally negated sentences. A similar absence of grammaticality effects in native speakers has been found in other studies on L2 acquisition (Eubank, 1993; Roberts and Felser, submitted). Often, the materials that are constructed in acquisition studies are very simple in order for learners to be able to understand them. This might lead to the problem that the stimuli are too simple for native speakers, so that they have so many free processing resources that they can detect and correct anomalies online without any measurable effect.[35] This does however not harm the investigation of the present research

[33] In addition, the data also show that different segments of the stimuli sentences were processed with different ease, and this effect of segment is relatively large in the present study. This might be due to the use of auditory stimuli in comparison to written stimuli in most studies. It might be harder to process a relatively short auditory segment which people normally do not hear in isolation, as compared to process a written word in isolation. This effect might be augmented by the fact that the length of the different segments in the present experiments was quite variable and therefore unpredictable. The differences between segments remain the same across conditions and can therefore not influence the experimental manipulation. They are therefore not further discussed.

[34] Note that it cannot be decided on the basis of these data whether the verb form was perceived as a non-agreeing finite verb form or as an infinitival form, given that the two are homophonous in German. This will be discussed when the results of the French experiment are presented.

[35] This explanation is supported by the fact that Eubank (1993) found a grammaticality effect in a second group of native speakers that he presented with the same type of sentences, but with an additional center-embedded relative clause. The relative clause did not influence the grammaticality, but made the sentence more complex and thereby provoked an effect of the ungrammaticality that in more simple sentences did not provoke any effect. Similarly, whereas Roberts and Felser (submitted) did not find an effect in their native speaker control group, Pickering and

question. What is important for the present question is less whether any potential point of difficulty does indeed slow down native speakers, but whether, if there is a slow-down, it can be attributed to syntactic or to semantic causes. The only effect that could be found in native speakers can clearly be attributed to a *syntactic* process caused by encountering a non-agreeing verb.

For the learners, the pattern is very different. There was a clear main effect of preverbal negation which appears on the preposition, in the sense that the preposition is processed faster after pre- than after postverbal negation. On the object, there is a less clear tendency to process sentences of type (1.1), (1.2) and (1.3) more slowly than sentences of type (1.4), showing a preference for unraised verbs in unraised positions over the three other sentence types.[36]

The preference for pre- over postverbal negation cannot be reconciled with the approaches advocated by Prévost and White (1999, 2000), Beck (1998), Eubank (1993/94) or Meisel (1997). All these approaches predict that learners should either process all four sentence types with comparable ease, or that they should show a preference for both the grammatical sentence type (1.1) and the truncated structure in sentence (1.4) over the sentences of type (1.3). The fact that both sentences of type (1.3) and (1.4) were processed with more ease than sentences of type (1.1) cannot be explained by these accounts.

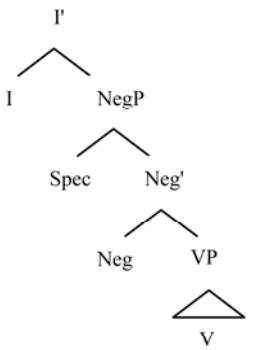
Traxler (1998) found an effect with very similar, but slightly more complex sentences in native speakers. Other explanations are possible for the absence of a grammaticality effect for the word order variation. In particular, one possible explanation is that semantic scope marking also influences processing cost in native speakers. It might be that there are two different effects pulling in different directions. On the one hand, encountering a negator before the verb might lead to a syntactically determined processing cost because this element is not easy to integrate into the phrase structure. The expected element at this position is a finite verb, and the parser either has to leave the place for the finite verb in the CP unfilled or project a different (ungrammatical) structure to find a position for the negator. Both processes are presumably associated with processing costs. No such costs are expected in sentences with postverbal negation, in which a grammatical phrase structure can be built incrementally. However, it might be that postverbally placed negators are processed more slowly than preverbally placed negators, maybe because participants have to reactivate the preceding verb in order to find the semantic scope of the negator. These two effects could then level each other out, leading to no difference in the processing times between raised and unraised structures with negation. This is a possibility which can neither be excluded nor supported on the basis of the present data. It can thus only be concluded that there is no clear evidence for any semantic effect, whereas, as discussed in the text, there is evidence for a syntactic effect. Note also that a semantic interpretation for the absence of a word order effect for native speakers of German is hard to reconcile with the data for the French native speakers, who showed a grammaticality effect for word order. Based on this finding, the idea presented in the text according to which participants might be able to 'correct' the ungrammatical word order will be discussed in more detail in the discussion of the French data.

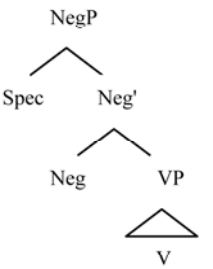
[36] The weak interaction effect on the object indicates that if there is an unraised structure, it is even easier to process if the verb is non-finite than if the verb is finite. This observation does not allow to discriminate between different accounts. It might be due to the higher frequency of non-finite verbs following the negator as compared to finite verbs in this position. It might also be a syntactically determined penalty for finite verbs in the VP, or a semantically-based tendency to preferring an assertion-marked element to appear earlier in the sentence. These possibilities will not be further discussed, as this does not contribute to deciding between different accounts. What is important is not that sentences of type (1.4) might be even easier to process than sentences of type (1.3), but that both types of sentences are easier to process than sentences of type (1.1) and (1.2).

Two possible explanations remain. Either the preference for unraised over raised structures is due to the greater *semantic* transparency of these structures, or it is evidence for a *syntactically*-based learner grammar in which only a VP can be projected. Both explanations are compatible with the fact that the effect appears on the preposition. If the preference is syntactically determined, a problem should arise on the postverbal negator which cannot be smoothly integrated into a VP-structure. However, it is conceivable that the effect of this problem is visible one segment later, thus on the preposition. If the preference is semantically determined, it seems plausible that the difficulty of postverbal negation is detected on the negator or shortly thereafter, when participants might realize that there is material following the negator and they have to decide whether this material or the verb preceding the negator should be assumed to be in its semantic scope.

The syntactic and the semantic explanation differ in how well they can account for the production data from the same learners presented above. The syntactic approach can only explain the data when assuming that the tested participants can only project a VP, and no higher functional projections. If participants can at least sometimes also produce more complex structures, there is no reason why they should not use these structures for processing grammatical sentences of type (1.1). As shown above, the learners of German sometimes produced raised structures. In order to maintain a syntactic approach, one would have to assume that either the learners who produced these raised structures form a sub-group of the tested group who did not influence the processing results, or that all these structures are rote-learnt chunks and do not provide evidence for grammatical knowledge. Even though these two assumptions could be true, they make a syntactic explanation less parsimonious than a semantic explanation. In particular, a semantic account is not in conflict with the observation that learners can produce raised structures. It is conceivable that learners start building up syntactic knowledge which will pave the way to a more native-like grammar in which the weight of syntactic constraints is high, but that semantic knowledge still dominates a large part of the production and the processing of the tested learners.

To sum up the discussion and the open questions, consider the three possible states of learners syntactic knowledge represented in Figures 5 through 7 (Figure 5 represents a full phrase structure, of which only the relevant part below the IP is shown here).





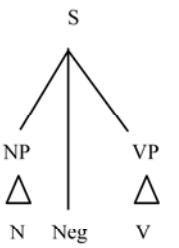


Figure 5: Native-like structure *Figure 6: Truncated structure* *Figure 7: Adjunct-based structure*

There is no evidence that learners use a native-like syntactic structure of the type depicted in Figure 5 for processing the stimuli sentences. Figure 6 represents the state of a learners' grammar which can only project a VP. If the constraints valid in this structure govern learners' processing, why learners prefer unraised over raised structures can be explained, but this result is difficult to reconcile with the production preferences of the same learners. Finally, Figure 7 represents the state of the learner grammar as assumed by Dimroth et al. (2003) and Becker (2005) for early learners: Syntactically, all phrases are adjuncts. The order of elements is not determined syntactically, but semantically. It is assumed that the negator precedes the VP because the VP is in the semantic scope of the negator. Assuming that this semantic constraint governs learners' perception of the stimuli sentences can explain why learners prefer unraised over raised structures. Note also, as already indicated above, that there is no need on this account to assume that learners could never project more complex structures as the ones indicated in Figures 5 and 6. The learner varieties approach assumes that there is a slow transition between different phases, in which the weight of different types of information changes (see Klein and Perdue, 1992). The present results are compatible with the assumption that the semantic principle of transparent scope marking has a strong influence on learners' processing, while not excluding that learners also have more complex syntactic knowledge, which does however not yet dominate the processing cost to the degree observed in native speakers.

All in all, it can be concluded that, at the level of proficiency investigated here, learners' processing preferences can be explained in the most parsimonious way by assuming that processing cost is determined by semantic principles, but that a syntactic explanation cannot be completely ruled out. In the following two experiments, by replicating the experiment in French, more conclusive evidence is sought.

2.3 Lexical verbs in French

Replicating the experiment in French poses the problem of having to choose from different possible verb types in French in order to construct the experimental materials. Learners of French have been shown to make productive use of verb morphology first for verbs ending in *-er* (Becker and Veenstra, 2003; Klein and Perdue, 1992; Noyau, Houdaïfa, Vasseur and Véronique, 1995). As morphology is an important factor for the current design, this speaks in favor of using this verb type in the experiment. However, the infinitival form of verbs ending in *-er* is homophonous to the second person plural present tense form. There is thus again an ambiguity for the non-finite form, in the sense that this form could either be the truly infinitival form, or an agreement error. This problem could be avoided by using verbs ending in *-ir, -oir* or *-re*, in which the infinitival form is unambiguously infinitival. For native speakers, this seems to be the more interesting verb type to use. In particular, this would make it possible to find out whether the reaction of the native speakers to the form ending in *-en* in German was the reaction to an agreement error, or whether a similar reaction can be elicited by a clearly non-finite verb. However, it might be that learners have less knowledge of the verb morphology of this type of verbs in French. For these reasons, it was decided to run two versions of the experiment in French, one with verbs ending in *-er* (also referred to as 'regular verbs' in the following) and one with verbs ending in *-ir*, *-oir* or *-re* (also referred to as 'irregular verbs'). The materials were constructed so as to be as similar to each other as possible, and participants completed the two versions of the experiment either at two times relatively distant from each other on the same day, or on different days. The materials and predictions, results and discussion for both versions are presented in the following.

2.3.1 Materials and predictions

The experimental materials were constructed in exactly the same way as described above for German. There were 16 simple sentences with verbs ending in *-er*, and 16 simple sentences with verbs ending in *-ir, -oir* or *-re*. A list of all materials can be found in appendix C1. The grammaticality of the four different sentence types and the scope relations present in these sentences are the same as in German. They are illustrated once more in (2) for a verb ending in *-er* and in (3) for a verb ending in *-ir*.

(2.1) *fin + neg*: Le garçon ($_{ast}$ ($_{neg}$ mange pas dans la nouvelle cuisine)).
the boy eats not in the new kitchen

(2.2) *inf + neg*: *Le garçon ($_{neg}$ manger pas dans la vieille cuisine).

(2.3) *neg + fin*: *Le garçon ($_{ast}$ pas ($_{neg}$ mange dans la nouvelle cuisine)).

(2.4) *neg + inf* : *Le garçon pas ($_{neg}$ manger dans la vieille cuisine).

(3.1) *fin + neg*: Le policier ($_{ast}$ ($_{neg}$ écrit pas à ses chers grands-parents)).
the policeman writes not to his dear grand-parents
(3.2) *inf + neg*: *Le policier ($_{neg}$ écrire pas à ses chers grands-parents).
(3.3) *neg + fin*: *Le policier ($_{ast}$ pas ($_{neg}$ écrit à ses chers grands-parents)).
(3.4) *neg + inf*: *Le policier pas ($_{neg}$ écrire à ses chers grands-parents).

The materials correspond exactly to the German materials. Note, however, that in French, the order of the verb and the PP corresponds to the French head-initial structure of the VP in all conditions (whereas they did not match the German head-final structure in conditions 3 and 4 in the German experiment), so that there is no concern in the French experiment that any preferences for a certain structure could be masked by an unexpected order. The predictions are also very similar to those for the German experiment, except for some points discussed in more detail in the following.

For the native speakers of French, the experiment allows for a further investigation into the nature of the processing delay in sentences of type (1.2) as opposed to (1.1) in German, more precisely, whether this delay reflects the reaction to an agreement error or to an infinitival verb. If it is a reaction to an infinitival verb (or to both), the effect should be replicated in both versions of the French experiment: (2.2) should be processed more slowly than (2.1), and (3.2) more slowly than (3.1). If it is a reaction to an agreement error, it should be replicated only in the verbs ending in *-er*: (2.2) should be processed more slowly than (2.1), but there should be no difference in processing cost between (3.2) and (3.1). As the ungrammatical preverbal negation pattern did not lead to any processing delay in the native speakers of German, a comparable absence can be expected for the native speakers of French, so that no further effects are predicted.

As for the learners, it was shown above that they raised the verb over the negator much more often than the learners of German. According to all criteria usually applied in production studies, these learners have access to a native-like structure as presented in Figure 5. If these learners still show the same preference for preverbal negation as found in the learners of German, this would thus constitute strong evidence that processing cost is not determined by syntactic principles only. Moreover, this would also show that a structure can be preferred even if it is extremely rare in the input, which is something that could not be concluded based on the German data, due to the negator-verb order that obtains in subordinate clauses in German.

2.3.2 Procedure

As can be seen in appendix C1, double the number of materials were created in French as compared to German in order to create two similar versions of the experiment. There were 16 experimental sentences in each of the versions, and 24 different filler sentences in each

version. The same 8 experimental sentences of the auxiliary experiment reported below were inserted in the two versions, although only the first presentation of this experiment was analyzed for every learner. Items were recorded by a female native speaker of French. As in the German experiment, the speaker was instructed to read the sentences in a natural, but very slow way with no emphatic accent on any item.[37] Four experimental lists were created for each version of the experiment, in each of which each item appeared in a different one of the four possible conditions. A given participant was always presented with all the items from one single list, so that each participant heard one version of each item only. The same randomized order was used in each list, also in the two versions of the experiment. To control for effects of order, reverse lists were used for half of the participants in which the second half of the original list was presented first. Moreover, half of the participants received first the version of the experiment with verbs ending in *-er*, and the other half started with verbs ending in *-ir*, *-oir* or *re*. The two versions of the experiment were run on different days if possible. If that was not possible, it was ensured that participants performed a variety of other tasks in between the two versions and also took a break in between. The running of each version proceeded in exactly the same way as for the experiment in German. The warm-up session containing ten warm-up sentences was not repeated for running the second version.

2.3.3 Results

The accuracy on the comprehension questions was highly comparable to what was obtained for the speakers of German: in the experimental trials, it reached 75% on average for the native speakers and 48% on average for the learners. Again, the learners showed a strong 'yes'-bias: the accuracy was much lower on questions for which the correct answer was 'no' (51%), as was the case for all experimental trials, than for questions requiring 'yes' as an answer (74%). The difference between these two types of questions shows that learners processed the sentences for comprehension and did not answer randomly. As in the experiment in German, all trials are taken into account in the following. The rest of the

[37] The slow speaking rate led to the speaker inserting a prosodic break after the verb and negator complex. Unfortunately, due to the effect of final lengthening in French, this led to relatively large differences in duration between items in different conditions: The *pas* were longer in post- than in preverbally negated sentences (as they then preceded the break), whereas the last syllable of verb forms was longer in pre- than in postverbally negated sentences. One might wonder whether these durational differences could have influenced the results despite the transformation of the raw results to residual listening times. It might be that participants can react faster to a word in which the final syllable is lengthened than could be expected based on the duration of the word form alone, as recognition of the word has probably taken place before or early in the last syllable. However, a look at the raw reaction times for the verb and the negator separately (appendix D2) shows that the advantage for postverbally over preverbally placed negators does not only hold in the residual, but also in the raw reaction times, suggesting that it does not represent any artifact. Moreover, verbs are also reacted to faster in the post- than in the preverbally negated sentences. As the durational difference goes in the opposite direction for verbs than for the negator, one would have expected the effect to be reversed here if it was caused by durational differences between conditions.

procedure was also identical to that described above for German. The analyses described in the following report the residual listening times, the raw and corrected listening times can be found in appendix D1. The residual listening times were cleaned so that listening times further away than 2 sds from the mean for each segment were excluded from further analysis. Four subjects had to be excluded in the learners of French because this exclusion criterion resulted in incomplete data sets for these four subjects (for the remaining subjects, 6.5% of the data from the native speakers and 4.9% of the data from the learners were removed by the cleaning procedures).

Verbs ending in -er

Native speakers

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for verbs ending in *-er* for the French native speakers are summarized in Table 4 and Figure 8.

	Subject (Le garçon)	**Verb/negator (mange pas)**	**Preposition (dans)**	**Object (la cuisine)**
1: fin + neg	-102 (235)	-135 (279)	10 (188)	116 (312)
2: inf + neg	-136 (186)	-27 (344)	34 (195)	88 (339)
3: neg + fin	-111 (226)	102 (366)	33 (176)	209 (422)
4: neg + inf	-117 (203)	50 (338)	7 (163)	121 (358)

Table 4: Mean residual listening times (sd) for the different segments for native speakers of French

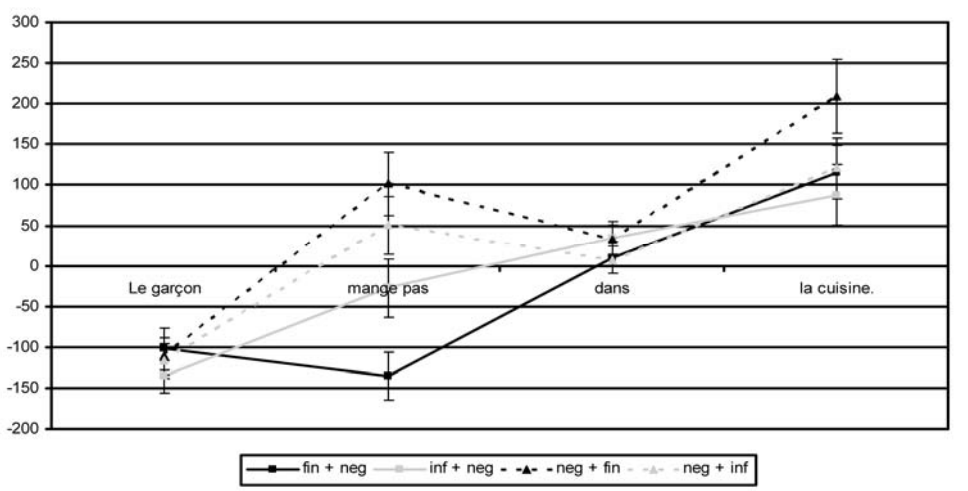


Figure 8: Mean residual listening times per condition and segment in the native speakers of French (error bars represent standard errors)

The listening times on the verb and negator complex revealed that contrary to the data from the native speakers of German, there was a main effect of negation ($F1(1,23) = 10.19$, $p < 0.01$; $F2(1,15) = 24.89$, $p < 0.001$), caused by the fact that postverbal negation was processed faster than preverbal negation. This was true for both types of verb forms. In addition, there was an interaction effect between the two factors ($F1(1,23) = 18.58$, $p < 0.001$, $F2(1,15) = 7.66$, $p < 0.05$). This effect was due to the fact that as in German, finite verbs were processed faster than non-finite verbs in postverbally negated sentences ($t1(23) = 2.64$, $p < 0.05$, $t2(15) = 3.15$, $p < 0.01$). Non-finite verbs tended to be processed faster than finite verbs in preverbally negated sentences, but this difference did not reach significance ($t1(23) = 1.44$ ns; $t2(15) = 1.02$, ns). There were no significant effects on the preposition (all $Fs < 2.5$). On the object, there were no significant effects except for a main effect of verb form which was only significant in the analysis via subjects ($F1(1,23) = 5.03$, $p < 0.05$, $F2(1,15) = 1.52$, ns, all other $Fs < 2$), indicating that finite verbs led to slower processing times than non-finite verbs. The interaction between the factors did not reach significance, but, numerically, the disadvantage for finite verb forms was stronger in the preverbally negated than in postverbally negated sentences.

Learners

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for regular verbs for the learners of French are summarized in Table 5 and Figure 9.

	Subject (Le garçon)	**Verb/negator (mange pas)**	**Preposition (dans)**	**Object (la cuisine)**
1: fin + neg	-179 (306)	-304 (327)	-1 (204)	93 (424)
2: inf + neg	-184 (297)	-172 (382)	-5 (206)	85 (458)
3: neg + fin	-158 (316)	-162 (398)	-9 (210)	48 (461)
4: neg + inf	-163 (342)	-139 (386)	11 (195)	-37 (376)

Table 5: Mean residual listening times (sd) for the different segments for learners of French

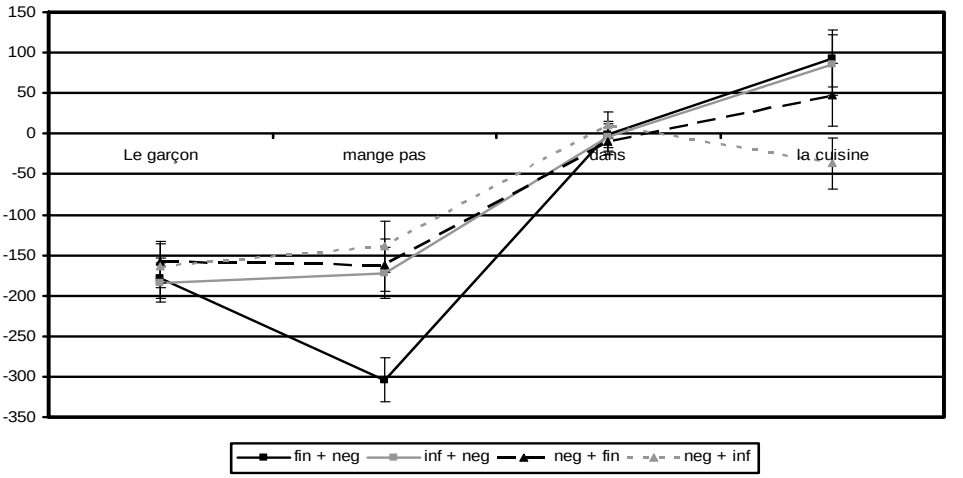


Figure 9: Mean residual listening times per condition and segment for learners of French (error bars represent standard errors)

The listening times on the verb and negator complex revealed a main effect of negation ($F1(1,39) = 7.52$, $p < 0.01$, $F2(1,15) = 13.54$, $p < 0.01$) indicating that postverbal negation was processed significantly faster than preverbal negation. There was also a main effect of verb form, indicating that finite verb forms were processed faster than non-finite forms ($F1(1,39) = 13.20$, $p < 0.01$, $F2(1,15) = 7.81$, $p < 0.05$). The interaction between the two factors did not reach significance ($F1(1,39) = 2.67$, $p = 0.1$, $F2(1,15) = 3.08$, $p = 0.1$). However, the numbers strongly suggest that the advantage for finite over non-finite verbs is mainly due to sentences with postverbal negation. There were no effects on the preposition. On the object, the pattern was different from the native speakers and much closer to the pattern shown by the learners of German on the preposition: The object was processed faster in sentences with preverbal negation than in sentences with postverbal negation ($F1(1,39) = 6.23$, $p < 0.05$; $F2(1,15) = 6.21$, $p < 0.05$). Numerically, objects following non-finite verb forms were processed faster than objects following finite verb forms, but this effect did not reach significance ($F1(1,39) = 2.19$, ns, $F2(1,15) = 2.73$, ns). There was no significant interaction between the two factors either ($F1(1,39) = 2.24$, ns, $F2(1,15) = 1.46$, ns).

Lexical verbs ending in -ir, -oir and -re

Native speakers

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for irregular verbs for the French native speakers are summarized in Table 6 and Figure 10.

	Subject (Le policier)	Verb/negator (écrit pas)	Preposition (à)	Object (ses grands-parents)
1: fin + neg	-133 (209)	-46 (379)	43 (177)	138 (321)
2: inf + neg	-172 (205)	-46 (338)	46 (176)	180 (358)
3: neg + fin	-118 (211)	117 (359)	96 (207)	253 (443)
4: neg + inf	-127 (189)	66 (375)	56 (200)	154 (376)

Table 6: Mean residual listening times (sd) for the different segments for native speakers of French

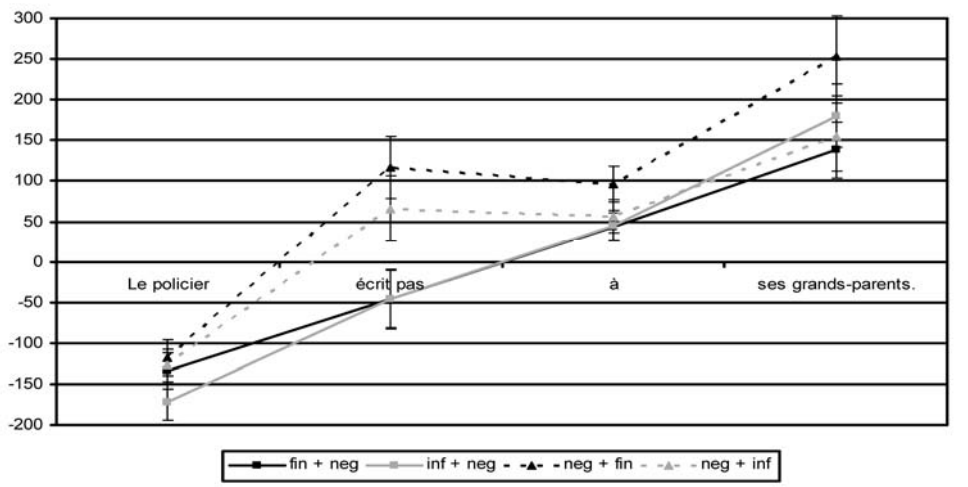


Figure 10: Mean residual listening times per condition and segment in the native speakers of French (error bars represent standard errors)

The listening times on the verb and negator complex revealed a main effect of negation ($F1(1,23) = 12.9$, $p < 0.01$; $F2(1,15) = 16.74$, $p < 0.01$), indicating that postverbal negation was processed faster than preverbal negation. Importantly, there was no effect of verb form and no interaction between the two factors on this segment (all Fs <1.1). A similar pattern still held on the preposition: There was a significant main effect of negation ($F1(1,23) = 4.19$, $p = 0.05$; $F2(1,15) = 4.48$, $p = 0.05$). In addition, there was a small tendency for non-finite verbs to be processed faster than finite verbs ($F1(1,23) = 3.05$, $p < 0.1$; $F2(1,15) = 1.38$, ns). There was no significant interaction between the two factors (both Fs < 2.3). On the object, there were no main effects (all Fs < 1.1), but there was an interaction effect between the two factors which was significant in the subject analysis and marginally significant in the item analysis ($F1(1,23) = 8.69$, $p < 0.01$; $F2(1,15) = 3.35$, $p < 0.1$). As in the data for verbs ending in *-er*, the object was processed faster for non-finite than finite verb forms in preverbally negated sentences, although this effect was only significant in the subject analysis ($t1(23) = 2.07$, $p = 0.05$, $t2(15) = 1.43$, ns). Numerically, the object was

processed faster for finite than for non-finite verbs forms in postverbally negated sentences, but this effect did not reach significance (t1(23) = 1.23, ns; t2(15) = 1.43, ns).

Learners

The mean residual listening times per condition for the regions subject, verb and negator, preposition and object for irregular verbs for the learners of French are summarized in Table 7 and Figure 11.

	Subject (Le policier)	**Verb/negator (écrit pas)**	**Preposition (à)**	**Object (ses grands-parents)**
1: fin + neg	-141 (307)	-166 (414)	56 (224)	198 (491)
2: inf + neg	-179 (276)	-165 (412)	68 (236)	239 (524)
3: neg + fin	-176 (301)	-12 (396)	52 (222)	124 (453)
4: neg + inf	-162 (303)	-41 (458)	52 (217)	95 (441)

Table 7: Mean residual listening times (sd) for the different segments for learners of French

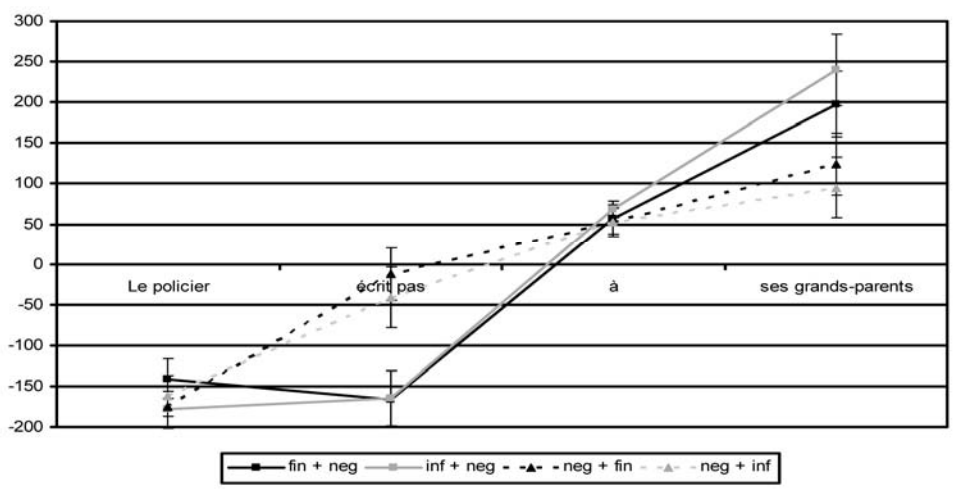


Figure 11: Mean residual listening times per condition and segment in the learners of French (error bars represent standard errors)

The listening times on the verb and negator complex revealed a main effect of negation (F1(1,39)= 11.67, $p < 0.01$; F2(1,15) = 10.75, $p < 0.01$) indicating that again postverbal negation was processed significantly faster than preverbal negation. There were no other effects (all F1s < 1). There were no significant effects on the preposition (all Fs < 1). On the object, there was a main effect of negation (F1(1,39) = 5.58, $p < 0.05$; F2(1,15) = 9.27, p <

0.01), indicating that the object was processed faster in sentences with pre- than in sentences with postverbal negation. There were no other effects (all other Fs < 1.2).

2.3.4 Discussion

For the native speakers of German, two questions remained open: first, why exactly verbs ending in *-en* caused a processing delay, and second, why an ungrammatical word order did not cause a processing cost. The data on French can help illuminate both of these questions.

As for the first question, the results strongly suggest that the effect of an unexpected verb form only occurs when the verb is possibly a finite form: It appears for the verbs ending in *-er*, but not for the other verb types used in the second version of the experiment on French. This is perhaps because it is costly in processing terms to change the morphology and re-compute agreement between the subject and the verb upon encountering an agreement error (see Pearlmutter et al., 1999, for a similar argument). This comparative processing difficulty was reflected both in the longer listening time to the verb and negator complex in sentence (1.2) as compared to (1.1) in German and in (2.2) as compared to (2.1) in French. In contrast, there was no delay when a clearly non-finite form was encountered, as in the second version of the French experiment ((3.2) vs. (3.1)). Apparently, no agreement checking procedure would be undertaken in this case, given that the form is underspecified for person and number. Importantly for the present study, the result for the regular verbs experiment confirms that native speakers are influenced by *syntactic* factors in their processing in the current study, while further specifying that this effect arises exclusively with verb forms that can be perceived as carrying wrong agreement markers, as opposed to unspecified verb forms which do not lead to any delay.

Second, the German experiment showed that not every syntactic anomaly must lead to a processing cost, and that there was no such cost for the word order violation in pre- as compared to postverbally negated sentences. The pattern of results in French looks very different in this respect. Whereas no effect was found in German, there seem to be two points in the sentence in which preverbal negation is processed more slowly than postverbal negation in French: on the verb and negator complex itself, on which the effect appears for both types of verb forms, and on the object, where a preference for post- over preverbal negation can be found which is restricted to finite verbs.[38] One possibility is that the processing of preverbal negation might be hindered here by the fact that this order is very rare in French, where in almost all possible grammatical contexts, a finite verb has to directly precede the negator.[39] The difference between the speakers of French and the

[38] Note that this effect appears numerically in a similar way in both versions of the experiment, but only reaches significance in the second version.

[39] One might argue against this that at least in written language, speakers of French are familiar with a preverbal negator due to the presence of *ne*. Apparently, this does not however facilitate the integration of preverbal *pas*.

speakers of German then would be that the latter sometimes encounter this order in grammatical constructions, albeit in subordinate clauses, whereas this is never the case in French. This explanation might be correct, but it leaves unexplained why there is an additional effect of pre- versus postverbal negation for finite verbs on the last segment, at least in the second experiment. The effect appearing at this point indicates that the wrapping-up process is particularly hard for sentences of type (3) as compared to the three other sentence types. This may be because difficulties in the other sentences have already been sufficiently dealt with before reaching the end of the sentence: Sentences of type (1) should not present a problem at any point of time during the processing of the sentence. Sentences of type (2) present the problem of an agreement error, but this problem is likely to be solved on the verb itself and has no further consequences later in the sentences. Sentences of type (4) cause a processing delay on the verb and negator complex, as the negator occurs in a very infrequent position for speakers of French. However, it might well be that the fact that the negator then is followed by a non-finite verb form makes it easier for the speakers to construct a final representation of the sentence. They could then represent the negator, verb and object combination as being a VP out of which the verb is not raised. However, for sentences of type (3), there is no straightforward solution: In addition to the infrequency of the negator in second position, there is also no obvious place to integrate the finite verb appearing after the negator. It seems likely that speakers eventually end up with some representation assigned to the sentence. What remains to be explained is then why such a solution can be found for sentences of type (4,) but not type (3) in French, whereas German natives are slowed down by neither of these. It seems very likely that this difference has something to do with the different word order pattern in subordinate clauses, as it is mainly in this respect that French and German differ. Plausibly, finite verbs can be integrated into the VP in German more easily, because this is acceptable in subordinate clauses in which raising of the finite verb out of the VP to C is blocked by the presence of the complementizer. Native speakers of German might use the locally coherent interpretation of a VP containing a finite verb for accommodating sentences of type (3), whereas this structure is not even locally coherent for native speakers of French. This is consistent with other studies on sentence processing in native speakers in which evidence for the importance of such locally coherent structures has been found (Ferreria et al., 2001; Tabor et al., 2004).

To sum up, the data from the native speakers of French provide additional evidence that native speakers are influenced by *syntactic* factors in their processing of the

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What seems to be more important is the generally fixed position of the negator in French when compared to German. This does not only hold in subordinate clauses, as discussed in the text, but also in other contexts: In general, the negator can take a greater number of different positions in the sentence in German, in particular to express scope relations, than is the case for the negator in French.

present stimuli sentences, and further specify the nature of the difficulties. Delays in processing occur when speakers have to correct an ungrammatical part of the sentence, in the current case, if they encounter an agreement error, and if they encounter a surface structure of elements for which it is not possible to find an at least locally coherent underlying syntactic structure. In addition, the strong reaction of native speakers of French to preverbal negation indicates that they might also be influenced by the frequency of input strings. Note that if they were influenced by semantic transparency of surface scope, the effect would have gone in the opposite direction. There is thus no evidence in the data of the native speakers that semantic factors determine the processing cost in these sentences.

This does not mean, as already discussed above, that semantics plays no role in native speakers' processing. It means that for the current stimuli sentences, the effects of syntax are stronger than any effect of semantics as manipulated here. The main question of the present study is whether these weights are reversed for beginning learners, that is, whether they are more influenced by semantics than by syntax in the type of sentences tested here. The results for the learners of German suggested that this is the case. In the following, the results of the learners of French in this respect are discussed.

As in the native speakers of French, there are two clearly different types of effects in the learner data, one on the verb and negator complex, and one on the object. In the learners, these effects go in different directions: Postverbal negation is preferred on the verb and negator, and preverbal negation on the last segment. Note that this fact in itself strongly suggests that there is more than one factor that influences processing cost.

The effect on the verb and the negator necessarily has to be an effect either of frequency or of grammaticality (it would go in the other direction if it was an effect of semantic transparency). If it is an effect of grammaticality, this means that the participants can project a raised structure, as is indeed suggested by their production, and, in addition, that they find this easier to process than an unraised structure. Moreover, it would then seem that the raised structure is successfully and effortlessly projected for finite verbs of the verb type ending in *-er*, and for both finite and non-finite verb forms for the type of verbs ending in *-ir*, *-oir* or *-re*. Based on results from production studies, it would not be unlikely that learners can only recognize the *-er* ending as clearly not fitting into a finite context, whereas they do not recognize the different endings of the other types of verbs as non-finite (Becker and Veenstra, 2003; Noyau et al., 1995; Perdue et al., 1992).[40]

As an alternative, a frequency-based explanation can also account for the findings, and there are reasons for which this seems a more likely explanation than the syntactic

[40] Note that on top of that, verbs ending in *-er* seem in general much easier to process for the learners, as shown in the very different residual listening times in the first and second versions of the experiment for learners. Whatever is the origin of this effect, it is not directly related to the main research questions and is therefore not further discussed here.

approach: First, such a frequency-based explanation has also been proposed for other effects in learners who from very early on seem to be sensitive to structural properties of the target language. For example, in a study by MacLaughin et al. (2004) (see also Osterhout, Poliakov, Inoue, McLaughlin, Valentine, Pitkanen, Frenck-Mestre and Herschensohn, 2008, for a summary of this study and follow-up studies), it was found that English learners of French showed an ERP-wave-form indicating the detection of an anomaly in a French stimulus sentence even after a few weeks of classroom learning only. The violations tested in this study correspond exactly to the violations used in the first version of the French experiment presented here, namely a verb form ending in -/e/ being presented in a singular context, e.g., *Tu adores*adorez le français* ('You like/*likes French'). The fact that these types of violations elicited firstly only a N400 (which typically reflects a reaction to lexical or semantic violations) and then, when the same learners were tested again some weeks later, a P600 effect (which is assumed to be a marker of syntactic violations) suggests to the authors that initially, learners are chunking the input. Later in development, when a true grammatical rule has developed, these chunks can be broken up and an analysis can be assigned to them, and only at this stage do violations elicit the P600, as they do in native speakers.[41] Based on this, it seems plausible that the learners tested here are at a stage at which they react to the frequencies of chunks, rather than to violations of grammatical rules. A second argument for a frequency-based explanation of the effect on the verb-negator complex as opposed to a syntactically based one is that this seems much more compatible with the advantage for preverbal negation on later segments of the sentence. If the effect on the verb and negator is syntactic in nature, this means that the learners' grammar must allow for a raised, but not an unraised structure. If this is the case, it would be very surprising that learners would not have automatized the scope-reversal operation that goes together with verb raising, and if they have, it is unclear why postverbal negation would lead to a processing delay on the last segment of the sentence. The frequency-based explanation, in contrast, goes well together with the observed reversed effect on the last segment: It might well be that a structure is first reacted to slowly because it is unfamiliar, but that this structure might still be easier to process on later segments for semantic reasons. Note, however, that it is difficult to find convincing independent

[41] Osterhout et al. (2008) do not discuss the relation between learners' production and comprehension. However, as discussed in more detail in the general discussion of this chapter, it might not be the case that the description that they give for analyzing the input corresponds to the grammar that learners use for producing utterances: It seems unlikely that the learners of French they test do not know that 'tu adorez' is incorrect and 'tu adores' is correct. It also seems likely that they use this knowledge in their production. Therefore it cannot be assumed that subjects would not yet be able to break up the chunks they hear in the input consciously. However, the subconscious processing that takes place for comprehension might not have automatized this knowledge and still be influenced in the processing cost by the familiarity of chunks. This is also the only way to maintain this frequency-based explanation for the current learners, who clearly also show knowledge of verb raising in their production.

evidence for frequency effects.[42] In particular for learners, it is unclear both what are the appropriate units for measuring frequency (e.g., does one have to count the frequency of specific lexical items or specific constructions, and if the latter is the case, how fine-grained should these constructions be defined), and what would be a relevant corpus in which the frequencies could be determined. To sum up, it can be concluded that both syntax and frequency are possible causes of the effects on the verb and negator region, and that frequency seems to be a more likely cause for the two reasons that have just been outlined.

As for the effects on later segments of the sentence, their origin is easier to determine. Only an effect of semantic transparency can explain that the object is processed faster after both finite and non-finite verb forms following the negator as opposed to these forms preceding the negator. A relatively late advantage for pre- over postverbal negation is reliably present in all three experiments for the learner groups, and not present for the native speakers. Note in particular that this effect emerges again in the present experiments for the learners of French, although these learners clearly show evidence for syntactic knowledge about verb raising, and although verbs follow the negator very rarely in French. This is a confirmation of the prediction of semantic approaches to language acquisition according to which preverbal negation should be easier to process than postverbal negation for beginning learners.

The details of the pattern, however, raise some additional questions. First, the effect appears later in French than in German: It is only present on the object, but not yet on the preposition. This can relatively straightforwardly be explained by assuming that on the preposition, there are still spill-over effects from the effect on the verb and the negator, leading to slower processing of pre- as compared to postverbally negated sentences and masking any semantic effect in favor of preverbal negation. This can explain why the effect only appears on the object in French. However, one might then ask why the effect seems to disappear on the object in German, at least for finite verbs. As discussed before (see footnote 36), this might be due to a syntactic effect (non-finite verbs may be easier to integrate into a VP) or a semantic effect (the assertion carrying operator—the finite verb—might be best placed before the negator). Learners of German seem to be more sensitive to this than learners of French, but as the nature of the effect is unclear, not much can be concluded from this. Note also that in the learners of German, an advantage for pre- over postverbal negation is initially present for both verb forms.

To sum up the results for the learners of French, there is strong evidence that these learners are influenced by the semantic transparency of scope relations when they process (later segments) of the sentences. In addition, they show a preference for post- over

[42] Note that this makes it also very difficult to further investigate why frequency effects seem to appear independent of morphology in the second version of the experiment, but modulated by morphology for regular verbs.

preverbal negation on the verb and negator complex which most probably is due to the greater familiarity of post- as compared to preverbal negation. In sum, the results for lexical verb sentences are thus in accordance with a semantic approach. In the next section, whether this conclusion can be supported by results obtained for auxiliary sentences is investigated.

2.4 Auxiliaries in German and French

The results of the preceding two experiments have been interpreted as providing evidence for a strong effect of semantic transparency and the frequency of certain strings on processing cost, whereas no evidence could be found that clearly supports an influence of syntactic constraints in early learners. A final test case for this interpretation are auxiliary sentences, which were tested in the last two experiments reported in the following.

2.4.1 Materials and predictions

Auxiliary sentences contained the auxiliary *haben* in German and *avoir* in French. Examples are given in (4) for German and (5) for French:[43]

(4.1) *aux + neg*: Das Kind hat ($_{ast}$ nicht ($_{neg}$ mit dem tollen Spiel begonnen)).
the child has not with the great game started

(4.2) *neg + aux*: *Das Kind ($_{ast}$ nicht ($_{neg}$ hat mit dem tollen Spiel begonnen)).

(5.1) *aux + neg*: L'homme a ($_{ast}$ pas ($_{neg}$ joué avec le jeune chien)).
the man has not played with the young dog

(5.2) *neg + aux*: *L'homme ($_{ast}$ pas ($_{neg}$ a joué avec le jeune chien)).

What are the predictions that can be derived for the different accounts based on the results found in the experiments so far?

First, if frequency has an effect in the same way as in the lexical verb experiments, it should lead to a slow down on the verb-negator complex in French. It is unclear whether the same effect would be expected in German, because auxiliaries do not directly follow the negator in German subordinate clauses, as the past participle always has to be placed between the negator and the auxiliary (note that this is obviously different for the finite lexical main verbs tested above). Therefore it cannot be excluded that a similar effect might appear in German.

[43] It was decided to not introduce non-finite and finite auxiliary sentences, as non-finite auxiliaries are extremely rare both in learner language and the input language, which would have made it difficult to interpret the results. Note that in the current materials, the word order is not the same in German and in French due to the different headedness of the VPs: In German, the participle is placed clause-finally, whereas it directly follows the negator in French.

More interesting for the current question are potential effects on later segments of the sentences, presumably reflecting syntactic and semantic integration costs. As already briefly indicated above, syntactic approaches would in general predict post-auxiliary negation to be more in accordance with the learner grammar than pre-auxiliary negation and therefore easier to process. Many syntactic approaches would derive this prediction from an assumed special role of auxiliaries (as Parodi, 2000, who assumes auxiliaries to be precursors of other finite elements in learner language, and Vainikka and Young-Scholten, 1996a, 1996b, who assume that auxiliaries are base-generated). Syntactic approaches that assume optionality in general do not always make explicit predictions about the processing of auxiliaries (Eubank, 1993/94; Meisel, 1997). These approaches might predict that there should be no preference in processing cost between post-auxiliary negation and pre-auxiliary negation. However, these approaches would make the same prediction for lexical verb sentences, and this was not borne out in the previously presented experiments. A finding in which there were preferences for lexical verbs, but not for auxiliaries, could not be accommodated by any of the syntactic approaches presented so far.

In contrast, semantic approaches would be compatible with a preference for pre- over postverbal negation for lexical verb sentences, but no preference or a preference for post-auxiliary negation for auxiliary sentences. This is because for lexical verbs, scope relations are transparently marked in preverbally negated sentences, but no clear difference can be determined for auxiliaries. A preference for post-auxiliary negation might result, however, if learners are sensitive to the presence of the assertion operator. The procedure and results of the auxiliary experiment are presented in the next section.

2.4.2 Procedure

There were 8 stimuli sentences for each language which can be found in appendix C1. The sentences were cut into the segments subject, auxiliary, negator, preposition, object and past participle. The sentences of this experiment were intermixed with the sentences of the first experiment and the fillers, such that each item of the auxiliary experiment appeared on one condition on two of the experimental lists, and the other condition on the other two lists. The procedure was otherwise exactly the same as for the lexical verb sentences. Note that the same sentences were presented twice to each participant in the French experiment (once in each version of the lexical verb experiment). To assure comparability with the results for German, only the results of the first presentation for each participant were included in the analysis.

2.4.3 Results

The accuracy on the comprehension question was highly comparable to that obtained in the lexical verb experiments, reaching 82% on average for the native speakers of German, 86%

for the native speakers of French, 42% for the learners of German and 49% for the learners of French. As in the previous analyses, all trials are taken into account in the following. Listening times were computed for all segments, and the ones for the auxiliary and the negator were collapsed. The analyses described in the following report the residual listening times, the raw and corrected listening times can be found in appendix D1. The residual listening times were cleaned so that listening times further away than 2 sd from the mean for each segment were excluded from further analysis. The two native speakers of German and the four learners of French who had to be excluded in the previous analyses were likewise excluded in this analysis. For the remaining participants, 5.3% of the data from the native speakers of German, 5.9% of the German learners' data, 6.4% of the French native speakers' data and 5.8% of the French learners' data were removed by the cleaning procedures.

Native speakers

The results for the native speakers of German are presented in Table 8 and Figure 12.

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	-93 (245)	-229 (244)	94 (160)	-166 (155)	114 (357)
2: neg+ aux	-63 (281)	-180 (280)	73 (167)	-135 (153)	199 (366)

Table 8: Mean residual listening times (sd) for the different segments for native speakers of German

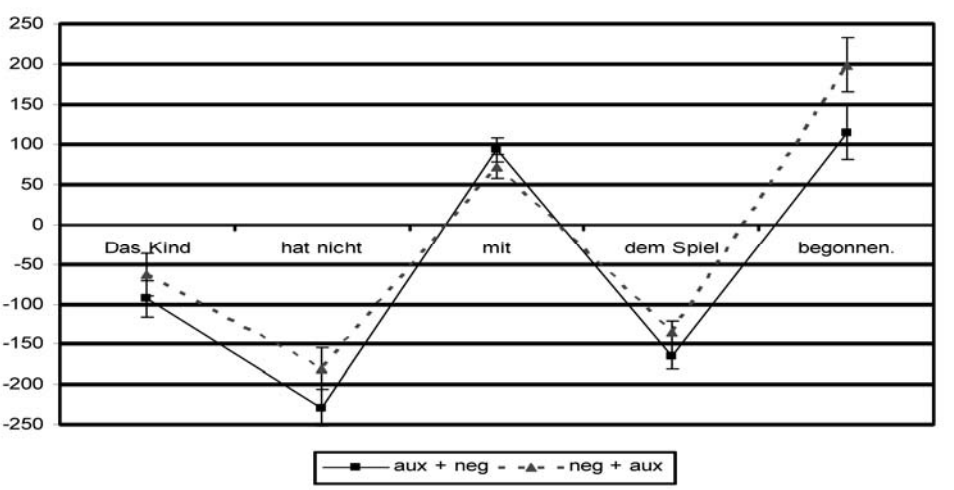

Figure 12: Mean residual listening times per condition and segment for native speakers of German (error bars represent standard errors)

Separate repeated measurements analyses of variance were computed on the verb and negator, the preposition, the object and the past participle with negation (pre- vs. postverbal) as a within-subject factor.

Although there was a numerical tendency on the verb and negator to process postverbal faster than preverbal negation, this effect was not significant ($F1(1,29) = 2.24$, ns; $F2(1,7) = 1.67$, ns). There was no significant difference between pre- and postverbal negation on the preposition (both $Fs < 1$). On the object, there was a tendency to process sentences with postverbal negation faster than sentences with preverbal negation, leading to a significant effect in the subject analysis, but no significant effect in the item analysis ($F1(1,29) = 5.46$, $p < 0.05$; $F2(1,7) = 2.97$, $p = 0.13$). On the final segment, the past participle, the same effect emerged more strongly and reliably in both the subject and the item analysis ($F1(1,29) = 6.15$, $p < 0.05$; $F2(1,7) = 9.41$, $p < 0.05$).

Learners

The data for the learners are summarized in Table 9 and Figure 13.

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	-125 (331)	-247 (422)	62 (218)	-172 (329)	119 (431)
2: neg+ aux	-112 (340)	-263 (394)	28 (234)	-183 (315)	116 (423)

Table 9: Mean residual listening times (sd) for the different segments for learners of German

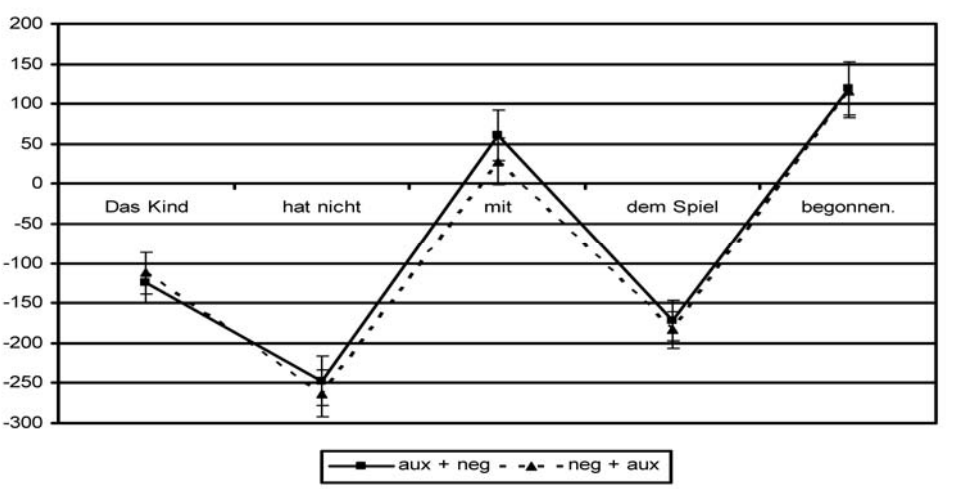

Figure 13: Mean residual listening times per condition and segment for learners of German (error bars represent standard errors)

As can be seen in Figure 13, the listening times to each segment did not differ from each other in the two conditions. There was indeed no effect on the verb and negator complex (both Fs < 1). Numerically, the preposition was processed faster after pre- than after postverbal negation. This tendency did however not reach significance (F1(1,46) = 1.78, ns; F2(1,7) = 1.65, ns). There was no effect on the object, nor on the past participle (all Fs < 1).

French

Native speakers

The results for the native speakers of French are summarized in Table 10 and Figure 14.

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	-92 (204)	184 (285)	-86 (235)	63 (177)	206 (359)
2: neg + aux	-103 (188)	227 (332)	105 (302)	56 (152)	282 (402)

Table 10: Mean residual listening times (sd) for the different segments for native speakers of French

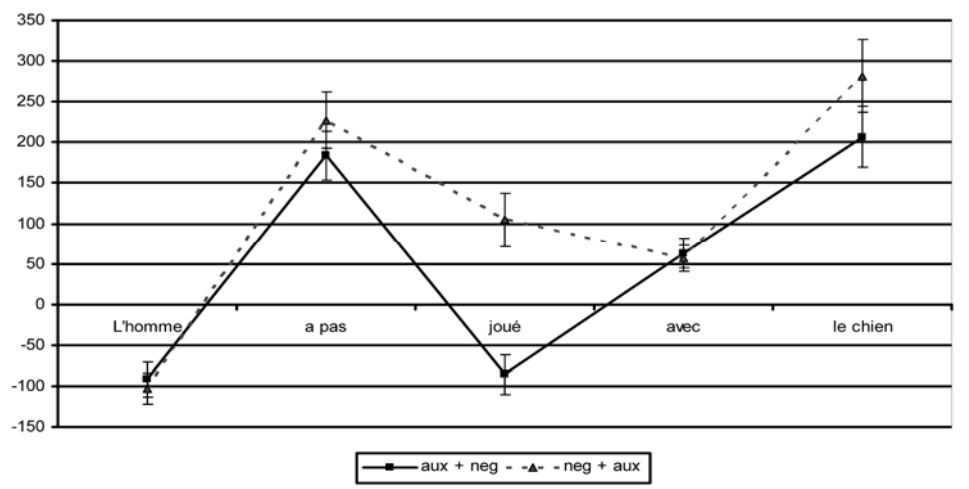

Figure 14: Mean residual listening times per condition and segment for native speakers of French (error bars represent standard errors)

On the verb and negator, there was a tendency to process postverbal negation faster than preverbal negation, which did however not reach significance (F1(1,23) = 1.58, ns; F2(1,7) = 2.18, ns). On the past participle, sentences with postverbal negation were processed much faster than sentences with preverbal negation (F1(1,23) = 18.08, $p < 0.001$; F2(1,7) =16.28, $p < 0.01$). There was no significant effect on the preposition (both Fs < 1.2). On the final

segment, the object, there were again faster listening times for postverbally as compared to preverbally negated sentences, but this effect was only marginally significant in the subject analysis (F1(1,23) = 3.99, p = 0.058 F2(1,7) = 1.88, ns).

Learners

The results for the learners of French are summarized in Table 11 and Figure 15.

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	-169 (316)	116 (409)	-75 (287)	98 (224)	224 (495)
2: neg + aux	-106 (329)	78 (416)	24 (310)	98 (225)	144 (405)

Table 11: Mean residual listening times (sd) for the different segments for learners of French

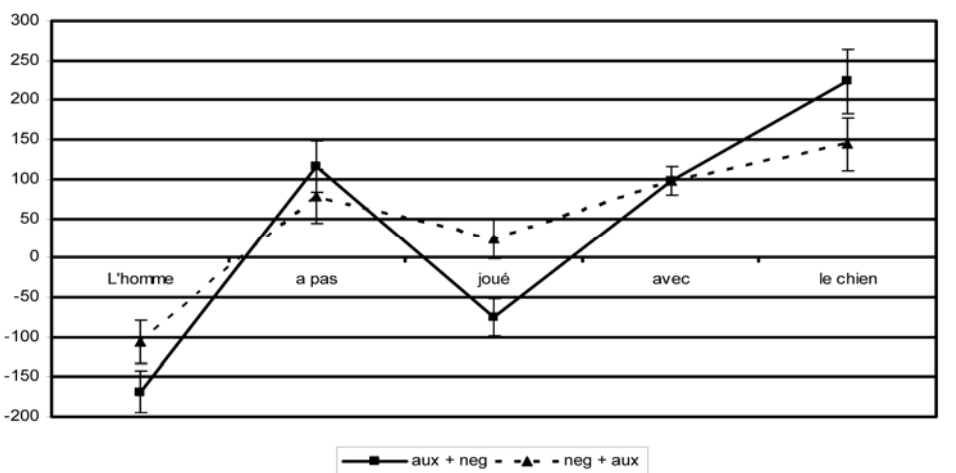

Figure 15: Mean residual listening times per condition and segment for learners of French (error bars represent standard errors)

Similarly to the native speakers, there were no significant effects on the verb and negator complex (both Fs < 1), but a preference for post- over preverbal negation on the past participle which was significant in the subject analysis, and marginally significant in the item analysis (F1(1,39) = 5.87, p < 0.05; F2(1,7) = 3.52, p < 0.1). There was no effect on the preposition (both Fs < 1). There was a tendency to process sentences with preverbal negation faster than those with postverbal negation on the object, but this effect was only marginally significant in the subject analysis and not significant in the item analysis (F1(1,39) = 3.47, p < 0.1; F2(1,7) = 1.98, ns).

2.4.4 Discussion

The results for the native speakers correspond very closely to what could be predicted from the lexical verb experiments. There is no reason why native speakers should treat auxiliaries differently from finite lexical verbs in this task, and indeed the results are very similar.

First, the results reflected a reaction to the infrequence of preverbal negation in French, which appears one segment later than in the lexical verb sentences (on the past participle). This is not surprising given the very short duration of the monosyllabic auxiliary in French. As would be expected based on the lexical verb experiment, this effect is absent in the native speakers of German.

Similar to the results for finite lexical verbs in the experiments reported above, there was an additional tendency to process preverbal negation more slowly than postverbal negation on the final segment in French, probably reflecting the difficulty of finding a possible syntactic analysis for a finite verb following the negator. Interestingly, a similar effect also appeared on the final segment for the native speakers of German, which did not appear for finite lexical verbs. Apparently, the ungrammatical word order is more difficult to accommodate for auxiliary sentences than for lexical verb sentences, which might be due to the fact that auxiliaries never follow the negator in the input in German (contrary to finite lexical verbs). Alternatively, it might also be that this effect is easier to detect in auxiliary sentences, as there are more segments following the verb and the negator.

To sum up, the results for native speakers confirm the results obtained for lexical verbs and suggest that native speakers are mainly influenced by *syntactic* factors in processing these sentences.

As for the learners, again there was the expected frequency effect for the verb-negator region in French (appearing on the past participle), but not in German. There were no other significant effects, suggesting that if these learners have a grammatical preference for raised over unraised structures, as can be assumed on the basis of their production, it is not reflected in this task. Note that this is a difference when compared to the results by Verhagen (2009), which is most probably related to the stronger form-orientation induced by sentence matching. It might be that the learners tested by Verhagen (2009) as well as the learners tested here *know* on some level that auxiliaries should precede the negator. However, when processing sentences for comprehension, which is what happens in self-paced listening, it seems to be more influential that on semantic grounds, pre- and post-auxiliary negation can be assumed to be similarly easy to process. The tendency on the object in French even seems to suggest that preverbal negation might be easier semantically, even for auxiliary sentences. However, as this effect did not reach significance, it is unwarranted to draw this conclusion. What can be concluded is that in contrast to native speakers, learners do not treat finite lexical verbs and auxiliaries alike:

They find preverbal negation easier to process with finite lexical verbs, but they show no clear preference for auxiliaries. This is consistent with the assumption that for the learners, processing cost in the current task is influenced by semantic, but not by syntactic knowledge.

3. General discussion

The main aim of the present study was to estimate the weight of syntactic and semantic factors in the processing of beginning learners, as compared to native speakers.

The overall conclusion that can be drawn on the basis of the present results is that semantic factors clearly have a stronger influence than syntactic factors on the processing cost of beginning learners, whereas native speakers' processing of the same sentences was more strongly influenced by syntactic factors.

In the native speakers, if there was a delay in processing, it could always be attributed to a syntactic or frequency factor, and never to a semantic factor. This does not mean that all syntactic ill-formedness necessarily leads to a processing delay, which was not the case in the present study. It also does not mean that semantic factors can never make processing difficult or easy for native speakers, however, that was clearly not the case for the simple sentences tested here.

In sharp contrast, in the learners, every effect that was observed could either be attributed to a frequency effect or to the semantic factor of scope marking transparency. The research questions developed in the introduction to section 2 can thus be answered in favor of a semantic approach for all three types of experiments: Learners of German and French favor pre- over postverbal negation with both finite and non-finite lexical verbs, and show no preferences for auxiliary sentences. This pattern of results cannot be explained by any of the syntactic approaches.

However, these effects were strongly modulated by unexpected effects of the frequency of the tested constructions. These effects could sometimes also be accounted for on syntactic grounds. However, the evidence for this was never conclusive, in particular, because it is hard to reconcile with the consistent preference for preverbal negation on later segments of the sentences.

This result is in line with the way the knowledge of beginning second language learners is conceptualized in the learner varieties approach to second language acquisition (Becker, 2005; Dimroth et al., 2003; Giuliano, 2003; Klein and Perdue, 1997; Perdue, 1993). The current results can be explained when assuming that learners have a grammar in which there are no strong syntactic constraints, and in which the order of different adjuncted phrases is mainly determined by general semantic and pragmatic principles.

This assumption does not exclude the possibility that at least subgroups of the tested learners might already have knowledge of target-like syntactic constraints concerning

verb placement. Indeed, the production of both learner groups shows that they are aware from relatively early on that light verbs have to be placed in a raised position. In addition, a large group of the French learners also used a raised position for lexical verbs, and all learners avoided the use of finite verbs in an unraised position, which is most likely due to syntactic knowledge. This means that most probably, learners have more syntactic knowledge than became visible in the present task. This however makes the finding that semantic factors strongly influence processing ease even more important. It shows that the influence of cross-linguistically valid semantic factors is not only present in the very first stage of language acquisition, in which no syntactic knowledge at all is present. On the contrary, it still seems to strongly influence processing even in learners who have at least some knowledge about functional categories in the target language, and who might be in a phase in which the weight of semantic and syntactic constraints is about to change. It might be that in this transition stage, learners make efforts to *produce* utterances that correspond to the newly acquired syntactic knowledge, whereas they fall back to the processing routines of the previous stage when processing sentences for comprehension, where syntactic well-formedness plays no role. In this sense, the current experiment might be a case in which a comprehension measure leads to a more conservative estimate of learners' syntactic knowledge than would do a production measure. On the other hand, this measure can provide evidence for a strong factor in learners' comprehension, semantic transparency, which might have been difficult to detect in a production task.

In order to gain a more complete picture of how the interplay of syntactic and semantic factors might change during the acquisition process and in which types of tasks learners rely more on which type of knowledge, it is necessary to combine different methodologies testing the same learners using similar structures. This aim is addressed inn the next chapter, by testing the same learners and using the same materials in an elicited imitation task.

Variable verb placement in L2 German and French: Evidence from production and imitation of finite and non-finite negated sentences[1]

Chapter 3

Abstract

This chapter examines the placement of finite and nonfinite lexical verbs and finite light verbs in production and elicited imitation of adult beginning learners of German and French. Theories assuming impaired syntactic representations (Dimroth et al., 2003; Vainikka and Young-Scholten, 1994) predict variable placement of lexical verbs and consistent placement of light verbs, whereas theories assuming native-like syntax predict variability for non-finite verbs and consistent placement of all finite verbs (Prévost and White, 2000). The results show that beginning learners of German have consistent preferences only for light verbs. More advanced learners of German and learners of French produce and imitate finite verbs in more variable positions than nonfinite verbs. This is argued to support a structure-building view of L2 development.

[1] A version of this chapter is currently under review for publication.

1. Introduction

Characterizing the syntactic knowledge that adult learners have in the language they are acquiring is a central issue in second language acquisition research. In particular, the observation that deviations in the use of morpho-syntax are a persistent phenomenon in L2 (see e.g. Klein and Perdue, 1997) has led researchers to propose that the underlying syntactic knowledge of learners is permanently impaired (Meisel, 1997), or that it only reaches a native-like state after a gradual structure-building process (Dimroth et al., 2003; Vainikka and Young-Scholten, 1994, 1996a, 1996b). Other researchers, however, have proposed that syntactic representations of L2 learners are native-like from an early stage of acquisition on, and that target-deviant utterances are due to problems in the surface realization of morphology (Prévost and White, 2000). Much research has been devoted to testing these hypotheses, but none has been conclusively rejected or confirmed so far. The aim of the present chapter is to contribute to this research by examining the linguistic knowledge of L2 learners concerning the placement of finite and non-finite verbs in negated contexts. The focus is on beginning stages of acquisition at which deviations from native-like utterances in the domain of verb morphology and placement are frequent. Note that contrary to the preceding chapter, the present chapter is only concerned with the *syntactic* knowledge that learners might have or not have. Other types of constraints that might govern utterance structure in the absence of or in addition to syntactic knowledge are not further discussed.

In the remainder of the introduction, the relevant properties of the target languages are briefly described, and the syntactic approaches introduced in the preceding chapter are summarized once more and classified according to whether they assume impaired or native-like representations in L2 syntactic knowledge. Subsequently, it is shown that the investigation of verb placement in negated contexts has proved to be a useful test case for these two opposing views, but that there are still open questions. In particular, contradictory claims have been made about the placement of finite lexical verbs, as compared to non-finite lexical verbs on the one hand, and finite light verbs on the other. The empirical section of the chapter presents a production and elicited imitation study with the same beginning Turkish learners of German and French that were tested in the preceding chapter, in which placement preferences for these three kinds of verb forms are systematically compared. The results provide evidence against a permanent impairment of L2 grammatical representations. However, they also show that there is more variability in verb placement than would be expected if the L2 grammar was native-like. The chapter concludes with suggestions for explaining these findings in light of the theories presented.

1.1 Finiteness and negation in German and French

As outlined in the introduction, verb forms are considered finite if they are marked for agreement and tense, as opposed to unmarked non-finite verb forms, such as infinitival and participle forms. As almost all verb forms in the present data set are either non-finite forms or present tense forms, only the presence of (present tense) agreement marking can be used to identify finite forms. The agreement paradigms of spoken German and French are summarized in Table 1 for the regular verbs *gehen/marcher* ('to walk').[2]

	German	French
1sg	ich geh-/ə/ / geh-0	je march-0
2sg	du geh-/st/	tu march-0
3sg	er geh-/t/	il march-0
1pl	wir geh-/ən/	nous march-/õ/ (formal) on march-0 (informal)
2pl	ihr geh-/t/	vous march-/e/
3pl	sie geh-/ən/	ils march-0
infinitive	geh-/ən/	march-/e/
past participle	ge-gang-/ən/	march-/e/

Table 1: Present tense agreement paradigms and non-finite forms in spoken German and French

As for negation, the negator is assumed to be the head of a NegPhrase in German and French, and to have a higher position in the phrase structure than the VP (Pollock, 1989). As shown in the preceding chapter, finiteness is related to verb placement in negated contexts in that finite verbs raise over the negator to a higher verbal functional category, whereas non-finite verbs remain in the VP (Chomsky, 1995). As a result, finite verbs appear to the left and non-finite verbs to the right of the negator in the surface form of the sentence. This is illustrated once more in (1a) and (2a) for German and (1b) and (2b) for French.

[2] The participants of the present study are mainly exposed to oral input, and all collected data are oral. To demonstrate the ambiguity in spoken language which does not exist to the same degree in writing, phonetic transcriptions of the suffixes are given. This will also be done in the following whenever it is not possible to decide which of two homophonous forms a learner intended to produce. In French, only the suffixes for the most frequent verb group are given, namely for verbs ending in *-er*. Verbs of other groups have a different infinitival (*-re*, *-oir* or *-ir*) and participal (*-u* or *-i*) ending, but in most cases the suffixes used for finite forms are the same as in Table 1. Note that in colloquial German, the schwa-forms can be omitted (Behrens, 1993).

(1a) Jan läuft nicht
(1b) Jean marche pas[3]
John $walk_{FIN}$ not
'John does not walk'

(2a) Jan möchte nicht laufen
(2b) Jean veut pas marcher
John $want_{FIN}$ not $walk_{INF}$
'John does not want to walk'

Finite light verbs such as modal verbs do not differ from finite lexical verbs in appearing to the left of the negator in both languages, as illustrated in (2).[4]

The contingency between finiteness marking on the verb and its position with respect to the negator not only holds in adult native speakers, but can already be observed in early child language in both German and French. Children's first verb forms are generally non-finite, and these verbs appear to the right of the negator in negated utterances. As soon as finite verb forms are used, these are placed in a raised position to the left of the negator (Poeppel and Wexler, 1993 for German and Pierce, 1989, 1992 for French). The contingency between finiteness and verb raising has been taken as evidence that children have adult-like syntactic representations at this stage of development (Poeppel and Wexler, 1993).[5] Their grammar comprises a verbal functional category above NegP to which finite verbs move. This finding from early child language raises the question whether the same is true for adult learners: Do L2 grammars also comprise a verbal functional category above NegP? This would predict that verb raising occurs in adult learner language as well. If this is the case, one might further ask whether the nature of the category is the same as in native speakers. If so, finite verbs should obligatory raise to this category, whereas non-finite verbs should always remain in their position below the negator.

[3] As in the preceding chapter, the position of the verb in French is always only discussed with respect to *pas*, not taking into account *ne*, which occurs pre-verbally in standard French but is very frequently omitted in colloquial French. Note that this follows previous studies on the same topic (Meisel, 1997; Prévost and White, 2000; Rule and Marsden, 2006).

[4] As mentioned in the preceding chapter, it has been assumed that light verbs also raise from a position lower than NegP in French (Pollock, 1989). For German, there is no agreement in the literature as to whether light verbs raise (as assumed for instance by Parodi, 2000) or whether they are base-generated in a position higher than NegP (as assumed for instance by Vainikka and Young-Scholten, 1996a). In both cases, they pattern with finite lexical verbs in the surface form of negated sentences.

[5] Poeppel and Wexler (1993) assume that children are aware of the relation between finiteness and verb raising because knowledge about this is provided by UG. Against this assumption, it has been argued that children have to learn the relation between finiteness and verb raising in a step-by-step fashion (see e.g. Jordens, 1990, 2002). The present study does not attempt to investigate this question for child language. It is uncontested that children reach adult-like knowledge about verbal functional categories at an early age, and the question of interest here is whether and how adult learners can achieve the same state of knowledge.

1.2 Functional categories in L2

According to a radical version of a grammatical impairment view, L2 syntactic representations do not comprise functional categories, neither in the initial state, nor as a result of development (Clahsen, 1988, 1990; Clahsen and Muysken, 1986; Meisel, 1991, 1997). It is argued that learners acquire the capacity to form native-like utterances by acquiring knowledge about "linear strings of elements encountered in utterances, not hierarchical syntactic sentence structures" (Meisel, 1997: 228). A less strong view proposes that functional categories as such exist in L2 syntactic representations, but that there are some aspects of the functional category system that cannot be acquired in a L2 (Franceschina, 2001; Hawkins, 2000b; Hawkins and Chan, 1997). With respect to finiteness, it has been proposed that verbal feature representations are impaired in L2-grammars (Beck, 1998; Eubank, 1993/1994, 1996). According to this proposal, feature strength is underspecified in L2 grammars, and as a consequence, verb raising is optional. Finally, researchers have suggested that functional categories are the result of a gradual structure-building process (Dimroth et al., 2003; Vainikka and Young-Scholten, 1994, 1996a, 1996b). According to this approach, early learner grammar only comprises a VP, but no higher verbal functional projections. These would then be built up gradually, passing through a stage of optional verb raising (Vainikka and Young-Scholten, 1996a, 1996b). Only at the end stage of development in this domain, when agreement marking has become stable, the functional category system would be native-like. The common feature of all these views is that they assume that L2 syntactic representations are impaired at beginning stages of acquisition. Following Prévost and White (2000), this common hypothesis will be referred to as the 'impaired representations hypothesis' (IRH). The IRH predicts that there should be no contingency between finiteness and verb raising during the acquisition process. It is assumed that agreement marking as well as verb raising remain unstable and unrelated phenomena in learner language for an extended period of development.

In contrast to impairment views, other researchers have claimed that L2 learners start out with a functional category system from the onset of acquisition on. The initial representations are either assumed to be provided by UG (Epstein et al., 1996), or to consist of the L1-representations (Schwartz and Sprouse, 1994, 1996). Native-like representations of the L2 are then assumed to rapidly develop by setting (or re-setting) parameters based on the input. These approaches predict a contingency between finiteness and verb raising from early on, parallel to what has been observed in child language. However, a frequent exception to this contingency has been observed: Several researchers have pointed out that non-finite verbs in raised positions frequently occur in L2-data, unlike what has been observed for L1 acquisition (Herschensohn, 2001; Ionin and Wexler, 2002; Lardiere, 1998; Prévost and White, 2000; Schlyter, 2003). To account for this phenomenon, it has been claimed by the above-cited authors that the unexpected use of non-finite forms is due to

morphological rather than syntactic problems. According to this hypothesis (termed the 'missing surface inflection hypothesis', MSIH, by Prévost and White, 2000), verbal functional categories are available to L2 learners in the same way as to native speakers. However, the process of selecting the correct morphological form to insert into a given syntactic position can sometimes fail in a L2. If selection of the intended form fails, default forms are used. Crucially, non-finite forms are assumed to be such default forms. The MSIH therefore predicts that non-finite forms can appear to the left of the negator when used as default forms and to its right when they are genuinely non-finite. Finite forms should occur to the left of the negator exclusively. The empirical evidence on the placement of finite and non-finite forms in negated contexts in L2 is reviewed in the following section.

1.3 Evidence from finiteness and negation in L2 acquisition

Empirical studies on finiteness and negation in L2 have come to conflicting conclusions. With respect to finite verbs, many have made a distinction between finite light verbs and finite lexical verbs (see Parodi, 2000 for an overview). For finite light verbs, there is converging evidence on the empirical facts, but no agreement on the interpretation of the findings. For finite lexical verbs, observations as well as interpretations are contradictory across studies. Finally, researchers have made converging observations on the placement of non-finite lexical verbs, but again differed in their conclusions. In the following, empirical results concerning each of these three kinds of verb forms are presented in more detail. First, the findings on finite light verbs and non-finite lexical verbs are presented. A second paragraph then summarizes the more contradictory findings for finite lexical verbs.

The placement of finite light verbs and non-finite lexical verbs

Researchers agree that light verbs such as the copula, auxiliaries and modal verbs almost always appear in a finite form and precede the negator in L2 German and French as well as in other target languages (Giuliano, 2003; Parodi, 2000; Schwartz and Sprouse, 1996; Vainikka and Young-Scholten, 1996a). Whereas this finding is well-established, it is controversial whether it allows for any conclusions about the existence of functional categories in L2 grammars. On the one hand, it has been argued that the presence of light verbs in raised positions is evidence for the fact that the L2 grammar comprises a functional category providing this position. According to this account, what is delayed in L2-acquisition is finiteness marking on lexical verbs, not the functional category system and the relation between finiteness and verb raising as such (Ionin and Wexler, 2000; Parodi, 2000; Zobl and Liceras, 1994). On the other hand, the very fact that the negator follows light verbs has also been taken as evidence for the idea that early L2 use is guided by semantic rather than syntactic principles. More precisely, it has been claimed that in early L2, the negator precedes the part of the utterance over which it has semantic scope. Lexical

verbs typically fall into the scope of negation, whereas light verbs, having no or little lexical content, usually fall out of its scope. This predicts that negation should follow light verbs, but precede lexical verbs and thereby offers an account for the placement of light verbs in a 'finite' position that is independent of finiteness (Becker, 2005; Bernini, 2000; Clahsen et al., 1983; Jordens and Dimroth, 2006; Meisel, 1983; Wode, 1981). The placement of finite light verbs preceding the negator is thus compatible with the MSIH when a syntactic account is taken, but also with the IRH on a semantic account.

As for non-finite lexical verbs, it is first of all noteworthy that they appear frequently as main verbs in L2 German and French, similar to what has been observed in first language acquisition (Dimroth et al., 2003; Haznedar and Schwartz, 1997; Klein and Perdue, 1997).[6] They predominantly appear after the negator in negated sentences but occasionally also precede the negator (Meisel, 1997; Parodi, 2000). This can also be explained by both approaches: Proponents of the IRH take the variable placement as evidence for the absence of a systematic relation between finiteness and verb raising. Proponents of the MSIH claim that non-finite forms in unraised positions are genuinely non-finite, whereas non-finite forms in raised position are default forms that are underlying finite (Herschensohn, 2001; Prévost and White, 2000; Rule and Marsden, 2006).

The placement of finite lexical verbs

With respect to the placement of finite lexical verbs, conflicting results have been reported. In studies on L2 French, researchers have claimed that finite lexical verbs behave as finite light verbs in exclusively preceding the negator (Herschensohn, 2001; Rule and Marsden, 2006). However, the learners in these studies were tutored, and, maybe as a consequence, used predominantly postverbal negation. Consequently, both non-finite and finite forms were rarely found after the negator. In studies on learners of L2 German or L2 French in immersion settings, several researchers have reported the occasional appearance of finite verbs following the negator besides their placement preceding it (Becker, 2005; Giuliano, 2003; Meisel, 1997; Parodi, 2000; Prévost and White, 2000; Vainikka and Young-Scholten, 1996a, 1996b). However, only Meisel (1997) concludes from this that syntactic representations are impaired. The other researchers doubt whether the finite forms observed in non-finite positions are 'truly finite'. For German, the (potentially) finite forms most often observed in unraised positions are bare stems or forms ending in *-e*. These forms have been claimed to be default forms in learner language (Parodi, 2000; Prévost and White, 2000; Vainikka and Young-Scholten, 1996b). In French, most of the finite verb forms are homophonous with the bare stem, which has also been claimed to be analyzed as a default

[6] Note that the present study is restricted to main verbs, so that it is not considered which form take other verbs that co-occur with a main verb in a sentence (for example in light verb constructions). This is however an interesting question for further research.

form by learners of French (Prévost, 2004). In addition to that, Prévost and White (2000) show that the incidence of finite forms in non-finite positions is lower than the incidence of non-finite forms in finite position in the data of two learners of French and two learners of German. They argue that if it is true that learners have no access to native-like syntactic representations during the acquisition process, as claimed by the IRH, then there is no reason why deviations from the target pattern should occur more often in one direction than in the other. However, the authors do not discuss the fact that finite forms are in general much more frequent than non-finite forms in their data, which are longitudinal data collapsed over time points. It therefore remains unclear whether the higher percentage of correct placement of finite forms is due to late stages of development in their data only.

To sum up, the available evidence has been taken to support both the IRH and the MSIH by different researchers. As the observed placement of finite light verbs and non-finite lexical verbs can be explained by both accounts, the crucial test case is the placement of finite lexical verbs: If the IRH is correct, their placement should be variable, as it is for non-finite lexical verbs. If the MSIH is correct, finite lexical verbs should behave like finite light verbs as soon as they are used by learners. Further evidence is needed to decide between these two predictions.

2. The present study

The aim of the present study is to test the competing theories of L2 syntactic knowledge by comparing the placement of finite lexical verbs to the placement of finite light verbs and non-finite lexical verbs in a relatively large group of learners at beginning stages of acquisition. Data were elicited in third person singular contexts in which forms marked for agreement are not homophonous with non-finite forms. Moreover, an effort was made to gain a comparable number of utterances per learner to avoid an overrepresentation of certain learners and thereby possibly of a specific stage of development. In particular, production data were combined with data from elicited imitation, which allows eliciting the same number of data points on all relevant structures from every learner.

2.1 Participants

48 Turkish learners of German and 43 Turkish learners of French participated in the study. All of these learners had previously participated in the self-paced listening task described in the preceding chapter. More information about the learners can be found in appendix A.[7]

[7] As shown in appendix A, some of the learners of German who participated in the imitation task reported in this chapter only participated in a pilot version of the self-paced listening task not reported in chapter 2, and some participated in self-paced listening, but not in the imitation task, so that there is no complete overlap between the groups of learners investigated in the two chapters. The learners of German who participated in the imitation task had been living in Germany for nine years on average, and the learners of French had been living in France for eight years on average at the moment of testing. The average age was 32.5 years in the learners of German and 34

2.2 Elicited Production

To assess learners' production, the same production data and coding procedures were used as in the preceding chapter. The placement of verbs was assessed in all negated utterances in which the main verb was either a finite light verb, a non-finite lexical verb or a finite lexical verb, finiteness meaning that the verb correctly agreed with the subject.[8] Recall that the IRH and the MSIH differ in their predictions for the placement of finite lexical verbs in comparison to the two other kinds of verbs. The IRH predicts that the placement of finite lexical verbs should be similarly variable as that of non-finite lexical verbs. The MSIH predicts that finite lexical verbs should be raised as consistently as finite light verbs.

2.2.1 Results

Table 2 shows the placement of the different kinds of verb forms with respect to the negator for all learners of German and French L2 respectively.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
Light verbs +fin	49	0	75	1
Lexical verbs -fin	3	58	6	11
Lexical verbs +fin	15	7	32	7

Table 2: Order of verb and negator for different kinds of verb forms in German and French

The results show that all three verb forms behave differently from each other. Finite light verbs almost exclusively precede the negator, whereas there are some exceptions to this placement for finite lexical verbs. This leads to a significant contingency between verb type (finite lexical verb vs. finite light verb) and placement in both target languages ($p < 0.001$, Fisher's exact test, in German, $p < 0.01$, Fisher's exact test, in French).[9] However, finite lexical verbs also differ from non-finite lexical verbs which predominantly follow the negator, leading to a significant contingency between finiteness marking and placement for lexical verbs in both languages (Fisher's exact test, $p < 0.001$ for German and $\chi^2(1) = 11.9$, $p < 0.01$ in French). Examples for negated utterances with different verb forms are given in

years in the learners of French. Learners of German had received on average six months of language teaching and learners of French nine months on average. In the present sample, the stimulus materials elicited on average 50 verb-containing utterances in third person singular contexts per learner, of which an average of 3.2 per learner were negated utterances.

[8] Regarding other kinds of verbs, there was one appearance of a non-finite light verb in German that was placed after the negator and two non-agreeing finite light verbs in French that were placed before the negator. There were also some finite, but non-agreeing lexical verb forms: 21 in German, 15 of which appeared with preverbal negation, and 2 in French which both appeared with postverbal negation.

[9] Following common practice, a Pearson χ^2-test is used for all comparisons in which the expected outcomes per cell are at least 5, and Fisher's exact test for comparisons in which at least one expected outcome is smaller than 5.

(3) through (11). They all stem from the descriptions of a scene in which one protagonist of the film, Mr. Green, does not jump out of the window even though there is a fire in his house:

light verb, raised position:

(3) aber er hat nicht gespringt
but he has not $jump_{PP}$

(4) il veut pas saut/e/
he want not $jump_{INF/PP}$

non-finite lexical verb, raised position:

(5) tomb/e/ pas
$fall_{INF/PP}$ not

non-finite lexical verb, unraised position:

(6) herr grün nicht fallen
Mr. green not $fall_{INF}$

(7) pas tomb/e/
not $fall_{INF/PP}$

finite lexical verb, raised position:

(8) aber herr grün springt nicht
but Mr. green $jump_{FIN}$ not

(9) il saute pas
he $jump_{FIN}$ not

finite lexical verb, unraised position:

(10) nicht springt[10]
not $jump_{FIN}$

[10] In utterances such as (10) in which the negator is either the first or the last element, one might wonder whether it is syntactically integrated into the sentence. Holistically used negators have reported to be *nein* in L2 German (Dimroth et al., 2003) and *non* in L2 French (Giuliano, 2003). Dimroth et al. (2003) suggest that these negators are modeled after the anaphoric answers to yes/no questions. Against this background, it seems unlikely that the negators investigated here are not part of the sentence.

(11) il pas saute
he not $jump_{FIN}$

The significant relation between finiteness marking and verb placement for lexical verbs is unexpected according to the IRH. On the other hand, the occasional placement of finite lexical verbs in unraised positions is unexpected according to the MSIH. However, it is possible that the IRH is correct only for very beginning stages of development, and that the unexpected placement of finite lexical verbs only occurs during these stages. In particular, it is not unlikely that finite verb forms in beginning learners are rote-learned forms, rather than forms productively marked for agreement. In line with this idea, several researchers have proposed that finiteness marking in learner language does not reflect any grammatical distinctions before its use has become productive and systematic (Jordens, 1990, 2002; Klein and Perdue 1997; Perdue, 1993). To investigate whether the systematicity of agreement marking is related to the relation between finiteness and verb placement, a median-split divided both learner groups according to the percentage of correct agreement marking on all lexical verbs in third person singular contexts. The percentage of correct agreement in this context is displayed in appendix B1 for every learner. In the learners of German, there were 24 learners who produced between 0 and 32% correct agreement (mean 13.88%) and 24 who produced between 32.4 and 94% correct agreement (mean 55.58%). In the learners of French, there were 22 learners who produced between 0.02 and 60% correct agreement (mean 37%) and 21 learners who produced between 62 and 100% correct agreement (mean 77%). Obviously, the median of the percentage of correct agreement is an arbitrary division point. It is not assumed here that this corresponds to a classification of learners into developmental stages. Moreover, it cannot be assumed that the split leads to comparable groups across target languages. Despite these limitations, a median split is useful for investigating whether the rate of correct agreement matters in the investigated domain. More precisely, if the two groups resulting from the split behave differently, one can conclude that the rate of agreement matters and subsequently constrain conclusions to learners in a specific range of correct agreement. If they do not differ, it might still be the case that there are subgroups in the population which have not been detected by the split. The results for the groups in which agreement was marked less frequently (low-agr groups in the following) are displayed in Table 3.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
Light verbs +fin	4	0	31	0
Lexical verbs -fin	2	36	6	5
Lexical verbs +fin	5	2	20	4

Table 3: Order of verb and negator for different kinds of verb forms in low-agr groups.

The preferred pattern is not the same in the low-agr groups in the two target languages: Whereas in French, there is a preference for finite verbs in raised positions, in German, the dominant type of negated utterances are non-finite verbs in unraised positions. However, although the number of cases for finite verbs in German and non-finite verbs in French is low, the relation between finiteness and verb placement is significant in German ($p < 0.001$, Fisher's exact test) and marginally significant in French ($p = 0.07$, Fisher's exact test). Verb placement is thus not random even before agreement marking has become systematic. In particular, it does not seem to be the case that all deviations from expected placements appear in the low-agr groups. This becomes more evident when looking at the data of the groups in which agreement was marked in more than 32% of all considered cases in German and in more than 62% in French (high-agr groups in the following), which are displayed in Table 4.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
Light verbs +fin	45	0	44	1
Lexical verbs -fin	1	22	0	6
Lexical verbs +fin	10	5	12	3

Table 4: Order of verb and negator for different kinds of verb forms in high-agr groups.

As expected, there is a contingency between finiteness and verb placement for lexical verbs in these groups ($p < 0.001$, Fisher's exact test, for German and $p < 0.01$, Fisher's exact test, for French). However, the placement of finite lexical verbs continues to be less systematic than the placement of light verbs, leading to a significant contingency between verb type and placement for finite verbs ($p < 0.001$, Fisher's exact test, for German and $p < 0.05$, Fisher's exact test, for French). In particular, there is no evidence that the error pattern is asymmetric in the way proposed by Prévost and White (2000): There are more exceptions in the placement of finite than of non-finite verbs. Summing up, all three kinds of verbs behave differently at both proficiency levels in both target languages. Finite light verbs consistently appear in a raised position, whereas there are some exceptions from this

placement for finite lexical verbs. Non-finite lexical verbs are predominantly placed in an unraised position.

2.2.2 Discussion

The data are problematic for both approaches to L2 syntactic knowledge: The IRH cannot explain the contingency between verb form and verb position for lexical verbs. For the MSIH, it is unexpected that finite lexical verbs differ from light verbs, but do not differ from non-finite lexical verbs in the number of deviant placements respectively. However, there are several limitations to the data. First, there is a risk of overestimating the contingency between finiteness and verb placement in production data in general. This is the case because perhaps some of the investigated utterances are composed of chunks of verbs and negators taken over from the input in an unanalyzed way. It has been shown that such unanalyzed chunks are often used in early L2 (Myles, Mitchell and Hopper, 1999). Instances of unanalyzed chunks are particularly likely to distort the pattern when the overall number of cases is low, as is the case for finite verb forms in the low-agr group in German. As it might be that some instances of finite verbs followed by a negator were in fact unanalyzed chunks, it seems premature to take these utterances as evidence for native-like syntactic representations. In French, the pattern is more reliable, as there is a higher number of finite verb forms. However, misplacement of these finite verbs still occurs relatively frequently for lexical verbs, but never for light verbs. One might therefore wonder whether an unraised position of finite lexical verbs is indeed prohibited in the L2 grammar, as claimed by the MSIH, or whether verb raising should be considered to be optional for lexical verbs. It is similarly difficult to draw strong conclusions from the occasional placement of finite lexical verbs in unraised positions in the high-agr groups. They might point to an optionality of verb raising, but as their number is small overall, they also might constitute random performance errors. In the second part of the study, additional evidence was gained by testing the same learners in an elicited imitation task.

2.3 Elicited Imitation

The use of the elicited imitation task relies on the well-established finding that the meaning of linguistic material is remembered much longer than its precise form (see between others, Anderson, 1974; Bartlett, 1932; Binet and Henry, 1894; Begg, 1974; Bock and Brewer, 1974; Fillenbaum, 1966; Johnson-Laird and Stevenson, 1970; Marlsen-Wilson and Tyler, 1976; Sachs, 1976; Wanner, 1974). For example, Sachs (1976) showed in a recognition task that shortly after having heard a sentence, native speakers were no longer able to discriminate that sentence from an alternative sentence that was only formally different (active vs. passive voice), while they could still distinguish it from a sentence expressing an alternative meaning. Similarly, Bock and Brewer (1974) showed in a recall task that

participants made more changes affecting the form than affecting the meaning of stimulus sentences when trying to recall them. Moreover, the formal changes participants made were such that they changed sentences to a form that they had judged superior in an independent judgment task, relative to the form in which the sentence was originally presented. More precisely, Bock and Brewer report a "large asymmetry in the recall data, with the preferred forms recalled correctly more frequently than the nonpreferred forms and the nonpreferred forms showing more frequent shifts to the preferred forms than vice versa." (Bock and Brewer, 1974: 843). These findings have been explained in terms of a reconstructive memory process. If it is impossible to retain a given stimulus sentence in working memory as a whole, subjects would presumably only retain the semantic gist of this sentence in long-term memory, and reconstruct its form when having to recall it (Binet and Henry 1894; Bock and Brewer, 1974). As a consequence, the changes that participants make to the original stimulus reflect participants' syntactic and lexical preferences.

In language acquisition studies, these observations have been the basis for using elicited imitation as a measure of grammatical knowledge (for first language acquisition: Kuczaj and Maratsos, 1975; Lahey, Launer and Schiff-Meyers, 1983; Menuyk, 1963; Slobin and Welsh, 1973; Smith, 1973, for second language acquisition: Batmanian, Sayehli and Valian, 2008; Epstein et al., 1996; Flynn, 1986; Hamayan, Saegert and Larudee, 1997; Markman, Spilka and Tucker, 1975; Munnich, Flynn and Martohardjono, 1994; Naimann, 1974; Verhagen 2005; see Vinther, 2002, for a review). More precisely, it is assumed that when learners make changes to a sentence while repeating it, these changes should reflect, as they do for native speakers, linguistic preferences of the learners. These preferences can then reveal grammatical knowledge. In particular, grammatical knowledge can be tapped if learners are presented with stimuli that are ungrammatical in the target language: If they normalize ungrammatical sentences to their grammatical counterparts, while repeating grammatical versions of the sentence unchanged, it can be assumed that they have knowledge of the grammatical structure in question.

These types of normalizations were indeed found in studies that presented ungrammatical target-sentences to (first or second) language learners: Kuczaj and Maratsos (1975) found that a two-year old English-speaking child consistently normalized utterances with misplaced auxiliaries (changing for a example "a nice cow eat will the good hay" to "a nice cow will eat the good hay"). Similarly, Smith (1973) found that children between 3 and 4 years normalized various types of syntactically deviant sentences, while making much less changes when repeating the grammatical counterparts of these sentences. These results were replicated by Hamayan et al. (1997), using the same types of structures, with Arabic second language learners of English. Finally, Verhagen (2005) found that Moroccan and Turkish second language learners of Dutch normalized the placement of auxiliaries with respect to negation in ungrammatical sentences, while not altering sentences in which

the auxiliary was placed in a target-like position. Interestingly, Verhagen (2005) as well as Kuczaj and Maratsos (1975) report that normalizations of misplaced auxiliaries occurred in subject(s) who did not produce any auxiliaries, suggesting that elicited imitation can reveal knowledge that learners are not (yet) able to use spontaneously in production. Smith (1973) investigated the relation between production and imitation in detail and found that there were three different types of structures in her data: structures that were spontaneously produced and normalized when presented in a deviant form during imitation, structures that were not spontaneously produced, but normalized, and structures that were neither spontaneously produced nor normalized in imitation. Instead, participants often rendered incomplete repetitions of the last type of structure or could not repeat it at all. Smith (1973) points out that in particular the second types of structures are interesting. She suggests that "perhaps with these structures we have cases of sentences that the children understand but do not use - sentences that are within there competence, but not to be found in their natural speech." (Smith, 1973: 512). Summing up, elicited imitation data seem to be suitable to confirm, in a controlled way, the presence of linguistic knowledge that can also be detected in production, and, in addition, might reveal knowledge that is not yet visible in production.

These previous findings from elicited imitation suggest that this task yields data that can complement the production data presented so far in a useful way. On the one hand, imitation data are close to production data as learners presumably rely on the same (unconscious) knowledge when reconstructing the sentence form in imitation that they also rely on in production. This makes production and imitation data more comparable to each other than, for instance, to data from conscious meta-judgments of grammaticality. In addition, elicited imitation has the advantage over production of yielding a comparable amount of data on all relevant structures. Whereas learners might avoid the use of certain structures in production, they cannot avoid structures in the imitation task. Moreover, it is unlikely that participants use unanalyzed chunks in this task, as they cannot choose themselves which lexical items to use. Finally, elicited imitation can reveal knowledge about structures that learners do not (yet) use in their production, as is the case for finite lexical verb forms in parts of the present learner sample. It seems thus that this task is suitable for circumventing the problem of testing theoretical claims on the basis of a small number of instances.

Note that the validity of the task hinges on the fact that participants should not be able to hold the presented sentences in working memory. In native speaker studies, this was achieved by introducing a delay between the presentation of the sentence and its repetition (e.g., Anderson, 1974; Sachs, 1976), or by introducing a secondary task that participants had to perform between the presentation of a sentence and its repetition (e.g., Bock and Brewer, 1974). The studies conducted with language learners did not use such additional delays or tasks. The results suggest indeed that a single sentence might already be too long

to hold in working memory for this population, and lead to a reconstructive process during repetition. The current study followed previous elicited imitation studies with second language learners, in having participants repeat sentences immediately after their presentation. Note that the length of the sentences was also comparable to those used in previous studies (in particular, Hamayan et al., 1997; Naiman, 1974 and Verhagen, 2005). The stimuli included sentences with finite light verbs, finite lexical verbs or non-finite lexical verbs in raised or unraised positions with respect to negation. Syntactic and morphological changes that occurred during the repetition of the sentence were analyzed in order to find out whether the patterns observed in learners' production can be confirmed in this more controlled task. More precisely, the behavior of finite lexical verbs was again compared to the behavior of finite light verbs and nonfinite lexical verbs, in order to gain more conclusive evidence about the knowledge learners have about the placement of these verb types with respect to the negator.

2.3.1 Materials

The materials were identical to those used in the previous chapter (see appendix C1). For light verbs, there were thus 8 sentences containing the auxiliaries *haben* in German and *avoir* in French.[11] In German, each of these sentences had between 10 and 13 syllables (average 12.5) and 9 words. In French, each sentence had between 10 and 13 syllables (average 11.75) and between 8 and 10 words (9 on average). Each sentence could occur in the same two conditions as in the previous chapter: In a grammatical condition, in which the auxiliary appeared before the negator, and in an ungrammatical condition, in which the auxiliary was placed after the negator. Examples for both conditions are given in Table 5.

German	**LV NEG**	Das Kind <u>hat nicht</u> mit dem tollen Spiel begonnen. the child has not with the great game start$_{PP}$
	NEG LV	*Das Kind <u>nicht hat</u> mit dem tollen Spiel begonnen.
French	**LV NEG**	L'homme <u>a pas</u> joué avec le jeune chien. the man has not play$_{PP}$ with the young dog
	NEG LV	*L'homme <u>pas a</u> joué avec le jeune chien.

Table 5: Light verb materials

[11] One particular light verb was used as opposed to several ones as different light verbs do not appear at the same stage of development in production. In the current learner sample, *haben* and *avoir* were not yet used by all learners, whereas other light verbs such as the copula appear in data of all learners. This means that if preferences for *haben* and *avoir* can be found even in beginning learners, this strongly suggests that preferences exist for light verbs in general, whereas generalizations from other light verbs to auxiliaries would not have been possible.

The lexical verb sentences for German had either 12 or 13 syllables (12.5 on average) and 8 words. Note once more that all of these verbs ended in *-en* in the infinitive and in *-t* in third person singular present tense contexts.

In French, the same two versions of the experiment were used as in the self-paced listening task, e.g., verbs ending in *-er* and irregular verbs ending in *-ir* or *-re*. As there was no difference between the results in the two versions of the experiment, they are collapsed in the following.[12] The French sentences had between 11 and 13 syllables (11.875 on average) and between 8 and 10 words (8.5 on average). Lexical verbs appeared in the same four different conditions as in the self-paced listening task: Finite verbs in raised and unraised positions and non-finite verbs in raised and unraised position. Examples for all four conditions are given in Table 6.

German	**-FIN NEG**	*Der Junge schreiben nicht an die traurige Tante. the boy write$_{INF}$ not to the sad aunt
	NEG -FIN	*Der Junge nicht schreiben an die traurige Tante.
	+FIN NEG	Der Junge schreibt nicht an seine traurige Tante.
	NEG +FIN	*Der Junge nicht schreibt an seine traurige Tante.
French	**-FIN NEG**	*Le président habiter pas dans une grande maison. the president live$_{INF}$ not in a big house
	NEG –FIN	*Le président pas habiter dans une grande maison.
	+FIN NEG	Le président habite pas dans une petite maison.
	NEG +FIN	*Le président pas habite dans une petite maison.

Table 6: Lexical verb materials

In order to maintain the same number of syllables across conditions, changes were made to the determiner or adjective in the later part of the sentences in those cases in which the non-finite verb form had one extra syllable when compared to the finite verb form. Finally, the same simple declarative present tense filler sentences were used as for the self-paced listening task (see appendix C1). There were 24 of these filler sentences for the experiment in German and 24 for each of the French experiments. Finally, recall that the speakers who prerecorded the stimuli sentences were instructed to read the sentences in a natural way, but slowly. In particular, care was taken that all verb endings were clearly audible.

[12] There were no qualitative differences between the results of the two versions of the experiment. Note however that quantitatively, the tendency to change non-finite to finite forms in second position, which is reported below, was much stronger for regular than for irregular verbs.

2.3.2 Procedure

The same four experimental lists were used as in the self-paced listening experiment in the German experiment as well as each version of the French experiment and were split into two halves of 24 sentences each. Halfway between the two, participants performed a range of other tasks. Each half of the experiment started with two warm-up sentences in both languages. Participants heard the sentences via headphones. If they were unable to repeat a sentence, they could listen to it again until they were able to repeat it or decided to skip the repetition of this sentence. All repetitions were recorded and transcribed.

2.3.3 Coding

A number of unclear cases was excluded from further analysis. This concerned two items in the French experiment which were excluded because the finite form of the verbs in question is homophonous with the past participle and therefore not unambiguously finite (the form /ecri/ of the verb *écrire*, and /ri/ of the verb *rire*). Moreover, 38 cases in German (3.3% of all data) and 101 cases in French (4.89%) were excluded because the recording was inaudible or participants introduced new elements or changed existing elements in the sentence.[13] Finally, there were cases that had to be discarded because participants omitted the verb, the negator, or both. The number of these incomplete repetitions was clearly different for the different verb types: There were more omissions for auxiliary sentences than for lexical verb sentences, due to frequent omissions of the auxiliary itself. All in all, 151 incomplete repetitions occurred in the two light verb conditions in German (19.66% of all instances of these conditions), and 318 in French (23.11%). There were 173 (11.26%) incomplete repetitions in the remaining four lexical verb conditions in German, and 240 (8.72%) in the remaining four lexical verb conditions in French. For the remaining cases (789 cases in German and 1327 cases in French), verb forms were coded as finite, non-finite or other, in the same way as in the production analysis, and the order of the verb and the negator was determined.

2.3.4 Analysis and predictions

The focus of the analyses is on changes occurring during the experiment rather than on successful repetitions alone. Changes during repetition are considered to be more informative, as correct repetitions might be due to participants retaining the presented

[13] These changes were replacements of a lexical verb by a light verb, or a light verb by a lexical verb, use of another negator than *nicht* in German or *pas* in French, placement of the negator in a position not adjacent to the verb, or multiple repetitions of the negator or the verb in the sentence such that no clear order was determinable. In French, there were also cases that had to be excluded in the lexical verb conditions because learners introduced an element between the subject and the verb that was not present in the original sentence and sounded like a light verb or a combination of a light verb with a clitic pronoun. See footnote 23 in the preceding chapter for a similar phenomenon in production.

sentence in working memory and repeating it without any reconstruction process. In contrast, changes presumably require the active use of grammatical knowledge. Three kinds of analyses were performed:

First, in a *syntactic* analysis, only those repetitions were taken into account in which participants successfully reproduced the presented verb form. It was then determined how often they maintained the order of the verb and the negator, and how often they reversed the order when repeating the sentences. If for a given kind of verb form the rate of change was higher from one position into the other position than the other way around, it was concluded that the latter position is preferred for this kind of verb form. In a second *morphological analysis*, how often participants changed the morphological form of the verb for a given position was analyzed. If for a given position, the rate of change was higher from one type of verb form into another type of verb form than the other way around, it was concluded that the latter type of verb form is preferred for this position. It is a drawback of separate syntactic and morphological analyses that overall preferences for certain structures over others might go unnoticed, as one and the same structure can be constructed either by a syntactic or by a morphological change. Moreover, participants occasionally made simultaneous changes of syntax and morphology and these changes were not taken into account in the first two types of analysis. For these reasons, it was determined in a third *combined analysis* how often each target structure occurred in all changes made in the experiment. As participants only made syntactic changes in the light verb conditions and never changed the morphological form of the light verb, the morphological and the combined analysis are restricted to the lexical verb conditions. The three analyses performed for lexical verbs are not independent of each other: As participants could choose to change sentences in multiple ways (syntactically, morphologically, or in both ways), the absence of changes of one type in a certain condition might be due to the fact that there is a high number of other kinds of changes in this condition.[14] For this reason, no conclusions can be drawn from the absence of one type of change alone. Rather, all three analyses are taken together in the following for interpreting the results in each group.

Both the IRH and the MSIH predict that if participants make changes to light verbs, they should reveal a preference for a raised over an unraised position for this kind of verb. For non-finite lexical verbs, neither of the theories predicts any specific preferences. Predictions differ for the behavior of finite lexical verbs. The MSIH predicts that if changes occur for lexical finite verbs, they should reveal a preference for this verb type to appear in a raised position: If syntactic changes are made, finite lexical verbs should be more often changed from an unraised to a raised position than the other way around. If morphological

[14] In theory, it could also happen that small changes seem more important in one condition than in another because a lot of other types of changes have already been made in this condition, which lowers the baseline to which the number of changes is compared. This problem did not arise in the present dataset.

changes are made, non-finite verbs should be preferred over finite verbs in an unraised position. No corresponding predictions are made for the raised position, as both finite and non-finite forms might be acceptable in this position because of the use of non-finite forms as default forms. The overall pattern of changes should show that participants do not change sentences into utterances containing finite verbs in unraised positions, whereas changes to finite forms in raised positions and non-finite forms in either position might occur.

In contrast, the IRH predicts that there should be no contingency between finiteness and placement preferences: If there are syntactic changes for lexical verbs, they should not differ for finite as compared to non-finite verbs. If there are morphological changes, they should not differ in the two positions. No particular utterance type is predicted to be absent from all changes involving lexical verbs that occur in the experiment. In the following, the results are presented separately for the two proficiency groups.

2.3.5 Results low-agr groups

Table 7 shows the results of the *syntactic* analysis in the low-agr groups, that is, the number of changes in verb placement in each condition out of all cases in which the verb form was repeated as it had been presented.

	German	French
LV NEG -> **NEG LV**	1.89% (1/53)	3.41% (3/88)
NEG LV -> **LV NEG**	33.33% (14/42)	13.33% (8/60)
-FIN NEG -> **NEG -FIN**	23.26% (10/43)	1.37% (1/73)
NEG -FIN -> **-FIN NEG**	14.58% (7/48)	0% (0/91)
+FIN NEG -> **NEG +FIN**	11.76% (4/34)	0% (0/89)
NEG +FIN -> **+FIN NEG**	18.18% (6/33)	2.22% (2/90)

Table 7: Percentage of changes in verb placement when morphology is maintained in low-agr groups

As predicted, there were significantly more changes from unraised to raised positions than from raised to unraised positions for auxiliary verbs in both languages ($\chi^2(1) = 17.4$, $p < 0.001$ for German and $\chi^2(1) = 4.82$, $p < 0.05$ for French). Examples for changes in auxiliary sentences are given in (12) for German and in (13) for French:[15]

[15] Note that here as in the following examples, learners also make other changes to the sentence than the ones investigated here, supporting the assumption that the sentence was not retained as a whole in memory and had to be reconstructed.

(12) *target:* Die Schwester nicht hat nach dem dünnen Buch gesucht.
the sister not has for the thin book search$_{pp}$

repetition: Die Schwester hat nicht diese dünne Buch gesucht.
the sister has not this thin book search$_{pp}$

(13) *target:* La sœur pas a vendu de café au lait.
the sister not has sell$_{pp}$ coffee with milk

repetition: La sœur a pas vendu le café.
the sister has not sell$_{pp}$ the coffee

For non-finite lexical verbs, the learners of German sometimes changed the position, but changes were not significantly more frequent in one direction than the other ($\chi^2(1) = 1.12$, ns). This is also in line with both the IRH and the MSIH. Unexpectedly for the MSIH however, the same pattern holds for finite lexical verbs: There were changes in both direction, but no position was clearly preferred ($\chi^2(1) = 0.54$, ns). The learners of French did not make a significant number of changes in the word order for lexical verbs at all. This finding will be taken up in the general discussion.

Table 8 shows how often participants changed the *morphological* form of a verb from finite to non-finite or from non-finite to finite in all repetitions in the lexical verb conditions in which the position of the verb was maintained.

	German	French
+FIN NEG -> **- FIN NEG**	11.76% (6/51)	3% (3/100)
-FIN NEG -> **+FIN NEG**	6.67% (3/45)	12.96% (14/109)
NEG +FIN -> **NEG -FIN**	9.52% (4/42)	6.42% (7/109)
NEG -FIN -> **NEG +FIN**	2% (1/50)	6.31% (7/111)

Table 8: Percentage of changes in morphology when verb placement is maintained in low-agr groups

In German, there is no evidence that any particular morphology is preferred in a certain position. Learners of French, however, prefer finite over non-finite verbs in raised positions ($\chi^2(1) = 6.66$, $p = 0.01$). In contrast, they do not prefer non-finite over finite verbs in unraised positions ($\chi^2(1) = 0.001$, ns). An example of this preferred type of change is given in (14):

(14) *target:* Le garçon manger pas dans la vieille cuisine.
the boy eat$_{INF}$ not in the old kitchen

repetition: Le garçon mange pas la cuisine.
the boy eat$_{FIN}$ not the kitchen

Finally, Table 9 presents an *overview of all changes* that occurred in the lexical verb conditions in the low-agr groups. These are all changes that have been displayed in Table 7 and 8 in addition to occasional occurrences of changes of both syntax and morphology.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
-FIN	16	17	3	10
+FIN	11	5	16	8

Table 9: Changes to each of the target patterns for lexical verbs in low-agr groups, absolute numbers

In German, the combined analysis shows that finite verbs in unraised positions are the least frequent pattern overall, but this effect is not strong enough to lead to a significant contingency of finiteness and verb placement ($\chi^2(1) = 1.79$, ns). In contrast, this contingency is clearly present for the learners of French ($\chi^2(1) = 6.41$, $p = 0.01$). This is however not due to an avoidance of finite verbs in unraised position, as predicted by the MSIH. Rather, the effect in French is carried by a difference in preferences in the second position, where finite, but not non-finite verbs occur.

All in all, the pattern of changes in German is in line with the IRH, but not with the MSIH: Learners made both syntactic and morphological changes, but no clear contingency between finiteness and verb raising could be observed for lexical verbs. In French, the data are not in line with the IRH, as finite and non-finite lexical verbs are treated differently from each other. However, there seem to be more restrictions on the placement of non-finite than of finite forms: Non-finite forms were frequently changed to finite forms when they were presented in a raised position, whereas they were mostly maintained in unraised positions. No such difference between the two positions could be observed for finite forms, which were maintained in raised as well as unraised positions. This pattern of results is unexpected for the MSIH and is further discussed after the presentation of the results for the high-agr groups.

2.3.6 Results high-agr groups

The same analyses were applied as for the low-agr groups. Table 10 shows the results of the *syntactic* analysis, that is, the number of changes in word order out of all cases in which the morphology of the verb was maintained.

	German	French
LV NEG -> **NEG LV**	1.52% (1/66)	4.31% (5/116)
NEG LV -> **LV NEG**	60.94% (39/64)	16.85% (15/89)
-FIN NEG -> **NEG -FIN**	13.56% (8/60)	5.75% (5/87)
NEG -FIN -> **-FIN NEG**	29.03% (18/62)	0.91% (1/110)
+FIN NEG -> **NEG +FIN**	5.66% (3/53)	0.85% (1/118)
NEG +FIN -> **+FIN NEG**	42.11% (24/57)	1.74% (2/115)

Table 10: Percentage of changes in verb placement when morphology is maintained in high-agr groups

Not surprisingly, the placement of light verbs in raised as opposed to unraised positions is preferred in the high-agr groups as it was in the low-agr groups ($\chi^2(1) = 53.9$, $p < 0.001$ in German and $\chi^2(1) = 8.83$, $p < 0.01$ in French). In German, this preference for raised over unraised structures can also be observed for lexical verbs. However, this is not only true for finite lexical verbs ($\chi^2(1) = 19.7$, $p < 0.001$), but also for non-finite lexical verbs ($\chi^2(1) = 4.87$, $p < 0.05$). Although the tendency to raise the verb is numerically stronger for finite than for non-finite verbs, the two rates of change do not differ significantly from each other ($\chi^2(1) = 2.22$, ns). In contrast, the rate of change for auxiliary verbs is significantly higher than the rate of change for finite lexical verbs ($\chi^2(1) = 4.28$, $p < 0.05$). Examples for raising of both finite and non-finite lexical verbs are given in (15) and (16), which present data from the same item, produced by different learners in different conditions:

(15) *target:* Der Kranke <u>nicht bleibt</u> in einem grossen Krankenhaus.
the sick person not stay$_{FIN}$ in a big hospital

repetition: Der Kranke <u>bleibt nicht</u> Kranken... grosse Krankenhaus.
the sick person stay$_{FIN}$ not hosp... big hospital

(16) *target:* Der Kranke <u>nicht bleiben</u> in dem grossen Krankenhaus.
the sick person not stay$_{INF}$ in the big hospital

repetition: Der Kranke <u>bleiben nicht</u> in dem Krankenhaus.
the sick person stay$_{INF}$ not in the hospital

In French, there is again no substantial number of changes for the lexical verbs.
The results for the *morphological* changes are summarized in Table 11.

	German	French
+FIN NEG -> **- FIN NEG**	1.45% (1/69)	2.36% (3/127)
-FIN NEG -> **+FIN NEG**	13.89% (10/72)	19.35% (24/124)
NEG +FIN -> **NEG -FIN**	13.33% (6/45)	5.47% (7/128)
NEG -FIN -> **NEG +FIN**	7.69% (4/52)	8.46% (11/130)

Table 11: Percentage of changes in morphology when verb placement is maintained in high-agr groups

The pattern for the learners of French is similar to the one observed in the low-agr group: Participants prefer finite verbs over non-finite verbs in raised positions ($\chi^2(1) = 18.9$, $p < 0.001$), whereas there is no clear preference in unraised positions ($\chi^2(1) = 0.89$, ns). The absence of a preference in the unraised position is not due to an absence of any changes in this position. Rather, as had also been the case in the low-agr group, participants made changes both from finite to non-finite and from non-finite to finite forms. An example of the first type of change is given in (17), and for the second type of change in (18).

(17) *target:* Le capitaine <u>pas lit</u> sur la plage de Marseille.
the capitain not read$_{FIN}$ at the beach of Marseille

repetition: Le capitaine <u>pas lire</u> à Marseille.
the capitain not read$_{INF}$ at Marseille

(18) *target:* Le président <u>pas habiter</u> dans la grande maison.
the president not live$_{INF}$ in the big house

repetition: Le président <u>pas habit-0</u> grande maison.
the president not live$_{FIN}$ big house

.
The same asymmetry can be observed in the learners of German: Whereas finite forms are preferred over non-finite forms in the raised position ($\chi^2(1) = 7.58$, $p < 0.01$), there is no clear difference in the preferences for the unraised position $\chi^2(1) = 0.83$, ns). An example of a change to a finite form in raised position is given in (19):

(19) *target:* Das Mädchen gehen nicht zu der alten Schule.
the girl go$_{INF}$ not to the old school

repetition: Das Mädchen geht nicht alte Schule.
the girl go$_{FIN}$ not old school

Finally, Table 12 presents the *combined analysis*, the absolute numbers of all types of changes involving lexical verbs in the high-agr groups.

	German		French	
	V-neg	**neg-V**	**V-neg**	**neg-V**
-FIN	22	16	4	15
+FIN	34	7	29	12

Table 12: Changes to each of the target patterns for lexical verbs in high-agr groups, absolute numbers

In both target languages, there is a clear contingency between finiteness and verb placement in this overall rate of change ($\chi^2(1) = 5.99$, $p < 0.05$ in German and $\chi^2(1) = 12.9$, $p < 0.001$ in French). In German, this is due to changes to finite verbs in unraised positions being very rare, whereas non-finite forms can occur in both positions. The reversed pattern can be observed in French: Changes into non-finite forms in raised positions are very rare, whereas changes into finite verbs in unraised positions can occur similarly frequently as changes into non-finite verbs in this position.

All in all, data from both target languages confirm the contingency between finiteness and verb placement predicted by the MSIH, which is unexpected for the IRH. Deviations from this pattern, however, are frequent. On the one hand, in German, participants changed non-finite verb forms from an unraised to a raised position. This suggests that participants in the high-agr group have a preference for a raised over an unraised position for main verbs which is independent of finiteness. This shows that non-finite verbs are compatible with a finite position in the L2 grammar, even though learners in this group do not often use this default option in their production. This type of deviation is in line with the MSIH.

On the other hand, however, the morphological analysis revealed that overuses are not restricted to non-finite forms. In French, there is clear evidence that finite forms can be used in a non-finite position: In contrast to auxiliary verbs, finite lexical verbs were not raised out of this position by learners of French. They were also not frequently changed to a non-finite form. As discussed above, it is difficult to draw conclusions from the absence of changes in an imitation task. However, the fact that participants changed non-finite to finite forms in second position suggests that if they have morphological preferences, they are

reflected in this task. This makes the absence of changes in the unraised position more telling than if no morphological changes had occurred in any position. In addition, the acceptability of finite forms in non-finite positions is also reflected in the fact that participants sometimes made active changes from non-finite to finite forms in this position.

In German, the evidence is less clear: Participants raised finite forms frequently if they were presented in an unraised position. This makes the absence of morphological changes less telling: If a relatively large percentage of the presented sentences in a condition is changed syntactically, there are fewer utterances left in which morphological preferences can show up. In contrast to the data in French, in which almost no syntactic changes occurred for lexical verbs, a direct comparison between morphological preferences in the raised position to those in the unraised position is therefore problematic in German. Note also that it is not expected that a pattern that is ungrammatical according to the L2 grammar should not be reproduced at all, as participants certainly can produce literal repetitions of a presented sentence form even if this form is ungrammatical for them. However, the fact remains that an unraised position of finite lexical verbs provoked fewer syntactic changes than an unraised position of auxiliaries, and that this difference is not due to participants recourse to morphological changes instead. This difference can be explained when assuming that some of the correct repetitions of finite lexical verbs in unraised positions are due to a higher acceptability of this pattern compared to unraised auxiliaries at least for some learners in this group. This finding is taken up in the general discussion, in which results from both tasks are brought together and examined in light of the different theories.

3. General discussion

Taking all presented results together, finite light verbs, non-finite lexical verbs and finite lexical verbs all behave differently from each other. This pattern can be explained neither by the IRH, which predicts finite lexical verbs to be as variable in their placement as non-finite verbs, nor by the MSIH, which predicts finite lexical verbs to be placed as systematically as finite light verbs. Rather the pattern of results suggests that both theories can account for only part of the data.

There are aspects of the data which are in line with the MSIH: There is evidence for a general contingency between finiteness and verb placement in all groups in production, and in all but the low-agr group in German in imitation. There is also evidence that exceptions from this contingency can occur due to the use of non-finite verbs as default forms. In particular, the production results show that learners of German and French

occasionally produced non-finite instead of finite forms preceding the negator.[16] In addition, the more proficient learners of German changed non-finite verbs from an unraised to a raised position in the imitation task, which provides additional evidence that these forms are compatible with a raised position in the L2 grammar in German. However, other aspects of the data cannot be explained by the MSIH. In particular, placement preferences for finite lexical verbs are not as clear as predicted by this hypothesis. Learners of all proficiency groups sometimes placed finite verbs after the negator in their production. In imitation, finite lexical verbs were not treated differently from non-finite lexical verbs in the low-agr group in German. The three other investigated groups made a difference between finite and non-finite verbs in imitation, but this difference was not in line with the predictions of the MSIH: Whereas participants changed non-finite into finite forms in a raised position, they did not change finite into non-finite forms in an unraised position.[17] Taking this together with the observation that finite verbs can appear in unraised positions in learners' production, the results ask for a description of the L2 grammar that can account for the fact that finite lexical verbs are not exclusively placed in a raised position. In the following, it is discussed which of the different theories of L2 syntactic knowledge can accommodate the occurrence of finite forms in unraised positions, while still accounting for the overall pattern of results.

The global version of the IRH as proposed by Meisel (1997) can explain the occurrence of finite forms in an unraised position by assuming that L2 learners cannot build up functional categories which would require the raising of finite verbs. Moreover, this theory need not be incompatible with the more consistent placement preferences for light verbs, when it is combined with a semantic approach to light verb placement. However, whereas the IRH can explain deviations from the target pattern, it cannot explain why the target pattern is present in the first place: Why do learners show a preference for finite forms appearing in front of the negator, and non-finite forms appearing after the negator? When assuming a global grammatical impairment in L2, it is hard to explain how learners are able to extract specifically this pattern from the input, while deviating from input

[16] It is possible that non-finite forms are not used as default forms in negated contexts by the learners of French, and that the rare occurrences of non-finite forms in second position are performance errors. This would also be in line with the assumption that learners have unimpaired syntactic representations. The idea that non-finite forms are errors receives support from the fact that their use is very infrequent and only appears in the low-agr group. Moreover, two of the six cases are uses of the past participle form of *dormir* (to sleep), which is *dormi*. As other French finite verb forms can end in *-i*, the occurrence of these forms might be explained by an unsuccessful attempt to form the finite form of *dormir*.

[17] One possible explanation for the lack of preferences in unraised positions could be that unraised main verbs are ungrammatical overall in the target language. If participants are aware of this, they might not show preferences for a form appearing in a position which is ungrammatical anyway. This could be an explanation for the pattern of results in the imitation task in isolation. However, this explanation seems unlikely in light of the fact that participants very frequently made use of unraised structures in their production.

patterns in many ways in their production as a whole. In particular, the contingency appearing between finiteness and verb placement with respect to the negator cannot be due to a simple learning mechanism according to which linear strings of lexical items that never appear in the input would be avoided. In German, plural verb forms can obviously occur before the negator, and these forms are homophonous to infinitives. On the other hand, finite forms can appear after the negator in subordinate clauses. As long as no more detailed mechanism is proposed which can account for the observed pattern, it has to be concluded that assuming a global impairment of L2 syntactic representation cannot explain the observed data as a whole. This also holds for those versions of a permanent impairment approach in which the existence of functional categories in L2 grammars is assumed (Beck, 1998; Eubank, 1993/94; Hawkins 2000b). These approaches suppose that L2 grammars are characterized by a local impairment in verbal feature strength, such that L2 learners cannot determine whether their target language has strong or weak verbal features, and as a consequence, whether verb raising is obligatory or prohibited. This should then lead to verb raising being optional and independent of agreement. As put by Beck (1998): "The local impairment hypothesis [...] suggests [...] that raising will always be divorced from any potential relationship to overt morphology" (Beck, 1998: 321). This is clearly not what is observed in the data of the present study.

Other researchers have proposed that grammatical impairment in L2 learners is not permanent, and that native-like representations can be gradually built up (Dimroth et al., 2003; Vainikka and Young-Scholten, 1994, 1996a, 1996b). With respect to the relation between finiteness and verb placement, only Vainikka and Young-Scholten make concrete predictions, so that the comparison of the present data with the predictions are restricted to the claims of these authors in the following. Vainikka and Young-Scholten (1996a) describe the following stages in the acquisition of German as a L2: At a first stage, at which only a VP is projected, participants produce almost exclusively unraised structures. Moreover, they have not acquired an agreement paradigm and use non-finite default forms. This then leads to unraised structures and non-finite forms going together, which does not however mean that the relation between finiteness and verb placement has been acquired. Rather, the dominance of non-finite verbs in unraised positions is due to the fact that neither verb raising nor subject-verb agreement have been acquired. At a following stage, the FP stage, a verbal functional projection is assumed to exist, but it is not specifically tied to finiteness: Verbs are raised independently of whether they are finite or not, as the agreement paradigm has not yet been acquired. Only at a final stage, the AgrP stage, should learners exclusively produce raised structures and finite verbs. Moreover, Vainikka and Young-Scholten assume that stages can co-exist, such that the production of a learner at a given time point mostly corresponds to one stage, but occasionally shows signs of the next stage: "What we mean by, e.g., being at the VP-stage is that a VP-based grammar is the

most robust one for the speaker; however, depending on the point of development that data collection took place, the grammar of the subsequent stage [...] may compete with the VP-grammar" (Vainikka and Young-Scholten, 1996a: 13). Such gradual transitions between phases are also assumed in other stage-models of development, as the one proposed by Dimroth et al. (2003). In the following, it is going to be argued that it is possible to account for the data of the present study by taking this structure-building approach.

Under this view, it seems that most participants of the low-agr group in German are at the VP-stage. This explains why the majority of learners' utterances is composed of non-finite verbs in an unraised position. The few instances of finite verbs in raised positions occurring in the production of this group might be unanalyzed chunks taken over from the input. This patterns well with the behavior of this group in the imitation task, in which no evidence could be found for a relation between finiteness and placement for lexical verbs. The fact that participants showed a preference for auxiliaries in raised positions would then strongly suggest that semantic factors constrain utterance structure in addition to purely grammatical constraints. It also suggests that at least some participants can project an underspecified FP even at this stage, which provides the landing site for the auxiliaries and explains the few changes to raised structures in the imitation task. This is not unexpected for the structure-building approach. The data for the three remaining groups are on first sight more difficult to reconcile with this approach: The fact that if verb raising occurs, it does so for finite, but not for non-finite verbs in most of learners' production suggests that these learners have already passed through the FP-stage to an AgrP-stage, in which verb raising is restricted to finite verbs. However, at the same time, non-finite verbs in unraised positions constitute a frequent utterance pattern. This suggests that participants backslide frequently not only to the FP-stage, but presumably even to the VP-stage in which default forms are preferred over finite forms and unraised over raised structures. The co-existence of all three stages is neither explicitly excluded nor proposed by Vainikka and Young-Scholten. However, this scenario does not seem unlikely in cross-sectional studies like this one. Here, data from learners in whom the different stages co-exist, but to a different degree of dominance in different learners, are collapsed. This might lead to properties of several stages showing up in the data of one proficiency group. The existence of finite forms in unraised position could then be explained by the fact that learners also sometimes backslide to an unraised utterance structure without necessarily adapting the verb's morphology to this structure at the same time.

An overall characterization of the data would then be that the IRH is correct only for very beginning stages of development. The MSIH is correct in assuming that native-like representations rapidly start to underlie at least a certain proportion of learner utterances. However, the MSIH seems to be wrong in assuming that only non-finite forms can be overused in learner language. In the present data, this only holds for the learners of

German: They seem to have a general preference for non-finite over finite forms. But in French, it is rather the finite forms that seem to be default forms. When backsliding into earlier phases, learners of French do not use a non-finite default morphology in unraised positions, as can be observed in German in most of the cases. Instead, non-finite and finite forms appear to a similar frequency in these unraised utterances. Note that all the uses of finite forms in these positions were uses of finite forms that were at the same time homophonous to the bare stem, as has been demonstrated in example (18). It might be that this form is used as a default form during a long phase of development, as suggested by Ferdinand (1996) for child French. The same suggestion has also been made by Prévost (2004) for English learners of French. However, Prévost (2004) suggested that the analysis of bare stems as default forms is caused by the fact that in English, the infinitival forms correspond to the bare stem. This is not the case in Turkish, so that the use of finite forms should not occur in Turkish learners of French according to Prévost. This prediction does not hold true for the present learner sample, suggesting that finite forms can be overused as default forms also by learners whose first language has an open morphological infinitive marker.

In addition to the different choice of default forms, there are several other striking differences between the learners of German and French. In particular, learners of French seem to develop not only a preference for finite forms, but also for finite positions relatively early in the acquisition process. As already noticed in the preceding chapter, the use of a raised position is more widespread in the learners of French when compared to the learners of German. This might be due to the fact that learners of German can find evidence in the input that verbs can appear in clause-final position, whereas learners of French rarely find such input. This is firstly due to the different word order in subordinate clauses. In addition, (non-finite) lexical verbs also appear more often clause-finally in main clauses containing light verb constructions in German than in French, due to the different headedness of the VP. Learners of German thus receive inconsistent input: The verb sometimes appears in second, and sometimes in final position. Given these two options, it seems plausible that Turkish learners of German develop a preference for the final position. First, this is the position the verb occupies in Turkish. Independent of whether one assumes the whole syntactic phrase structure to be transferred from Turkish or not, it is conceivable that even on a more superficial level, the resemblance between the verb position in Turkish and the clause-final position of verbs in some structures in German might have a facilitating effect on the use of this word order for Turkish learners. Second, keeping the verb in final position is in accordance with the syntactic knowledge of the learners at the beginning of the acquisition process. If learners can only project a VP, this is in accordance with keeping the verb in a final position in the sentence, at least for the present Turkish learners who presumably transfer a head-final VP from their first language. Vice versa, the fact that

learners receive evidence for verbs appearing in final position in the input might make them rely on this VP-based grammar for a relatively long time.

In contrast, learners of French do not receive any supportive evidence from the input that would encourage them to leave the verb in a clause-final position. The more consistent input might push learners to adopt a raised position for the verb earlier in the acquisition process when compared to the learners of German. One might wonder, however, how far this adoption of a raised position indeed reflects the acquisition of 'more native-like' grammatical knowledge in the learners of French when compared to the learners of German. The results of the production task as well as of the morphological analysis of the imitation task seem to suggest that verb raising is well established early in the acquisition process and also restricted to finite verbs relatively early, suggesting the development of a native-like functional category for the learners of French. But the results of the syntactic analysis show that there is a remarkable optionality between raised and unraised structures, as evidenced by the absence of syntactic changes for lexical verbs even in the high-agr group: These learners might rarely spontaneously produce unraised structures, for which no support is available in the input, but when confronted with it, they accept this structure and do not change it to a raised structure. This is in striking contrast to the learners of German, who do make such changes. Whereas the learners of German acquire verb raising only after a longer phase without raising, as soon as it is acquired, it becomes a strongly preferred structure. It seems that the fact that these learners had to overcome competing unraised structures leads to stronger established grammatical knowledge once this is achieved.

Although these explanations remain speculative, the data clearly suggest that even target languages which seemingly present the same acquisition problem to learners (a contingency between finiteness and verb raising) can lead to different learning paths in dependency of surface properties, such as the presence of alternative word orders in the input or the transparency of the agreement paradigm. This constitutes an interesting area for further research, and these observations are taken up in chapter 5.

Does finiteness mark assertion? A picture selection study with native speakers and adult learners of German[1]

Chapter 4

Abstract

This chapter investigates the interpretation of finite and non-finite utterances in native speakers and Turkish learners of German by means of a picture selection task. The results show that native speakers interpret finite utterances as assertions, whereas their picture choices for non-finite utterances are compatible with the assumption that these utterances lack the expression of assertion for them. These interpretation preferences constitute empirical evidence for the analysis of finiteness proposed by Klein (2006). Furthermore, it is shown that a beginning group of L2 learners interpreted non-finite utterances as assertions, whereas a slightly more advanced group, which had acquired the use of auxiliaries, showed more native-like interpretations of finite and non-finite utterances. This is in line with the stage model of assertion marking in the acquisition of Germanic languages proposed by Dimroth et al. (2003).

[1] An adapted version of this chapter will appear in Jordens, P. and C. Dimroth. (Eds.) *Functional Elements: Variation in Learner Systems.* Berlin/New York: De Gruyter.

1. Introduction

In contrast to the studies in the previous two chapters which dealt with formal aspects of finiteness, the study which is presented in this chapter is concerned with the function of finiteness in declarative main clauses in native speakers and beginning adult learners of German (data for French will be discussed in chapter 5). As has been established in the previous chapters, beginning learners often produce utterances which lack finiteness marking, as in (1), which was produced by a learner in the present study:

(1) herr grün noch schlafen
Mr. green still sleep$_{INF}$

This utterance is non-finite both morphologically and syntactically: The verb carries the infinitival suffix *-en* and is not marked for agreement or tense. Moreover, it appears in utterance-final position, which corresponds to the target-like placement of non-finite verbs. The predominance of non-finite utterances in the production of young children and beginning adult learners is a well-known phenomenon: Park (1971), Clahsen (1982) and Mills (1985) report their use in children acquiring German as a first language and Perdue (1993) in adult learners of German, and other studies confirm this observation (e.g. Behrens 1993; Clahsen and Muysken 1986; Meisel 1990; Vainikka and Young-Scholten 1996a, 1996b). All of these studies report that learners initially produce mostly non-finite utterances. They then acquire the present tense agreement paradigm and start marking the verb for agreement with the subject. Verb forms marked for agreement appear in the target-like second position in the sentence. An example of such a target-like finite utterance is (2), which was produced by the same learner as (1). The verb carries the *-t* suffix marking agreement with the third person singular subject:

(2) herr grün geht ins bett
Mr. Green go$_{FIN}$ to bed

Utterances of type (1) and (2) co-occur in learner language for an extended period of development, although only utterance (2) corresponds to the target language norm.

The co-occurrence of finite and non-finite forms has mainly been investigated from a formal perspective, as for example by Poeppel and Wexler (1993) in children and by Prévost and White (2000) in adult learners of German.[2] The aim of these studies was to

[2] Apart from the research on German reviewed in the text, the so-called 'optional infinitive phase' (Wexler, 1994) has also been described in the (first) language acquisition of other languages, among others French, English and Dutch (e.g. Haegeman, 1994; Harris and Wexler 1996; Pierce 1989). This research has also mostly taken a formal perspective on the phenomenon.

investigate whether optional finiteness marking means that learners' syntactic knowledge differs from that of adult native speakers. In contrast, a study by Dimroth et al. (2003) takes a functional perspective. The aim of this study was to investigate whether the knowledge concerning the function (rather than only the form) of finiteness is different in native speakers and learners. Whereas many studies taking a formal perspective have come to the conclusion that the syntactic knowledge in learners is target-like (Poeppel and Wexler, 1993; Prévost and White, 2000, but see Meisel, 1997 for a different view for second language learners), Dimroth et al. (2003) claim that the knowledge about the function of finiteness is not target-like at early stages of acquisition. According to them, finite forms are used for marking assertion by native speakers and advanced learners, whereas beginning learners have not yet discovered this function of finiteness and mark assertion via other means.[3] This entails that learners do not discriminate between the function of finite and non-finite forms in beginning stages of acquisition.

The findings of Dimroth et al. (2003) are based on production data. The aim of the present study is to test these findings in comprehension data from learners and native speakers. In a first step, the notion of assertion as used in the model by Dimroth et al. (2003) is summarized. The model is then presented in more detail, and the question of why it should be tested against comprehension data is motivated. Data from a picture selection experiment are presented, and it is concluded that they support the model proposed by Dimroth et al (2003). Whereas (1) and (2) differ in assertion marking for native speakers and, to a lesser degree, for advanced learners, this is not yet the case for beginning learners. More precisely, the analysis reveals that beginning learners make a difference between the two utterance types, but that it does not yet correspond to the target language distinction.

1.1 Finiteness and assertion in native German

The relation between assertion and finiteness has been developed in detail by Lasser (1997), who draws on work by Klein (1994, 1998). Klein argues that a finite utterance contains an abstract assertion operator that links the lexical meaning of the utterance to the time span the utterance is about, termed 'topic time'. In this way, linking means claiming that the state of affairs expressed in the utterance holds for the topic time of the utterance.

[3] Note that this concerns the function of finiteness in the target language. Dimroth et al. (2003) do not discuss the fact that second learners presumably have discovered the function of finiteness in their first language. It might therefore be that a more adequate description of the learning task is that learners merely have to find out how finiteness is *formally expressed* in the target language before they can use it in their production and comprehension of this language. In this case, the knowledge about the *function* of finiteness, as it is available in the first language, could not be used in the L2 until learners have gained enough knowledge about its surface realization in the target language. On the other hand, it is also possible that the knowledge about the function of finiteness is not transferred from the source language. As it is unclear how these two possibilities could be distinguished empirically, at least in the data collected here, the question will be left open.

According to this analysis, utterance (2) expresses by virtue of its morpho-syntactic form that it is true at a particular time point that Mr. Green goes to bed.[4]

This does not mean that utterances that are not marked for finiteness could not be interpreted as assertions. Consider the example given in (3):

(3) die Nudeln noch ein bisschen zudecken
the pasta still a little cover$_{INF}$
'I am (in the process of) covering the pasta for a short while'
(Lasser 1997: 50)

As indicated in the paraphrase, the speaker is describing his or her activity while performing it. The listener to this utterance can conclude from the discourse context that the descriptive content of the utterance holds at the moment of uttering it, and will probably take the utterance as a statement of this fact, thus as an assertion. In this way, utterances can be used and understood as assertions even if there is no formal marking of this, at least as long as the assertion is uncontroversial in the given discourse context, as is the case in example (3).

In sum, Lasser proposes that finite and non-finite utterances can both be used to make assertions, but that they differ in whether the assertion is explicitly marked by the form of the utterance. Utterance (2) is marked for assertion, whereas utterances (1) and (3) are not specified in this respect.

1.2 Finiteness and assertion in learner language

Dimroth et al. (2003) present a stage-model of assertion marking in the acquisition of Germanic languages. According to this model, assertion is marked by means other than morpho-syntactic finiteness in early learner language. This idea is based on the observation that utterances of beginning learners follow a strict word order: The first part of the utterance specifies the topic, understood as the entity, time or place for which a certain state of affairs is claimed to hold. This state of affairs is expressed in the second part of the utterance, the 'predicate'. Dimroth et al. (2003) claim that this utterance structure expresses, by default, that the information expressed in the predicate holds true for the topic at the topic time of the utterance. In addition, the relation between the topic and the predicate can be further specified by elements appearing between the topic and the predicate, in a so-

[4] One might wonder whether finiteness has the same function in non-declarative utterances, in particular, interrogatives. According to Lasser, an abstract assertion operator is present also in non-declarative sentences, so that the distinction between assertion- and non-assertion-making utterances is not the same as the distinction between declarative and other sentence modes. Whether this can be shown in speakers' interpretations is not investigated in the present study which is restricted to declarative utterances. The point is however taken up in more detail in the discussion.

called 'linking position'. The following examples illustrate that the linking position can be left empty (4) or filled with modal verbs (5). Other possible linking elements are the negator, particles and certain adverbials.

	Topic	Linking	Predicate
(4)	chaplin	Ø	gehen strasse
	chaplin		go_{INF} street
(5)	kind	will	telefonieren
	child	$want_{FIN}$	$telephone_{INF}$ (Dimroth et al. 2003: 79-83)

Dimroth et al. (2003) consider the described stage a lexical stage of assertion marking. They assume that the elements in the linking slot are used as assertion markers because their meaning (as opposed to their form) specifies the relation between the topic and the predicate. Learners then have to learn that assertion is expressed by morpho-syntactic means in the target language. This requires a reanalysis of the lexically-based system. Following Jordens (2002), Dimroth et al. (2003) assume that this reanalysis is triggered by the acquisition of the auxiliary system, that is, structures which contain the auxiliaries *haben* or *sein*, as in (6):

(6)	der charlie	hat	auch gemacht
	the charlie	has	also $make_{PP}$ (Dimroth et al. 2003: 87)

These auxiliaries are used to express completed aspect and reference to the past. The auxiliary that appears in the linking slot therefore differs from the verbal linking elements acquired earlier in that it does not express a modal, but an aspectual or temporal meaning. According to Jordens (2002) and Dimroth et al. (2003), this changes the analysis of the linking slot from a lexical to a grammatical category, thereby leading to a shift in the way assertion is marked. The authors assume that learners associate assertion with finiteness from this point on, first on auxiliaries, and subsequently also on lexical verbs. It can be concluded that as long as the association between finiteness and assertion marking has not been understood by learners, finite and non-finite utterances should not differ with respect to assertion marking. There might be reasons why certain verbs tend to appear in a non-finite and others in a finite form in early learner language[5], but whichever form they take should be irrelevant with respect to utterance meaning at this stage of acquisition.

[5] In particular, it has been found that non-finite forms tend to be associated with eventive verbs and appear in modal and future contexts, whereas finite forms tend to be associated with stative verbs and appear in utterances referring to the present in German as well as other languages (see de Haan 1987; Hoekstra and Hyams 1998; Jordens 1990). This finding is taken up in the discussion.

1.3 Aim of the present study

The model presented by Dimroth et al. (2003) explains the optional character of finiteness marking in early learner language and also suggests a trigger for the change to a more native-like use of finiteness, namely the acquisition of the auxiliary system. But since this model is based on production data only, it necessarily relies on researchers attributing functions to certain elements in learners' and native speakers' utterances. It has not been tested yet whether the assertion marking function of finiteness can also be evidenced in interpretation preferences of language learners and native speakers. If native speakers and advanced learners, but not beginning learners, can be shown to associate finiteness with assertion, this would support the model proposed by Dimroth et al. (2003). If native speakers do not interpret finite and non-finite utterances as differing in assertion, this would cast doubt on the relevance of this function for the acquisition process. In comprehension, it is possible to compare the understanding of finite utterances to the understanding of otherwise identical utterances not marked for finiteness. Moreover, in an experimental setting, these utterances can be presented in a discourse context which does not make the function of assertion inferable for the hearer. The difference in finiteness marking should then lead to a different interpretation of the utterances by native speakers and advanced learners. More precisely, if finiteness is indeed the formal marker of assertion for native speakers of German and for learners who have acquired the use of the auxiliary system, prediction (1) should be borne out:

> (1) If the function of assertion cannot be inferred from the discourse context, native speakers and learners using auxiliaries should interpret a finite utterance more often as an assertion than a non-finite one.

Moreover, if finiteness is indeed not yet a marker of assertion for learners of German who have not yet acquired auxiliaries, prediction (2) should be borne out:

> (2) In learners who do not yet use auxiliaries, there should be no difference in the interpretation of finite and non-finite utterances with respect to assertion in any discourse context.

In the present study, native speakers and learners were presented with finite and non-finite utterances to test the above-given predictions. The interpretation of these utterances was assessed by means of a picture selection task (see Gerken and Shady, 1996, for a detailed presentation of this task).

1.4 Logic of the task

In the following, relevant methodological decisions in the design of the task will be discussed in turn. This concerns the assumed interpretation of non-finite utterances, the context in which they were presented in the experiment, and the design of the pictures from which participants could choose in order to indicate their interpretations.

1.4.1 The interpretation of non-finite utterances

According to the analysis of finiteness summarized above, a non-finite utterance merely refers to a certain state of affairs, without asserting that this state of affairs is true for any particular time span. As has been shown above when discussing example (3), the asserting function can usually be inferred from the discourse context if speakers choose to leave out formal markings of finiteness. However, if the discourse context does not encourage such an inference, what would then be the interpretation of an utterance in which the lexical content of a sentence is expressed, but not marked as being asserted? In Standard German, constructions of this type are not infrequent (Fries, 1987). Typically, they are used to express doubt or incredulity with respect to something that was just said (Klein, 2006; Lasser, 1997). In a way, they function like echo-questions; but in contrast to those, no question function is marked, and they need not be understood as questions. The following two examples collected by Lasser illustrate this:

(7) Ich (und) ins Studie gehen?!
I (and) to-the gym go_{INF}
'What! Me go to the gym?' (Laser 1997: 40)

(8) Henry (und) heiraten ?! wirklich nicht
Henry (and) $marry_{INF}$?! really not
'Henry getting married? I don't think so' (Laser 1997: 40)

According to Lasser, such utterances "may, but need not involve rising intonation" and presuppose that "from the point of view of the speaker, the proposition expressed is false or at least debatable" (Lasser 1997: 40). The idea that the absence of finiteness marking in these sentences *contributes* to the expression of doubt is straightforward when assuming that a core function of finiteness is the marking of assertion. In the present experiment, it was therefore assumed that if non-finite utterances are interpreted as expressing doubt more often than finite utterances, this supports the analysis of finiteness as an assertion marker.

1.4.2 The context of presentation

The 'doubt' interpretation of non-finite utterances is only obtained in certain discourse contexts. A non-finite utterance can be used to express doubt only if the speaker and his or her interlocutor do not take the truth of the assertion for granted. The expectations built up in the discourse context are thus essential for the interpretation of non-finite utterances. For this reason, the utterances that had to be interpreted by the participants of the experiment were embedded in a dialogue. An example of the type of dialogue used is given in (9). Answer B1 represents the finite utterance that is expected in the given discourse context, and utterance B2 the corresponding non-finite utterance.

(9) A: Glaubst du, dass Peter einen Tisch baut?
'Do you think that Peter constructs a table?'
B1: Peter baut einen Tisch.
Peter construct$_{FIN}$ a table
'Peter constructs a table'
B2: Peter einen Tisch bauen.
Peter a table construct$_{INF}$
'Peter construct a table'

The yes/no question in the first part of this dialogue makes clear that the truth of the sentence content cannot be taken for granted. It is for this reason that finiteness marking is expected in the answer, and that the absence of it in the second version of the dialogue can be taken to mean that B doubts whether Peter constructs a table at the relevant time span.

However, using a non-finite utterance is only one way of expressing doubt. It asks for some pragmatic reasoning to come to the conclusion that if a speaker leaves out the marking of assertion, he or she might want to express doubt. An alternative interpretation of a non-finite utterance might be that the form was not produced intentionally, but that the speaker made a performance error. This is conceivable in particular because non-finite utterances are usually considered ungrammatical in German. To make the first interpretation more readily available for the participants in the experiment, two trigger conditions were created which consisted of finite and non-finite utterances respectively, but with a rising intonation both on the topic and the predicate part of the utterance (in contrast to all other utterances in the experiment which had a falling intonation contour). It was assumed that a rising intonation contour enhances the likelihood that hearers interpret an utterance as expressing doubt, and that this interpretation should be attributed relatively easily to the utterances in the trigger conditions. It was further assumed that this would also make this meaning more available for other utterance types in the experiment. In addition, expressing doubt via intonation is unique to spoken language. The use of intonation in the

trigger conditions should make it easier for participants to understand that they can take the utterances in the experiment as spontaneously spoken utterances. As a consequence, non-finite utterances should more likely be taken as meaningful choices rather than as performance errors. The trigger conditions were included for both non-finite and finite sentences in order to avoid introducing a bias for non-finite sentences only.

1.4.3 The pictures

In the experiment, participants heard dialogues of type (9), which always began with a yes/no-question. They then had to indicate their interpretation of speaker B's answer by selecting one out of three pictures. One of the pictures represented B's intention to express an assertion ('assertion picture' or 'picture A' in the following), and another one depicted B's doubt about whether the content of the utterance was true ('open picture' or 'picture O' in the following). The third picture (the 'completed picture', or 'picture C') was a distractor picture. If only two pictures had been presented, it would have been impossible to know whether a picture was chosen because it matched the presented utterance, or because the remaining picture did not match the presented utterance. This problem is attenuated if participants can choose from three pictures. The three pictures for the item "Peter constructs a table" are shown in Figure 1:

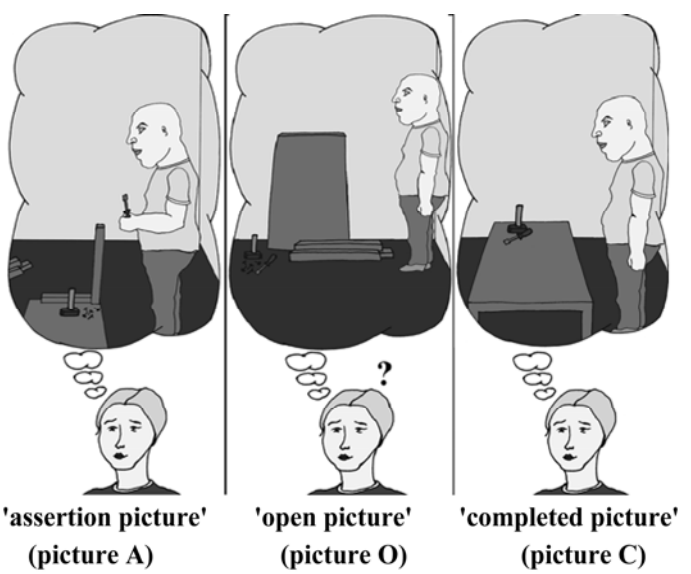

Figure 1: Pictures for item "Peter constructs a table"

Note that not only the performance (or lack thereof) of the activity is depicted, but also the speaker of the critical sentence (speaker B in the example dialogue above). The inclusion of

B in the pictures was meant to highlight B's thoughts about the activity rather than the activity itself. This was done because the meaning difference between finite and non-finite utterances does not so much concern the activity in itself, but rather what the speaker thinks about the activity. Picture A, the assertion picture, depicts B and the fact that she thinks about Peter constructing a table (as represented in the thought balloon). As there is no sign in the picture that B doubts about this activity taking place, this picture is expected to be chosen when hearers interpret B's answer as making the claim that this is true. On picture O, the open picture, B doubts whether the constructing of a table indeed takes place. Depicting doubt about an activity is hardly possible without depicting at least part of that activity. Therefore, all the elements necessary for the performance of the activity are depicted in the thought balloon of the open picture, but, in contrast to the assertion picture, the performance of the activity itself is not depicted. In addition, there is a question mark above B's head. This picture is compatible with an interpretation of an utterance as expressing doubt about whether the expressed state of affairs holds at the relevant time span. However, it is not necessarily the case that because one doubts about whether something is happening, one could not think about it as happening. Inevitably, a picture on which B thinks about an activity being performed, as the assertion picture, is therefore always compatible with both an 'assertion' and a 'doubt' interpretation. In sum, while the assertion picture is compatible with both an 'assertion' interpretation and a 'doubt' interpretation, the open picture is only compatible with a 'doubt' interpretation. If two utterances differ in whether they make an assertion or not, this should therefore lead to more choices of the open picture for the utterance that does not make an assertion, but not necessarily to this picture being chosen in all cases for this utterance type. On the distractor picture (picture C), the activity is depicted as completed. It was assumed that both the finite and the non-finite utterance do not match this picture, as even the non-finite utterance is marked for non-completedness. This is the case because infinite forms as *bauen* contrast with the likewise infinitival past participle *gebaut*, such that *bauen* is specified as 'not-completed' and *gebaut* as 'completed' (Hoekstra and Hyams, 1998).

Finally, it seemed important to give participants utterances which matched the open or the completed picture, in order to prevent any bias for these pictures for the non-finite utterances. For this reason, two additional control conditions were included. In one of these conditions, speaker B explicitly states that she does not know whether the activity under consideration takes place. Utterances were of the type *Ich weiß nicht, ob Peter einen Tisch baut* ('I don't know whether Peter constructs a table'). This was expected to lead to choices of the open picture. The other control condition included the use of an auxiliary

construction which suggests completion - the perfect.[6] Utterances in this condition were of the type *Peter hat einen Tisch gebaut* ('Peter has constructed a table'), and were expected to lead to choices of the completed picture. In the following, information about the participants as well as an overview of all materials and the procedure of the experiment is given.

2. Method

2.1 Participants

Participants were 46 adult native speakers of Turkish (29 female, 17 male) and 18 native speakers of German (10 female, 8 male). All of the learners had previously participated in the tasks described in the preceding two chapters. More information about the learners can be found in appendix A.[7] The native speakers of German had a level of education comparable to that of the learners and very little knowledge of foreign languages. The average age in the control group was 41.5 years.

Production measures

As in the previous chapters, the retellings of the finite story (Dimroth, 2005) and of the auxiliary stories (Verhagen, 2005) were used to assess learners' production. Following Verhagen (2005)[8], learners were classified in a group not producing auxiliaries (no-aux group, n=22) and a group in which each learner produced at least one instance of the auxiliary *haben* (aux group, n=24). Moreover, it was also assessed whether and how frequently learners used the two utterance types presented in the experiment, that is, third person singular utterances containing a finite or non-finite lexical main verb and a verb complement. To this end, all third person singular present tense utterances containing a lexical main verb ending in *-t* or *-en* and a complement were selected from the transcripts.[9]

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[6] There is a vivid discussion on the precise analysis of the German (and similarly the Dutch) perfect, as in *Er hat angerufen/hij heeft gebellt*, lit. 'he has called' (see, e.g., Klein, 2000; Thieroff, 1992). In contrast to the English present perfect, it can combine with past tense adverbials, and it is often used in contexts in which English would use the simple past. It is not possible to go into this discussion here. In the test sentences, what is important is only whether the action shown on the picture is interpreted as being over, as 'completed', when the sentence is interpreted.

[7] The learners of German who participated in the picture selection task had been living in Germany for nine years on average, the average age was 33.3 years and they had received on average 5.4 months of language teaching in German.

[8] In Verhagen (1995), learners are classified into two groups according to whether they produce the auxiliary *hebben* or not, and it was found that only the so-called aux group, in which *hebben* is used, shows knowledge of verb raising for lexical verbs in Dutch. This finding supports the hypothesis tested in the present paper that the acquisition of auxiliaries constitutes a turning point in the acquisition process.

[9] The selection was restricted to utterances containing a complement because these utterances are directly comparable to those presented in the experiment. It has been shown that how frequently learners put the verb in a 'finite' position in an utterance depends on type of other elements in that utterance. For example, first and second language learners have been shown to acquire verb raising earlier with negation than with the focus particle *auch* (Dimroth, to appear). Note also that imitations of utterances of the experimenter, self-corrected utterances as well

Learners used both finite and non-finite utterances. In most cases, morphologically finite utterances (utterances in which the verb ended in *-t*) were also syntactically finite (the verb appeared in second position), and non-finite verbs were mostly placed clause-finally. However, there were also utterances in which morphological and syntactic finiteness did not go together. Examples of all four utterance types are given in (10) to (13), all taken from retellings of a scene in which one person (Mr. Blue) knocks at the door of another protagonist of the film (Mr. Red):

(10) *verb ending in -t , second position:*
herr blau klingt äh schlägt noch herrn rots tür
Mr. blue $ring_{FIN}$ ehm hit_{FIN} still Mr. red's door

(11) *verb ending in -en, final position:*
blau tür klopfen
blue door $knock_{INF}$

(12) *verb ending in -t , final position:*
herrn rots tür schlägt
Mr. red's door hit_{FIN}

(13) *verb ending in -en , second position:*
schlagen der tür
hit_{INF} the door

The distribution of these four utterance types in the two groups is displayed in Table 1.

	***-t*, second**	***-en*, final**	***-t*, final**	***-en*, second**
no-aux	26	107	10	44
aux	170	63	13	26

Table 1: The distribution of utterance types in the learner groups (absolute numbers)

These data show that all utterance types exist in both groups, even though the preference is clearly different between groups. The presence of both utterance types (1) and (2) in learners' production makes it a relevant question whether or not they are associated with a

as repetitions were excluded from the analysis, as well as utterances in which the ending was not clearly identifiable.

meaning difference in learners' comprehension. The number of occurrences of each utterance type for each learner can be found in appendix B2.1.

2.2 Materials

There were 20 different items in the task, each appearing in a dialogue as outlined above. To construct these items, seven simple and depictable activities were chosen, each involving a protagonist (e.g., 'Peter' in the example given above), an object (e.g., 'the table'), and a lexical main verb (e.g., 'construct'). Each activity occurred in three different items, each time with a different protagonist performing the activity.[10] Each item could occur in one of the six different conditions introduced above: Conditions 1 and 2 correspond to finite and non-finite utterances, as in (10) and (11) above. They are the critical conditions in the experiment in that testing for a difference between them allows for a confirmation or a rejection of the hypotheses derived above. Conditions 3 and 4 were the two trigger conditions involving rising intonation, and conditions 5 and 6 were the control conditions which gave participants the opportunity to take the open and the completed picture respectively. An overview of all items and conditions is given in appendix C2.

Items were pre-recorded: A male native speaker of German read out the questions, and a female native speaker of German read out the answers in the different conditions. For each item, three types of pictures as in the example presented above were created. One of the six possible orders of the three pictures was then chosen for each item and kept, no matter in which condition the item appeared, so that differences between conditions could not be due to a different order of the pictures and so that overall, each order appeared equally often in the experiment.[11] In addition to the experimental items, six warm-up items were created that were used to familiarize participants with the task. In the warm-up trials, speaker A asked *An wen denkst du?* ("Who are you thinking of?"), and speaker B answered by giving the name of one of the three protagonists occurring in the items. The series of pictures used for the warm-up trials displayed B thinking of one of the protagonists on each picture. Note that the warm-up trials did not make use of a verb in order to avoid any training effect for the verb-containing utterances in the experimental trials.

2.3 Procedure

Six different experimental lists were created, so that each item appeared in another condition in each of the lists. As the trigger conditions 3 and 4 are expected to influence the interpretation of conditions 1 and 2, the different conditions appeared in a pseudo-random

[10] The activity 'to take a bath' occurred only with two different protagonists, because only 20 and not 21 items were needed.

[11] Again, there were two orders (132 and 231) which appeared four and not three times to reach the number of 20 items.

order, in which there always was a trigger condition within the three items preceding each critical condition.[12] To control for an effect of the order of the items (as opposed to the order of conditions), an additional version was made of every list which started with the second half of the same list and administered to half of the participants.

The experiment was run on a laptop computer. Participants saw the pictures on the screen, heard the dialogues via headphones, and could indicate their choices by pressing buttons on a button box. The experimenter was present during the whole experiment, but could not hear the dialogues. Before the experiment started, the experimenter showed a picture of the three possible protagonists occurring in the dialogues to the participant and indicated their names. The experimenter then gave the following instruction to the participants (in German):[13]

> *You are going to hear a question and an answer to that question. Please decide what is meant with that answer by choosing one of the three pictures. In the beginning, the pictures and the sentences will be very easy, they get more complicated later on. Please think carefully about what the woman on the pictures wants to say, and look at the pictures carefully to choose the right one!*

Participants could then start the experiment by pressing any button. This started the six warm-up trials. During each trial, participants heard the question of speaker A (who was not depicted on the pictures), and then an answer of speaker B (who was depicted). They listened to this dialogue and then indicated their choice of a picture by pressing a button that was labeled with the same number as the picture in question. If they were unsure of their answer, participants could listen again to the dialogue as often as they wanted, and the experiment only continued when they had chosen a picture. During the warm-up trials, the experimenter repeated the above instruction or gave further explanations when participants had difficulties in understanding. If they had any questions after the warm-up trials, these were answered, and they then went through the twenty experimental trials in the same way as in the warm-up trials. Again, they could listen to utterances several times and the experimenter encouraged them to think about the meaning of each utterance, but gave no further indications as to what this meaning might be. No further explanations were given concerning the pictures either.

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[12] Note that conditions 1, 2, 5 and 6 appeared 4 times in each list, whereas the trigger conditions appeared only twice each. This was done in order to limit the overall length of the experiment and the number of trials which are presumably hard to interpret (conditions 2, 3 and 4, occurring in 8 trials all together) compared to trials in which the interpretation should be straightforward (conditions 1, 5 and 6, occurring 12 times all together). This unequal number does not present a problem for the analysis, as predictions only concerned the critical conditions 1 and 2 and only those were directly compared to each other.

[13] The instruction was given in a spoken form in German. If the Turkish participants showed problems of understanding, they could also read a written Turkish version of the instruction.

3. Results

An overview of the number of choices of each picture in each condition in the three different groups is given in appendix E.1.[14]

3.1 Trigger and control conditions

The results for the trigger conditions 3 and 4 (in which finite and non-finite utterances were presented with a rising intonation contour) show that participants indeed chose the open picture relatively frequently for these utterance types (between 20 and 56 percent of the time). Recall that it is not expected that the open picture is always chosen when an utterance expresses doubt, because the assertion picture is also compatible with this interpretation. The observed number of choices of the open picture therefore seems sufficient to suggest that these conditions indeed enhanced the availability of a 'doubt' interpretation. The results for the control conditions 5 and 6 reveal that in general, the pictures were interpreted as anticipated: In participants of all groups, the open picture was chosen more frequently than the other two pictures when an utterance in condition 5 (the 'doubt' condition) was presented, indicating that it matches well the expression of doubt. The completed picture was chosen in the majority of cases in which the utterance contained the perfect (condition 6) in the aux group and the native speaker group. This is not true for the no-aux group. This is probably not due to a misinterpretation of the picture, but to a failure to understand the aspectual meaning of the auxiliary in condition 6. This is not surprising, given that auxiliaries are not yet produced in this group.

3.2 The interpretation of finite versus non-finite utterances

The hypothesis to be tested concerns the contrast between finite and non-finite utterances. Whereas these two utterance types should not lead to different interpretations in the no-aux group, finite utterances should more often be interpreted as making an assertion than non-finite ones by the other two groups. This should be visible in a difference in preferences for the assertion and the open picture: The proportion of choices of the assertion picture compared to the open picture should be higher in the finite than in the non-finite condition. The distractor picture was not expected to be chosen to a different degree in the two conditions. The choices of the three pictures in conditions 1 (finite utterance) and 2 (non-finite utterance) for all three groups of participants are displayed in Figure 2.

[14] Note that 6 cases had to be excluded in the native speaker group because there was an error on one of the pictures: The question mark appeared on the assertion instead of the open picture.

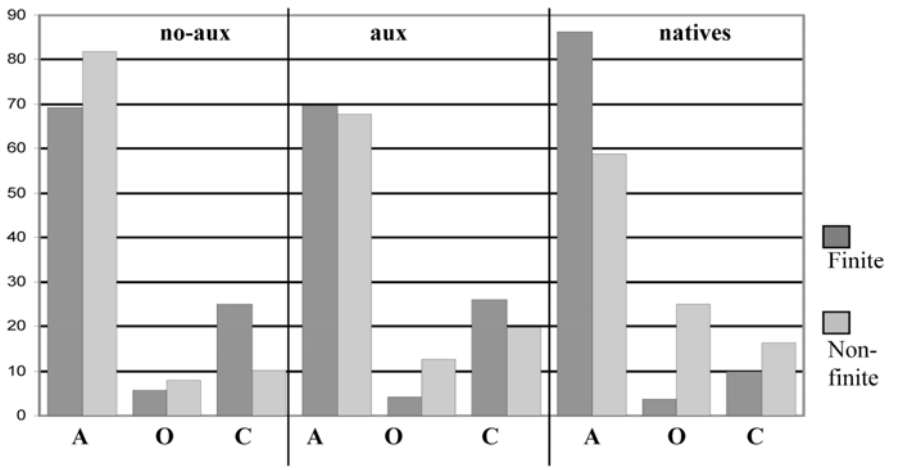

Figure 2: Choices of each of the three pictures in percentage of all trials of each condition. A = assertion picture, O = open picture, C = completed picture.

Whereas a difference between the conditions is only predicted for the assertion and the open picture, the results show that the completed picture is also chosen to different degrees in the two conditions, in particular in the no-aux group. To test whether this effect is significant, logit mixed-effect models with subjects and items as random factors, condition as the predictor of interest, and picture C (whether the completed picture was chosen or not) as the dependent variable were used for every group separately using the statistical software R (R development core team, 2008, see Bates and Sakar, 2007 and Jaeger, 2008, for the analysis used). That is, it was tested for every group whether the condition (whether the stimulus sentence was finite or non-finite) had a significant influence on whether the distractor picture was chosen or not. The analysis revealed that the condition significantly influenced the number of choices in the no-aux group (wald $z = 2.82$, $p < 0.01$). This effect is due to the no-aux group choosing the completed picture more often for finite than for non-finite utterances. In the two other groups, there was no effect of condition on the choices of the distractor picture (wald $z = 1.16$, ns for the aux group and wald $z = 0.83$, ns for the native speaker group).

Subsequently, the analysis was repeated for every group with the same predictors and picture A vs. O (whether the assertion or the open picture was chosen) as the dependent variable. For this analysis, only those trials were taken into account in which either the assertion picture or the open picture was chosen. When only those trials are considered, the assertion picture was chosen in the majority of cases in both conditions in all three groups, but this preference was stronger for finite than for non-finite utterances. This pattern of preferences is depicted in Figure 3.

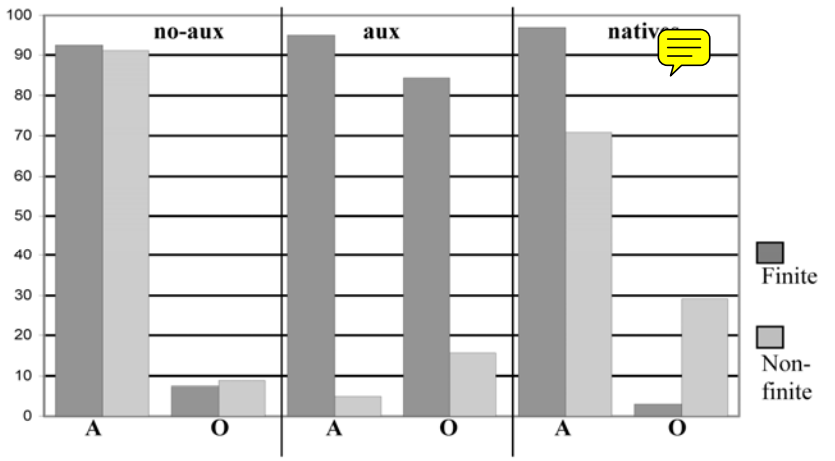

Figure 3: Choices of the assertion picture (A) and the open picture (O) in percentage of all trials in which one of these two was chosen.

The condition significantly influenced the pattern of choices in the aux group (wald $z = 2.01$, $p < 0.05$) and in the native speakers group (wald $z = 3.54$, $p < 0.001$), but it was not a significant predictor in the no-aux group (wald $z = 0.28$, ns).

The relatively small effect found in the aux group raises the question whether there are subgroups in this group that have different preferences. As shown in appendix B2.2, the learners in the aux group differ strongly in how often they used finite and non-finite utterances of the type tested in the experiment in the production task. There are two learners who did not use a single finite utterance containing a lexical main verb and a verb complement, whereas others exclusively used utterances of this type (out of the four utterances types investigated here). It might be that a change in the interpretation of finite and non-finite utterances only takes place when the use of finiteness has become systematic, and that the effect in the aux group is therefore carried exclusively by a more advanced sub-group within this group. To test whether this is the case, the percentage of finite utterances out of all four relevant utterance types was added as a covariate to the model for the aux group. That is, the question of whether the percentage of finite utterances contributed to predicting the choices of the assertion versus the open picture in addition to the influence of the condition was tested. The analysis revealed that this covariate had no significant influence (wald $z = 0.89$, ns).

4. Discussion

The results are first discussed separately for the three groups of participants. In the final paragraph, the results of all groups are taken together and it is discussed which conclusions

concerning the changing interpretation of finite and non-finite utterances during the course of acquisition are suggested by these results.

4.1 Native speakers

Native speakers chose the assertion picture more often for finite than for non-finite utterances, and the open picture more often for non-finite than for finite utterances. This is in line with the predictions and supports the assumption that finiteness marks assertion.
However, the results also reveal that the assertion picture was still the preferred picture even for non-finite utterances. These choices of the assertion picture are presumably due to the fact that this picture is also compatible with the interpretation that speaker B doubts about the performance of the activity under consideration. This is reflected by the fact that the assertion picture was chosen in 30 percent of the cases even for utterances appearing in condition 5 (of the type "I don't know whether Peter constructs a table"), which unambiguously express doubt. In addition to that, some of the choices of the assertion picture in the non-finite condition might also be due to participants having failed to draw the pragmatic implicature that the absence of assertion indicates the expression of doubt in the discourse context as it was set up in the experiment.

As for the cases in which native speakers chose the open picture for non-finite utterances, it seems likely that speakers have indeed drawn this implicature. The choices of the open picture are compatible with the assumption that native speakers interpret the absence of finiteness as possibly expressing doubt. It has to be noted, however, that there are alternative explanations for these choices. This is because non-finite utterances are not only unspecified for assertion, but also for other aspects of sentence meaning that are usually expressed by the form and position of finite verbs, such as modality and sentence mode. The non-finite utterance might therefore not only be interpretable as an expression of doubt, but also of a certain modality, such as a *wish* or an *obligation*, or of a non-declarative sentence mode, such as a *question*. In addition, whereas the open picture was designed to express doubt about whether an activity takes place, it might well be interpreted as depicting a modal, interrogative or imperative meaning. One can imagine that the protagonist *wants* to complete the activity on this picture, as it is clear that its performance has not yet started. It is also conceivable to interpret the picture such that speaker B thinks that the protagonist *should* or *must* perform the action. As for other sentence modes, one could imagine that on the open picture, speaker B *asks* whether the activity under consideration is taking place, or that she wants to give the protagonist the *order* to perform the activity. Therefore, these interpretations of non-finite utterances can also explain the pattern of results. The fact that it is hard to pin down the exact interpretation that participants made of the non-finite utterance is unavoidable because of the unspecified nature of this utterance type. What is more important than the exact interpretation is the fact

that this utterance type is significantly less often matched on the assertion picture than finite utterances, showing that, as predicted, the finite utterance type is more compatible with an assertion interpretation for native speakers than the non-finite utterance type.

These results for the native speaker group set a point of comparison for the analysis of the learner data: Choosing the open picture in about a quarter of the cases for non-finite utterances, and the assertion picture in about 87 percent of the cases for finite utterances[15], can be taken as a native-like understanding of finiteness as far as it can be measured in the present task.

4.2 No-aux group

Beginning learners show a pattern of results that is very different from native speakers: They almost never chose the open picture, neither for finite, nor for non-finite utterances. The preferred picture for both utterance types was the assertion picture, which was chosen even more often for non-finite than for finite utterances. Finally, the distractor picture, on which the activity was depicted as completed, was significantly more often chosen for finite than for non-finite utterances.

A misanalysis of the present tense third person singular agreement morpheme *-t* as a marker of completed aspect has been reported before for German child language by Tracy (1991) and Behrens (1993). Apparently, the present learner group makes the same misanalysis: For at least some learners in this group, the finite form is understood as expressing that the activity under consideration is completed.[16] This is not the case for the non-finite utterance, which was rarely associated with the completed picture in this group. This finding is interesting because it reveals that learners perceive the difference between the two forms, even though they predominantly produce the non-finite form.

With respect to the main research question of this study however, one might wonder whether the misanalysis of *-t* as an aspectual marker might have hidden a difference in assertion marking between the two utterance types: It cannot be excluded that learners would have chosen the assertion picture for the finite utterance more often, if they had not

[15] There is no obvious explanation for why the finite utterance is not matched with the assertion picture in all cases by the native speakers. In the remaining about 13%, it is more often matched with the completed picture (about 10% of the cases) than with the open picture. This indicates that this picture might not be completely incompatible with an 'ongoing' interpretation of the utterance: One can imagine that a sentence of the type *Peter baut einen Tisch* is still an acceptable description of a picture of Peter and a constructed table. Obviously, the assertion picture is a better match with that utterance type, but it is possible that participants did not always pay attention to the differences between the pictures in all trials, so that they sometimes might have chosen just one fitting picture instead of *the most* fitting picture. Note that this can clearly not explain all choices of the completed picture in the learner groups, as their number is too substantial. Moreover, the difference to the non-finite utterance in the no-aux group, which is not matched with the completed picture, would remain unexplained when taking this approach.

[16] To my knowledge, the interpretation of the agreement morpheme *-t* as marking completed aspect has not been reported before for second language learners of German. This interpretation is most likely caused by the fact that past participles also end in *-t*. It is interesting that the overgeneralization to all forms ending in *-t* persists even after learners have acquired auxiliaries.

had the opportunity to choose the completed picture instead. However, even if all the choices of the completed picture in the finite condition had been choices of the assertion picture, there would still be no clear difference between finite and non-finite utterances with respect to the assertion picture. This is the case because in the present data, the assertion picture is chosen even more often for non-finite than for finite utterances. The overall pattern in the data therefore strongly suggests that learners who have not yet acquired auxiliaries make no difference in assertion marking between finite and non-finite utterances. This is in line with the predictions and the model proposed by Dimroth et al. (2003).

4.3 Aux group

Learners who have acquired auxiliaries behaved differently from learners who have not yet acquired auxiliaries. Finite utterances were more often matched with the assertion picture than non-finite utterances, whereas non-finite utterances were more often matched with the open picture than finite utterances. This pattern of results is in line with the predictions and supports the assumption that the acquisition of the auxiliary system leads to a change in the interpretation of finiteness. Moreover, no evidence was found that further developments apart from the acquisition of auxiliaries are necessary to establish the effect, as the proportion of finite utterances could not be shown to contribute to the effect.

However, several elements in the data in the aux group make it necessary to attenuate these conclusions. First, whereas learners' proficiency in production other than the acquisition of auxiliaries was not shown to influence the interpretation of finiteness, that such an influence exists cannot be excluded on the basis of the present data. The effect that was found in the aux group is so small overall that not all learners in this group can have contributed to it. It is not surprising that it is difficult to detect systematic influences on such an unstable pattern. Further research is desirable in which the impact of the acquisition of the auxiliary system should be disentangled from the impact of other developments in proficiency by using more sensitive measures.

More importantly for the present study, the small size of the effect casts doubt on whether it is justified to conclude that the learners in the aux group have a native-like understanding of finiteness. On the one hand, one might argue that there is more evidence for an association of finiteness and assertion in this group than is visible on first sight. This can be argued because the presence of the completed distractor picture has the potential to blur the expected pattern of results, as was discussed for the no-aux group above. In the aux group, the distractor picture was chosen in 26 percent of the cases when a finite utterance was presented, suggesting that a misanalysis of the *-t* morpheme is also widespread in this group. The distractor picture might therefore have attracted finite utterances away from the assertion picture, so that a difference in the choices of this picture between finite and non-

finite utterances that might otherwise have appeared was not detectable. Given these results, one may wonder whether the pattern of results might have looked more native-like if the distractor picture had not been presented.

On the other hand, it is unclear what choices would have been made for the non-finite utterance if the distractor picture had not been presented. If all the choices of the completed picture had been choices of the assertion picture, this would again result in a non-native-like pattern. If they had been choices of the open picture, this would result in a more native-like pattern. The second possibility seems more likely, because the fact that learners in the aux group chose the completed picture for non-finite utterances to a considerable degree at all can be taken as an indication that they hesitated in matching this utterance with the assertion picture. At least, this seems to be a more plausible explanation than assuming that choices of the completed picture are due to an understanding of the non-finite utterance as being marked specifically for completed aspect. Learners in this group might interpret the non-finite utterance as being unspecified both with respect to assertion and with respect to aspect. The latter suggests that these learners have not yet learned the opposition between infinitival forms marked as completed (past participles) and infinitival forms for which this is not the case, as the ones tested in the present experiment.

All in all, the results therefore suggest that learners in the aux group differ from native speakers in their knowledge about how completion is marked. However, they seem to be similar to native speakers in making an association between finiteness and assertion, as suggested by Dimroth et al. (2003). Whereas in the no-aux group, the non-finite utterance is interpreted as at least as suitable as the finite utterance for marking assertions, this is not longer the case in the aux group. This conclusion is discussed in more detail in the following final paragraph.

4.4 The development in the interpretation of finite and non-finite utterances

In the following, the question of how far the present data can be reconciled with suggestions in the literature about the development in the interpretation of finite and non-finite forms is discussed.

As for the interpretation of finite utterances, they are clearly understood as one possible way of making an assertion in all three groups. At least for part of the learners of both groups, finite utterances can in addition be understood as meaning that an activity is completed (at least for third person singular utterances investigated here). This does not contradict the association of finiteness and assertion marking, however, as the aspectual distinction is a more specific one and the expression of completed as well as ongoing aspect presupposes an underlying assertion. This interpretation of finite utterances as making assertions is not surprising on any account of language development. In particular, it is also expected according to the model in Dimroth et al. (2003) that was tested in the present

study. According to this model, finite utterances are interpreted as assertions by beginning learners because for them, every juxtaposition of a topic and a predicate constitutes an assertion by default. In contrast, for more advanced learners and native speakers, the presence of finiteness marking contributes to the interpretation of finite utterances as assertions.

As for the interpretation of non-finite utterances, there is an extensive debate in the literature on this topic. A common suggestion is that non-finite utterances are used by learners in order to express a modal meaning (Ingram and Thompson, 1993 for German, see also Hoekstra and Jordens, 1994 and Wijnen, 1996 for Dutch and Meisel, 1990 and Ferdinand, 1996 for French child language). Researchers differ in the explanations they give for this effect (see Hoekstra and Hyams, 1998, and Blom, 2007, for overviews), but very often, they point out that the origin of non-finite utterances such as (9b) (taken from above) in learner language might be modal sentences such as (9c):

(9b) Peter einen Tisch bauen
Peter a table construct$_{INF}$

(9c) Peter will einen Tisch bauen
Peter want$_{FIN}$ a table construct$_{INF}$

The proposal is that children and adult learners derive utterances like (9b) in some way or another from utterances in the input that have the form of (9c). As these input utterances have a modal meaning, learners may come to associate this meaning with the infinitival form of the lexical verb (rather than with the modal verb) and subsequently use infinitives to express modal meanings. One might wonder whether this was also the reason for the choices of the open picture for non-finite utterances in the present experiment. As shown above, this picture might be understood as expressing a modal meaning. However, the data speak against the idea that learners in particular associate non-finite utterances with modality. If this were the case, the open picture should have been chosen more often in the learner groups than in the native speaker group, as infinitival main verbs are not a common way of expressing modality for the native speakers. However, the reverse pattern was found: Learners associate non-finite utterances more often with simple assertion and less often with a potential modal interpretation than native speakers do.

A related proposal in the literature is that learners only come to associate modality with non-finite forms when they have acquired finite forms. The idea of this proposal is that non-finite forms function as default or 'elsewhere forms' in early learner language (Ferdinand, 1996; Prévost and White, 2000) and can be used to express different meanings. As soon as the more specific finite forms replace the non-finite forms in their

function of expressing simple present tense declarative sentences, the meaning that is left for non-finite forms would then be that of expressing modality (Blom, 2003). This proposal is not supported by the present data either. It does not seem to be the case that the more advanced learners in the aux group necessarily associate modality with non-finite utterances. This would have predicted more choices of the open picture, and fewer choices of the completed picture in the aux group. In contrast to this prediction, learners in this group chose both of these pictures more-or-less equally often, suggesting that they did not achieve the mapping of any specific meaning (from the ones presented on the pictures) on the non-finite form.

The most convincing interpretation of the data thus seems to be that learners change their preference for simple declarative utterances from non-finite forms (as preferred in the no-aux group) to finite forms (as preferred in the aux group). This is compatible with the idea that learners come to understand the association of finiteness and assertion marking. They then do not know, however, how to interpret a non-finite form. Most likely, they perceive this form as being compatible with different meanings, and even with completion, as reflected in the choices of the completed picture. Finally, in the native speakers, the non-finite form is more often mapped on the open picture than on the completed picture. This can be explained by the assumption that infinitival forms that are not past participles are considered to be marked for non-completedness by native speakers, and that for native speakers, the meaning of the non-finite form therefore corresponds better to the open picture.

In sum, there is a connection between finiteness and assertion for native speakers of German and for learners using auxiliaries, but not for learners who do not yet use auxiliaries. The following chapter investigates whether a similar pattern of results can be obtained for native speakers and learners of French.

Assertion marking and finite and non-finite verbs in production and comprehension: A comparison between Turkish learners of German and Turkish learners of French

Chapter 5

Abstract

In this chapter, it is investigated whether observations that have been made for the acquisition of finiteness in Germanic languages can also be made for the acquisition of French. As shown in the previous chapter, there is a change in the interpretation of finite and non-finite utterances in learners of German that coincides with the acquisition of the auxiliary system. It has been argued that this reflects a change in how assertion is marked according to the learners' grammar (Dimroth et al., 2003). The present chapter investigates the production and comprehension of simple declarative utterances in Turkish learners of French before and after the acquisition of auxiliaries, in order to test whether a similar development can be found. It is concluded that this is not the case: Finite and non-finite utterances do not differ in assertion for these learners at different stages of the acquisition process. The chapter concludes with a discussion of the potential causes and consequences of this cross-linguistic difference.

1. Introduction

As discussed in the previous chapters, finiteness is used by native speakers for a variety of functions. In the languages investigated here, German and French, finite verb forms carry temporal, aspectual and modal meanings, and express the relation between the subject and the verb by being marked for person and number. Moreover, the position of the finite verb contributes to marking an utterance as declarative, interrogative or imperative. Finally and most importantly in the current context, a finite verb form introduces an assertion operator into the utterance, linking the sentence base to the topic situation (Klein, 1998, 2006).

In early (adult) learner language, finite verb forms are not used in this target-like way. The properties of verbs that play a role for utterance structure are not related to finiteness. It has been claimed that the change from a non-finite to a finite system leads to a major restructuring of the learner system:

> Second language learners, just as first language learners, clearly distinguish between 'infinite utterance organisation' and 'finite utterance organisation'. Thus, the evidence from language acquisition, first and second, supports the notion that finiteness is not just tense or mood, let alone a mere matter of inflection - it is a major organising factor in the structure of utterances. (Klein, 2006: 5)

This reorganization of the structure of learner utterances has been described in detail by Dimroth et al. (2003) for Germanic languages. Dimroth et al. (2003) show that the learner system undergoes a crucial change when learners start to use finiteness marking on lexical main verbs to mark assertions, as opposed to relying only on word order and lexical assertion markers. Furthermore, they claim that the acquisition of auxiliaries plays a triggering role in this change of the system.

The aim of the current study is to investigate whether a similar process can be observed in the acquisition of French. Finiteness is used in native French in a comparable way as in German, that is, the forms and the placement of the finite verb convey very similar meanings, and in particular, they carry assertion in both languages. However, as will be illustrated throughout the chapter, French and German differ in other properties, in particular, the word order in subordinate clauses, the headedness of the VP, and the richness of the agreement paradigm. These differences might make the acquisition of finiteness more difficult for learners of the one language than the other, and ultimately lead to a different path of acquisition. In the remainder of this introduction, the results of the previous chapter as well as results from studies on the untutored acquisition of French as a second language are briefly summarized. Subsequently, evidence for L2 French is presented from the same production and comprehension tasks as used in the preceding chapter. It is shown that in French, there is no evidence for a change from a non-finite to a

finite system of assertion marking. Throughout the range of proficiency investigated in the present study, finite lexical verb forms are used more frequently than non-finite lexical verb forms, and the proportion of finite and non-finite utterances does not change at different stages of acquisition as defined by the use of auxiliaries. Moreover, learners of all proficiency levels associate assertion with finite as well as with non-finite forms. The chapter ends with a discussion of the possible causes and consequences of this cross-linguistic difference.

In the preceding chapter, both production and comprehension evidence was presented that point to a difference in assertion marking between learners of German who have and learners of German who have not yet acquired auxiliaries. Learners who do not yet use auxiliaries mainly use non-finite lexical verbs in their production, whereas in the production of learners who use auxiliaries, finite verbs prevail. There is thus a clear shift in the acquisition of German from utterances of type (1) being the default type of assertion marking utterances, to only utterances of type (2) being clearly associated with assertion:

(1) Peter einen Tisch bauen

(2) Peter baut einen Tisch

If the acquisition of finiteness proceeds in a similar way in French, there should be a parallel shift from a predominance of utterances of type (3) to utterances of type (4):

(3) Pierre construire une table
Peter construct$_{INF}$ a table

(4) Pierre construit une table
Peter construct$_{FIN}$ a table

Whereas in German, finite and non-finite clauses differ in the surface position of the verb and in its morphological marking, only morphological differences are visible in French for the type of sentences investigated here, due to the different headedness of the VP.[1] Previous studies on the (untutored) acquisition of French verbal morphology (Becker and Veenstra, 2003; Noyau et al., 1995; Perdue, Deulofeu and Trévise, 1992; Starren, 2001) have not come to clear conclusions as to whether there is a general trend from non-finite to

[1] For this reason, only morphology is discussed in the following. Note however that the results for negated utterances presented in chapters 2 and 3 suggest that learners of French do not go through a clear transition from a preference for non-finite to a preference for finite positions, as do learners of German. In contrast, they seem to acquire the use of a raised position very early in the acquisition process. This parallels the observation concerning morphology reported in the following.

finite forms. The agreement paradigm in spoken French is opaque (see chapter 3), and learners have been reported, as far as verb endings are concerned (verb 'prefixes' are briefly discussed below), to mainly extract two different forms for each verb from the input: a form consisting only of the bare stem, and 'long forms' of verbs, which for most verbs end in -/e/ (Becker and Veenstra, 2003; Noyau et al., 1995; Starren, 2001). For irregular verbs, it has been reported that learners also use other long forms, in particular forms ending in -/i/ (Becker and Veenstra, 2003). The bare stem corresponds to the correct finite form in most contexts, whereas the 'long forms' can be assumed to be modeled after non-finite forms in the input. While learners sometimes map different meanings on these two different types of forms, there seem to be strong individual differences in what these meanings are (Noyau et al., 1995; Perdue et al., 1992; Starren, 2001), as well as instability within the system of a given learner. In the present context, it is important to know whether the frequency of the two forms as main verbs in simple declarative utterances changes over time. If a development from a non-finite to a finite system exists in French, the proportion of finite forms used as main verbs should be higher in more advanced when compared to less advanced learners. Clearly, the proportion of finite forms must outweigh that of non-finite forms at a certain stage in development, as there are obviously very proficient second language learners of French who do not overuse non-finite verbs as main verbs at all. However, in the available studies on the *untutored* acquisition of French as a second language (Becker and Veenstra, 2003; Noyau et al., 1995; Perdue et al., 1992; Starren, 2001), there are little indications as to how and when in the acquisition process a clearly 'finite' stage is reached. In these studies, it is usually reported that learners continue to use long and short forms interchangeably for an extended period of development (see in particular Becker and Veenstra, 2003). However, the available studies do not further quantify the ratio of finite and non-finite main verbs at different stages of the acquisition process, so that the question of whether there is a clear change in the use of these two types of forms at some point in development needs further investigation.

Based on the results of the previous chapter, one might predict that if learners come to understand the association of finiteness and assertion marking at some point in the acquisition process, they should be more reluctant to use clearly infinitival main verbs from that point on. In comprehension, they should hesitate in interpreting utterances with such main verbs as assertions. Furthermore, if the function of finiteness is made transparent to the learners of French by the acquisition of auxiliaries, as it has been shown to be the case for learners of Germanic languages, the turning point in the use and interpretation of finite and non-finite lexical verbs should fall together with the acquisition of auxiliaries. These two assumptions are investigated in the following. The research questions can be summarized as follows:

1) Do learners of French who do not use auxiliaries produce a higher proportion of non-finite lexical main verbs than learners of French who use auxiliaries?

2) Do learners of French who do not use auxiliaries interpret non-finite forms more or equally often as marking an assertion than finite forms, whereas learners of French who use auxiliaries interpret finite forms more often as marking assertions than non-finite forms?

2. The current study

2.1 Participants

Participants were 41 adult native speakers of Turkish (17 female, 14 male) and 18 native speakers of French (11 female, 7 male). All of the learners had previously participated in the tasks described in chapters 2 and 3.[2] More information about the learners can be found in appendix A. The native speakers of French had a level of education comparable to that of the learners and very little knowledge of foreign languages. The average age in the control group was 31.5 years.

2.2 Production

The elicitation materials used were identical to the materials used for the learners of German (see previous chapter), and as in the analysis of the data for German, only third person singular contexts were taken into account.[3] The learners in the current study therefore had a comparable number of 'opportunities' to produce auxiliaries and finite and non-finite lexical main verb utterances, in the same contexts as the learners of German. The results for the acquisition of auxiliaries (and light verbs in general) and the presumably related acquisition of finite and non-finite lexical main verbs are presented in the following two sections.

[2] As can be seen in appendix A2, two more learners originally completed the picture selection task. For one of these learners, the recording of the auxiliary stories was corrupted, and for the other, this retelling could not be obtained. As these learners did not use more than one auxiliary in the finite story, it was unclear in which group they should be placed in absence of data from the auxiliary stories. The production and picture selection data from these two learners were therefore not included in the analysis reported below. The remaining 41 learners had been living in France for eight years and three months on average, the average age was 34 years and they had received on average 9 months of language teaching in French.

[3] In French, it would be particularly interesting to also look at other contexts as they might give evidence as to whether light verbs are used as unanalyzed chunks or inflected productively in different contexts (see below). However, the elicitation materials used here provided a too low number of other contexts to investigate this question systematically.

2.2.1 Light verbs

The learners of French tested here have a similar learner profile as the learners of German in terms of length of residence and exposure to the target language (see appendix A). However, there are striking differences in how often they used which types of verb forms.

In particular, the frequency of auxiliaries and other light verbs was much higher in the production of the learners of French than in the learners of German. This also held for uses of *avoir* as an auxiliary. It is, however, particularly hard to judge in French whether all uses of auxiliaries are productive: Learners of French have been reported to take over unanalyzed clusters of forms from the pre-verbal complex, in which not only auxiliaries, but also the preverbal negator *ne* as well as subject and object pronouns accumulate (see Perdue et al., 1992, for a more detailed discussion of this fact and its potential consequences). Therefore, it cannot be concluded with certainty whether all observed uses of auxiliaries are productive. To investigate the use of auxiliaries in a fine-grained way, data are presented separately in the following for learners who produced no auxiliary *avoir* in the third person singular contexts at all (n = 10), learners who produced this auxiliary only once (n = 10), and learners who produced more than two auxiliaries (n = 21). By making an intermediate group of 'one-auxiliary users', the two other groups should consist of relatively clear cases of 'no-auxiliary' and 'auxiliary users'. Note that this still leaves open whether and how these learners analyze auxiliaries. This is discussed below.

Table 1 provides quantitative evidence for the claim that light verb constructions are more widespread relative to constructions with lexical main verbs in the data of the learners of French when compared to the learners of German. It provides an overview of the total number of lexical main verbs, light verbs (used in combination with lexical verbs or as only verbs), and the auxiliary *avoir* in French and in data from the learners of German which participated in the study presented in the previous chapter.

German				**French**			
	Lex verbs	**Light verbs**	**'hat' + V**		**Lex verbs**	**Light verbs**	**'a' + V**
no-aux (n = 22)	748	90	0	**no-aux (n = 10)**	222	117	0
				1-aux (n = 10)	304	199	10
aux (n = 24)	975	252	90	**aux (n = 22)**	623	492	159

Table 1: Frequency of the use of lexical main verbs versus light verbs (copula, modal verbs, presentational constructions, forms of être/sein + verb, possessive), and auxiliary avoir/haben + verb in third person singular declarative main clauses in learners of German and learners of French

The higher number of light verbs in French is due in particular to the more frequent use of presentational constructions, that is, utterances that start with *il y a* ('there is') and *c'est* ('it is'). Moreover, learners of French rely to a stronger degree than learners of German on structures that correspond to auxiliary constructions formally (*être/avoir* + verb ending in -/e/), but that do not necessarily seem to carry the aspectual and temporal meaning expressed by this structure in the target language. Examples for uses of different light verbs in the learners of French are given in (5) through (14). For forms ending in *-er*, the long form of these verbs is always transcribed as -/e/, as it is unclear whether it should be taken as the infinitival or the past participle form which can only be differentiated in writing. The meaning indicated below for each of the examples corresponds to the most plausible meaning of each utterance in its discourse context:

Presentational and other uses of light verbs as only verb form:

(5) il y a chaise son habil son veste chapeau
there is chair his clothes his jacket hat
'there is a chair with clothes, a jacket and a hat'

(6) un four il y en a gateau dedans
a stove there of it is cake in it
'there is an oven with a cake in it'

(7) il est .. il est moto ... moto
he is he is motor-bike motor-bike
'he takes the motor-bike'

Light verb constructions containing lexical verbs:

(8) il est ... je sais pas il y a couch/e/ ou il y a assi
He is I don't know there is lay down$_{INF/PP}$ or there is sit-down$_{FIN/PP}$
'he lays down or sits down'

(9) c'est elle amene sur la table
it is she bring$_{FIN}$ on the table
'she brings (the cake) to/on the table'

(10) il est reveille
he is wake-up$_{FIN}$
'he wakes up'

(11) il est... dormi
he is sleep$_{PP}$
'he is sleeping'

(12) il est habill/e/
he is dress$_{INF/PP}$
'he is getting dressed'

Auxiliary 'avoir' :

(13) maintenant chien a mang/e/
now dog has eat$_{PP/INF}$
'now the dog has eaten'

(14) il a dormi
he has sleep$_{PP}$

These utterances illustrate that for forms of *être* and for presentational constructions, there is little evidence for an analyzed use. These light verbs are combined with finite as well as non-finite lexical verb forms, and often, it is difficult to identify a meaning contribution of the light verb to the utterance. Note in particular that utterances that resemble cleft-constructions in the target language, such as utterance (9), do not seem to express any contrastive meaning, contrary to the use of these types of constructions in the target language. They rather seem to function as a neutral opening of the utterance.

All in all, these data clearly confirm the impression that light verb utterances constitute a more important proportion of all utterances in French than in German. At the same time, the examples also suggest that while learners abundantly take over light verbs from the input, they often do not use them in a target-like way. It is therefore unclear whether and how learners analyze the function of these elements and their relation to the lexical main verb. This might be particularly problematic for auxiliaries which, in contrast to German, mostly appear directly preceding the lexical verb. This position might lead learners to assume that auxiliaries are part of the inflection of the main verb and function as prefixes. Such an erroneous 'prefix-analysis' might mask the function of light verbs in the target system for the learner, and thereby also hinder a development of the notion of finiteness with respect to light verbs and the subsequent application of this notion to lexical verbs. It is hard to decide whether such 'prefix-analyses' of auxiliaries exist in the learners tested here and how widespread they are. To investigate this question, it would be useful in future studies to look at corpora in which there is not a strong dominance of third person singular contexts, as is the case in the present corpus. What can be done on the basis of the

present data is to find out whether the use of auxiliaries goes together with a change in the use of finite and non-finite lexical main verbs. If this is *not* the case, this would suggest that auxiliaries do not have the same triggering function for the development of finiteness in French as they have for learners of German. A likely cause of this difference would then be that learners of French do not analyze auxiliaries in a target-like way, in particular because they might assign a 'prefix-analysis' to them. The results concerning lexical main verbs are presented in the following paragraph.

2.2.2 Lexical main verbs

In the preceding chapter, utterances containing a lexical main verb and a complement were analyzed with respect to their finite or non-finite form. The results revealed that learners of German use both morphologically finite and non-finite verb forms in both raised and unraised positions, but that the frequency of the four different utterance types is very different overall and between the no-aux and the aux group. Table 2 presents these data once more.

	***-t*, second**	***-en/PP*, final**	***-t*, final**	***-en/PP*, second**
no-aux (n = 22)	26	127	10	47
aux (n =24)	170	97	13	31

Table 2: Frequency of different verb complement sentences in third person singular contexts (finite and non-finite lexical main verbs in raised and unraised position) in learners of German.

As for French verbs ending in *-er*, the infinitival form and the past participle are indistinguishable from each other, past participle forms have been added in the count of the non-finite forms for the learners of German, so that the data for the two languages are comparable. The same data for the three groups of learners of French are presented in Table 3 (versions of this table split up for every learner can be found in appendices B2.3 through B2.7). 'Finite' verb forms thereby refer to verbs that appear in the target-like form for third person singular present tense contexts, which is in most cases homophonous to the bare stem. 'Non-finite' forms refer to forms that correspond to infinitives or past participles. Any other verb forms occurring in the data were excluded from further analysis. Also excluded were utterances containing complements that were realized as weak object pronouns, which precede the verb in French and often are ambiguous between a pronoun and a contraction of a pronoun and a light verb.[4] Table 3 thus contains only counts of utterances that unambiguously contained a lexical main verb and full NP verb complements.

[4] 85 of these potential object-pronoun utterances occurred in the entire corpus and were excluded from the main analyses presented in the text, because they are ambiguous between light verbs and lexical verbs. Note, however, that for most of these utterances, it seems likely that they contained neither an object pronoun nor a light verbs, but

	fin, second	*non-fin*, second	*fin*, final	*non-fin*, final
no-aux (n = 10)	47	31	4	3
1 aux (n =10)	58	31	3	5
aux (n = 21)	120	81	0	0

Table 3: Frequency of different verb complement sentences in third person singular contexts (finite and non-finite lexical main verbs preceding or following the verb complement) in learners of French.

Unsurprisingly, verbs appear very rarely after the complement, even though some instances of such uses can be observed in the no-aux and 1-aux groups. The distinction between finite and non-finite utterances can thus only be made on the basis of morphology. The numbers concerning the use of finite versus non-finite lexical main verbs do not reveal any salient difference between the three groups. Numerically, the proportion of finite verbs is slightly higher in the aux group than in the 1-aux group and in the 1-aux group than in the no-aux group, but on the whole, the same pattern holds in all three groups: There is a slight preference for finite over non-finite forms. Indeed, there is no significant difference in the frequency of finite versus non-finite forms in second position for the learners of French in the no-aux group when compared to the aux group ($\chi^2(1) = 0.01$, ns). Note that in contrast, the use of finite versus non-finite utterances is significantly different in the no-aux group when compared to the aux group in German ($\chi^2(1) = 85.1$, $p < 0.001$).

It might be that tendencies are hidden in the data presented in Table 3 because verbs ending in *-er* and verbs with other endings were collapsed. Infinitival forms of verbs ending in *-er* often fall together with (finite) forms marked for past tense (forms of the *imparfait*, which end in -/ɛ/ in standard French) in the pronunciation of L2 learners. For the present sample, there is no evidence that the *imparfait* has been acquired at all: Forms ending in -/e/ are not used for reference to the past to a higher degree than bare stems. Still, their classification as 'non-finite' could be problematic because of the potential homophony

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that the form in question can best be analyzed as a meaningless verb-prefix. As an example of such a probably unanalyzed use, consider the following retelling of a scene in which a dog sees a cake on a table and eats it. Then, a person enters the room (through the door, hence the reference to a door in the retelling) and sees that the dog has eaten the cake. Note that in this retelling, not only object pronouns (*le*) are used as prefixes, but also the first person singular subject pronoun *je* seems to be used in this way in third person singular contexts. Potential light verbs, pronouns or prefix forms are printed in bold and left untranslated. Note that they can only be distinguished from the determiners *le* and *la* by the context in which they appear. This learner presents an extreme case of use of these prefixes and is one of the three learners in the entire corpus who also overuses subject pronouns. The data from this learner account for 23 of the 85 excluded utterances, and it should be noted that most learners in the present corpus produced no or a much lower number of clearly unanalyzed prefix-like forms.

le chien **je** mont/e/ la table. chien le chien	The dog $climb_{INF/PP}$ table. dog the dog.
le grosse, **le** mang/e/ le gateau	Fat, $eat_{INF/PP}$ the cake
le gross/e/,	(becoming) $fat_{INF/PP}$
elle la porte regard/e/, est le chien,	She the door $look_{INF/PP}$, is (or: and) the dog
le cherche le gateau,	$Look_{FIN}$ for cake

with *imparfait* forms. The following Table 4 therefore presents the data for verbs *not* ending in *-er* only.

	***fin*, second**	***inf*, second**	***PP*, second**	***fin*, final**	***inf*, final**	***PP*, final**
no-aux	22	5	2	2	0	0
1-aux	22	2	6	1	1	0
aux	42	7	7	0	0	0

Table 4: Frequency of different verb complement sentences in third person singular contexts (finite and non-finite lexical main verbs preceding or following the verb complement) in learners of French for verbs not ending in -er

As far as can be concluded from these overall low numbers, there are again no clear indications that the use of non-finite lexical main verbs would be more wide-spread in learners who do not use auxiliaries than in learners who use auxiliaries. The use of finite forms in comparison to infinitives and (bare) past participles as main verbs is not significantly different in the aux group when compared to the no-aux group ($\chi^2(1) = 0.01$, ns). Table 5 shows that the same holds for the more frequent verb forms ending in *-er*, in which there is again no significant difference ($\chi^2(1) = 0.11$, ns) (note that infinitives and past participles cannot be distinguished from each other for these types of verbs).

	***fin*, second**	***non-fin*, second**	***fin*, final**	***non-fin*, final**
no-aux (n = 10)	25	24	2	3
1 aux (n =10)	36	23	2	4
aux (n = 21)	78	67	0	0

Table 5: Frequency of different verb complement sentences in third person singular contexts (finite and non-finite lexical main verbs preceding or following the verb complement) in learners of French for verbs ending in -er

Examples of verb complement structures with different types of verbs are given in the following:

Structures with verbs ending in -er:

(15) il mange le gateau
he eat_{FIN} the cake

(16) après mang/e/ tout le gateau
afterwards, $eat_{INF/PP}$ all the cake

Structures with other lexical verbs:

(17) après la mademoiselle ouvrir la four
afterwards the Miss open$_{INF}$ the oven

(18) elle ouvre la four
she open$_{FIN}$ the oven

(19) ouvrir la porte dans la chambre
open$_{INF}$ the door in the room

(20) mademoiselle ouvert la porte
Miss open$_{PP}$ the door

(21) elle met sur la table
she put$_{FIN}$ on the table

(22) elle mettre sur la table le gateau
she put$_{INF}$ on the table the cake

(23) il descendu scalier
he go-down$_{PP}$ stairs

These examples show that learners use finite, infinite and past participle forms without obvious functional motivations for the use of a specific form. The numbers in Table 4 are low, but this is due to the fact that they are restricted to verb complement structures to ensure the comparability with the German data and with the stimuli used in the experiment. If other types of utterances are included, especially the intransitive verbs *dormir*, *partir* and *sortir* which occur frequently in the data, it is fair to say that there is a wide-spread use of both infinitival and past participle forms as main verbs, which does not seem to change with the acquisition of auxiliaries. Therefore the first research question given above has to be answered in the negative: In the production of the current learner group, there is no clear indication that the acquisition of the finiteness distinction on lexical main verbs stands in any relation to the acquisition of auxiliaries. Although auxiliaries are used by the learners of French more often than by the learners of German, their use does not seem to have the same consequences on the learner system. While auxiliaries seem to help learners of German to discover the form and function of finiteness, no comparable evidence can be found in the production of the learners of French. This suggests that learners of French analyze auxiliaries differently from learners of German. In particular, it might be that learners of

French do not understand the function of these verbs as carriers of finiteness, and this trigger might be missing for the development of the notion of finiteness also with respect to lexical verbs.

Before concluding that learners of French make no difference between finite and non-finite lexical verb forms, one should remember that the learners of German also use both types of forms interchangeably (albeit with different frequencies in different groups), and that despite this seemingly optional use, the learners of German were found to make a difference in the interpretation of finite and non-finite lexical verb utterances. Moreover, while the production data show that the proportion of finite verbs does not noticeably change with the acquisition of the auxiliary system in French, the proportion is relatively high even in the learners of French who do not produce auxiliaries. All learner groups of French use finite verbs to a similar degree as the German aux group, and no group could be found in the learners of French in which the proportion of finite utterances would be as low as in the German no-aux group. It might be that *all* of the learners of French tested here have discovered the form and function of finiteness marking on lexical verbs. It thus seems to be worthwhile to test the interpretation preferences of the learners of French in the same way as has been done for the learners of German, to find out whether *none* of the learner groups is aware of the relation between finiteness and assertion, *only some* of the groups (in particular, the group using auxiliaries), or whether *all* learners can be shown to be aware of this relation in comprehension.

2.3 Picture selection

The picture selection task used here is exactly identical to the task presented in the previous chapter. The pictures are the same, and the stimuli sentences are direct translations of the German sentences, which were read out and pre-recorded by native speakers of French. In the construction of the materials, it was made sure that all verbs occurring in the task were very frequent lexical verbs not ending in *-er* in French, in order to test verbs that are unambiguously non-finite in this language.

2.3.1 Materials and procedure

As a reminder, the French version of the crucial conditions is given once more in (24), and the pictures are also presented once more in Figure 1. A full list of all conditions and items in this task can be found in appendix C2.

(24) A: Est-ce que tu crois que Pierre construit une table?
'Do you think that Peter constructs a table?'
B1: Pierre construit une table
Peter construct$_{FIN}$ a table
'Peter builds a table'
B2: Pierre construire un table
Peter build$_{INF}$ a table
'Peter build a table'

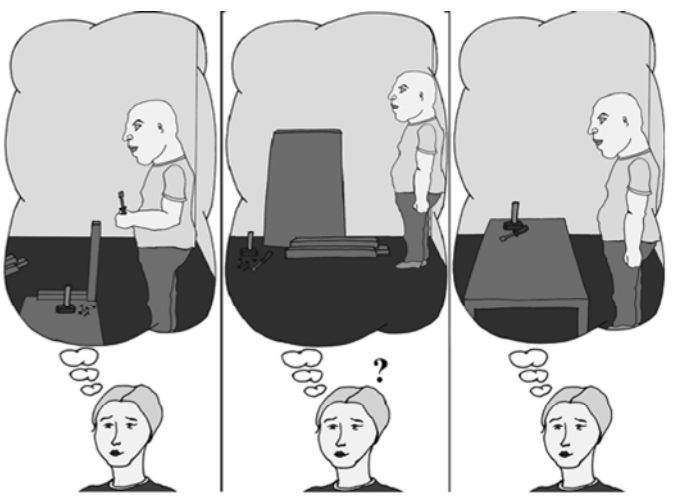

Figure 1: Pictures for item "Peter constructs a table"

Recall that in German, the proportion of choices of the open picture was higher for non-finite than for finite utterances in the aux group and in native speakers, whereas the assertion picture was chosen more often for finite than for non-finite utterances in these groups. The no-aux group chose the assertion picture more often for non-finite than for finite utterances, and did not choose the open picture to a different degree for the two utterances types. If a similar pattern could be found in French, this would constitute evidence that the acquisition of auxiliaries changes the interpretation of finite and non-finite lexical verb utterances.

2.3.2 Results

The full results for the four different groups (no-aux, 1-aux, aux and native speakers) are given in appendix E. The no-aux and 1-aux group behave almost identical in this task (see appendix E.3), so that the results of these two groups will be collapsed in the following. This collapsed group of learners who produced either no or one auxiliary will be referred to as no-aux group in the following (see appendix E.2).

Trigger and control conditions

The results for the trigger and control conditions are very similar to the results for German (see appendix E.2 and E.1, respectively) and in general confirm the expectations for each type of utterance: Concerning the trigger conditions, finite and non-finite utterances occurring with a rising intonation contour led, as had been anticipated, to a relatively high number of choices of the open picture. As for the control conditions, utterances of the type "I don't know whether Peter constructs a table" also led to the anticipated high number of choices of the open picture. Utterances in the *passé composé* (*Pierre a construit une table*, roughly "Peter has built a table") lead to the anticipated high number of choices of the completed picture for the aux group and the native speakers, whereas the no-aux group relatively frequently chose the assertion picture for this utterance type. In that respect, this group behaves like the no-aux group in the learners of German, further justifying the decision to include learners who produced one auxiliary in the no-aux group in French. All in all, these results show that the pictures and conditions in which finiteness was not manipulated led to similar interpretations in the participants of both languages. In the following paragraph, the question of whether finite and non-finite utterances were also interpreted in a similar way in the two target languages is investigated.

The interpretation of finite versus non-finite utterances

The choices of the three pictures in the two critical conditions for the three groups of participants are presented in Figure 2.

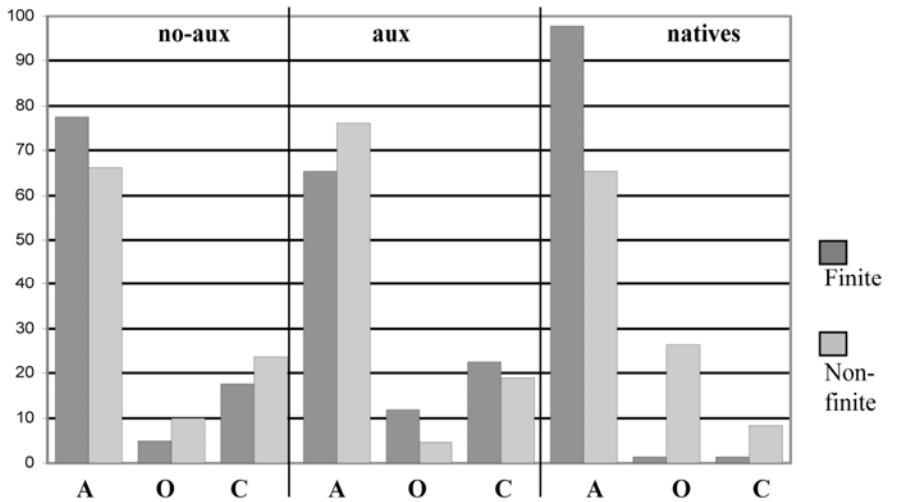

Figure 2: Choices of each of the three pictures in percentage of all trials of each condition. A = assertion picture, O = open picture, C = completed picture.

The native speakers of French chose the assertion picture in almost all cases (70 out of 72) for finite utterances, but less often for non-finite utterances. In the same way as for the speakers of German, a logit mixed effect model with subjects and items as random factors, condition as the predictor of interest, and picture A vs. O (whether the assertion or the open picture was chosen in all cases in which one of these two pictures was chosen) as the dependent variable was used for the statistical analysis. For the native speakers, this analysis showed that utterance type had a significant influence on picture choice (wald $z = 2.6$, $p < 0.01$).

In contrast to the native speakers, the learners of French did not show differences between the interpretation of finite and non-finite utterances. For both types of utterances, the assertion picture was chosen in most cases. In around twenty percent of the cases, the completed picture was chosen, whereas the open picture was very rarely chosen for the two critical utterance types. Statistical analyses confirmed that whether the presented utterances were finite or non-finite did not have a significant influence on the choices of the assertion versus the open picture in neither the no-aux group (wald $z = 1.43$, ns) nor the aux group (wald $z = 1.62$, ns). To sum up, learners of French do not interpret finite and non-finite utterances as differing in assertion. This holds for learners who do not use auxiliaries as well as for learners who use auxiliaries.[5]

[5] Based on this results, one might wonder whether there are *any* sub-groups in the French learners that make a difference between the two utterance types, even if these subgroups are not based on auxiliary use. To answer this question, an additional analysis was performed in which the learners were regrouped according to the percentage

2.3.3 Discussion

The results for the native speakers are compatible with the assumption that finiteness expresses assertion for these speakers. Like native speakers of German, native speakers of French were unsure about how to interpret non-finite utterances, and in particular, non-finite utterances do not seem to fit well with an assertion interpretation. As a consequence, they chose the open picture for this condition relatively often. Note that this tendency is even clearer for the native speakers of French than it had been for the native speakers of German. This is important because it shows that for native speakers, the finite - non-finite distinction is at least as clear in French as in German. Even though finiteness is only marked morphologically in the French stimulus sentences, native participants clearly reacted to this formal difference in their interpretation of the utterances.

A different picture emerges for the learners. If learners are grouped according to their use of auxiliaries, the difference between the two groups is the opposite of the difference observed in German: The aux group chose the assertion picture more often for the non-finite utterances than did the no-aux group. It might be that for some learners of the no-aux group, the infinitival forms of verbs are unfamiliar and this is what prevented them from finding a clear interpretation. Since the difference between the choices for finite and non-finite utterances is not significant in either of the groups, these numerical differences should, however, not be further interpreted. What can be concluded is that there is no indication that learners who differ in their use of auxiliaries make a difference in interpretation between finite and non-finite utterances.

All in all, it seems that learners of German associate the finiteness distinction on lexical verbs with a meaning difference, whereas learners of French, at the stage of acquisition investigated here, do not associate any meaning difference with this distinction. Both utterance types are compatible with an assertion for them. This suggests that at this stage, assertion is presumably achieved by lexical and word order means, but not associated with finite morphology yet. Before further discussing this finding, let us briefly consider whether there are alternative explanations for the results.

First, the lack of an effect might be due to the fact that learners were unfamiliar with the verb forms that were tested, given that they were not part of the most frequent verb

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of finite verb complement utterances out of all verb complement utterances (this measure is similar to the one used in the aux group for the German learners in the preceding chapter). There were 21 learners who produced less than 54% of finite utterances out of all verb complement utterances, and 20 learners who produced 60% finite utterances or more (see appendix B2.7 for an overview of the production of these two groups). The results in the picture selection task for these two groups can be found in appendix E.4. The results for the two critical conditions (finite vs. non-finite utterances) show that both groups rarely chose the open picture for any of these two utterance types. Indeed, there were no significant differences in the interpretations made for the finite and the non-finite utterance in either of the two groups ('low fin' group: wald z = 0.75, ns, 'high fin' group: wald z = 0.65, ns). Thus, even when learners of French are grouped according to how often they use finite vs. non-finite utterances in their production, no differences are observed in the interpretation of these utterances in the two groups.

group of verbs ending in *-er*. It is not possible to construct an experiment so that this possible difference in familiarity between German and French could be completely ruled out, as verbs ending in *-er* cannot be tested in any sensible way in the learners of French, given that this form is homophonous to the past participle. It seems unlikely, however, that this causes the observed cross-linguistic difference. First, while the lexical items used did not belong to the most frequent verb group, the items in themselves were frequent items, and direct translation equivalents in German and French. Second, as shown in the production part of the present study, the learners tested here use verbs belonging to the groups not ending in *-er* quite regularly, and also use different existing suffixes, not only the bare stems. Moreover, it is in particular in the presumably more proficient aux group that the absence of an effect is surprising and different from German, and it seems unlikely for this subgroup in particular that learners would not be familiar with verb forms other than those of the *-er* paradigm.

As a second possibly problematic aspect of the results, one might wonder whether the difference between the German and French experiment was caused by the fact that in German, morphology and syntax varied between the 'finite' and the 'non-finite' condition, whereas in French, only morphology changed. Whereas this had no effect for the natives, it might be that the difference in the position of the verb helped the learners of German to make a meaning difference between the two forms. The study presented in chapter 4 does not allow us to decide whether the aux group in the learners of German was influenced by the syntactic or the morphological properties of the non-finite stimuli. However, while it would be interesting in subsequent studies to disentangle the influence of these two factors, the fact that this was not done in the present study does not harm its overall research goal. The aim was to find out whether learners are sensitive to the difference between finite and non-finite forms, as realized in their target languages. The fact that the VP is head-initial in French, so that non-finite verb appear closer to the position of the finite verb, might be part of what makes it harder for learners of French than for learners of German to become aware of the finiteness distinction. In that sense, the fact that this difference might have contributed to the results does not harm the conclusions of the present study: Turkish learners of French are less sensitive to the finiteness distinction in French than Turkish learners of German are to the finiteness distinction in German.

3. General discussion

The results from production and comprehension revealed a clear difference between learners of German and learners of French. In German, learners showed sensitivity to the distinction between finite and non-finite forms and had preferences for both the use of one of these forms and its interpretation as assertion. These preferences were different depending on whether or not the learners used auxiliaries: Learners who did not yet use

auxiliaries followed a system in which non-finite forms represented the default utterance form and function as assertions, whereas learners who used auxiliaries were aware of the fact that assertion is marked by morpho-syntactic finiteness in German, even if they might have, in their production, still shifted between the two systems. No such sensitivity to the finiteness distinction on lexical main verbs was found in the learners of French. This raises the question of what it is about French that causes learners not to incorporate a distinction in their grammar that learners of German do incorporate.

To understand the causes of this difference, it is useful to first consider the behavior of the least advanced learners, the no-aux groups, in both languages. As has been shown in detail in the preceding chapter, for the German no-aux group, a non-finite utterance form represents the default form of an assertion. Learners in this group predominantly use these forms in their production, and they map them straightforwardly on the assertion picture. This is not the case to the same degree in the no-aux group in French. The learners in this group already use finite verb forms and positions to a similar degree as the more advanced group. Similarly to the German no-aux group, they choose the assertion picture for the non-finite utterance, but they do so to the same degree for the finite utterance.

It seems that something in the German input pushes learners to choose a non-finite instead of a finite default utterance form, and that this influence is not present in French. As already discussed in chapter 3, it seems very likely that the difference might lie in the fact that learners of German can find verbs in clause-final position in the input more often than learners of French. This is due to the different word order in subordinate clauses and the different headedness of the VP, which often leads to the (non-finite) verb appearing sentence-finally in German, but close to the second position in French. The final position goes particularly well together with the developing grammar of Turkish learners of German. In particular, a clause-final position of the verb resembles the surface position of the verb in the native language, Turkish, and it can well be reconciled with an initially VP-based grammar of the target language. The verb that learners of German find in this final position is not always a non-finite form (not necessarily in subordinate clauses), but this is often the case, for instance, where a non-finite verb appears clause-finally in modal verb constructions.

Learners of German thus receive evidence in the input that confirms the non-finite system with which they start out. As shown in the preceding chapter, a change towards a finite system is then triggered by the acquisition of auxiliaries. These make the function of finiteness transparent to the learner, because they are relatively 'pure' carriers of these functions due to their lack of lexical content (Dimroth et al., 2003). Learners then have to learn that lexical verbs can also take a finite form, they can appear in the same position as auxiliary verbs, and they can fulfill the same functions in addition to carrying descriptive

content. The fact that learners have to change their originally non-finite grammar to incorporate all this new knowledge might lead to the newly acquired form-function relations becoming particularly transparent to them. For learners of German, the formal properties of finiteness consist precisely of what they have to change in the originally non-finite system: Verbs have to be inflected, and they have to appear in second position. The fact that this change is highly salient might make it obvious to learners that a particular meaning is attached to these newly discovered forms. This might make them become aware of the fact that purely non-finite utterances do not formally express assertion, and lead them to restrict this meaning to finite utterances.

In contrast, in French, there is little evidence in the input for a non-finite system, in particular, because verbs rarely appear clause-finally. As a consequence, learners adopt the raised position of the verb relatively early in the acquisition process. As for the role of auxiliaries, it has been shown earlier in this chapter that auxiliaries and light verbs in general are acquired earlier and used more by learners of French than by learners of German. The use of auxiliaries and light verbs in general might be enhanced by the frequent use of syntactic constructions that involve light verbs in the target language, in particular, cleft-constructions. However, it seems that the analysis of light verbs as carriers of finiteness is rather hindered than facilitated by their frequent use in different contexts. Learners seem to take light verbs over as parts of unanalyzed chunks, such as the chunk *c'est* which seems to be used in a general utterance-opening function. Therefore learners might not be aware of the fact that this chunk contains a subject pronoun and a verb which is marked for agreement. As for auxiliaries, learners might analyze them as prefix to the main verb, the function of which seems to remain unclear to learners for a long time in development (Perdue et al., 1992). In sum, auxiliaries and light verbs in general might thus be less transparent signals of the functions of finiteness in French than they are in German, and this might hinder learners in becoming aware that these functions can be expressed by verbal morphology, both on light verbs and on lexical verbs.

The problem for the learners of French to understand the difference between finite and non-finite forms might be further augmented by the properties of verbal morphology in French. The (spoken) agreement paradigm is very reduced, so that there is no salient difference between finite forms, which change their form according to the context, and non-finite forms, which do not change their form. In French, non-finite forms are invariable, but finite forms also rarely change their form. In addition, it might be confusing that the most frequent infinitival forms, those ending in *-er*, are homophonous to the past participle. This might make learners perceive the contrast between finite and non-finite forms as a contrast in tense or aspect, and further blur the finiteness distinction.

To sum up, learners of French start out with a 'relatively finite' system in the sense that they use a raised position for verbs, they mimic the use of light verbs, and they use

finite lexical verb forms as default forms from relatively early stages of acquisition on. But they do not receive transparent cues from the input that would make the division of labor between finite and non-finite verb forms clear to them. It seems, therefore, that it is precisely the absence of a contrast between an initial non-finite and a later finite system that might make it hard for learners to discover the function of finiteness.

Starting with a clearly non-finite system, as do the learners of German, seems to be more helpful for ultimately acquiring a native-like understanding of finiteness than being able to successfully 'mimic' the finite target system early in the acquisition process, as do the learners of French. This conclusion is supported by previous findings on the acquisition of German by learners of different first languages who were studied by Haberzettl (2005). Haberzettl shows that Turkish learners have more problems than Russian learners in the initial stages of the acquisition of verb raising. Presumably, the Russian learners acquire verb raising more easily because the second position in the sentence resembles the position of the verb in Russian declarative main clauses. Once the Turkish learners of German investigated by Haberzettl (2005) had acquired the correct word order in main clauses, however, they were then more successful than the Russian learners in further grammatical developments, in particular, in the word order in subordinate clauses. Similarly, as soon as they have reached a certain stage of proficiency the learners of German investigated here seem to be more aware of the assertion marking function of finiteness than the learners of French.

The failure to associate finiteness with assertion need not necessarily hinder learners of French in their production and comprehension of utterances. These learners can keep relying on a default system of assertion marking in which every combination of topical and predicative elements form together an assertion, and the results of the picture selection task suggest that this is indeed the case. However, there are many phenomena in language that are connected to finiteness, and the development of these phenomena might be blocked in learners who are not aware of the finiteness distinction. The most obvious ones are the expression of tense and aspect, which are linked to the finite verb in both German and French. The investigation of further developments in the domain of finiteness are beyond the scope of this chapter. It could be interesting in further research to test the hypothesis that learners of French are more prone to fossilize on non-verbal means to express temporal and aspectual distinctions than learners of German.

Summary and conclusions

Chapter 6

In this dissertation, the acquisition of finiteness in German and French was investigated from different angles and using different methods in order to find evidence for the knowledge beginning learners have about forms and functions of finiteness.

The first two chapters dealt with learners' *formal* knowledge of finiteness, by studying the production, imitation and processing of negated sentences. Negated sentences provide an interesting test case for teasing apart different approaches to formal knowledge about finiteness. In particular, negation allows us to determine the position of the verb in the underlying phrase structure: If learners place finite verbs to the left of the negator, this is generally taken as evidence that they have knowledge about verb raising to a functional category, as claimed by, among others Prévost and White (2000). If learners place verbs to the right of the negator, this can be taken as evidence that they do not (or not yet) have access to such categories. Researchers who argue for the absence of native-like functional categories in early learner language have made different proposals as to what factors might alternatively influence the structure of utterances at this stage of acquisition. Syntactic approaches have suggested that functional categories are projected by these learners, but that they do not have native-like properties (Beck, 1998; Eubank, 1993), that the structure of (early) learner utterances is determined by a VP-based grammar (Vainikka and Young-Scholten, 1996a, 1996b) or that learner language reflects the acquisition of (frequent) surface patterns as opposed to underlying phrase structure (Meisel, 1997). In contrast, functional approaches to early learner language have argued that the utterance structure at this stage of development can best be described as following semantic principles (Dimroth et al., 2003; Klein and Perdue, 1997; Perdue, 1993). By testing the same negated stimuli sentences in two different tasks, the studies reported in chapters 2 and 3 help arbitrate between these different proposals.

In the study reported in chapter 2, a self-paced listening task was used in which participants processed negated sentences for comprehension, and the processing difficulty was determined at each point in the sentence. It was found that learners of German as well as learners of French were faster in their processing of sentence segments following the verb and the negator when the (lexical) verb occurred to the right than when it occurred to the left of the negator, whereas they showed no clear preferences between pre- or post-auxiliary negation. It is argued that this pattern of results can be explained by semantic approaches to early learner language, but it is hard to reconcile with the different syntactic

approaches. Semantic approaches can explain the obtained pattern by assuming that negated sentences are easier to process when the negator precedes its domain of application. As lexical verbs, but not auxiliaries, typically form part of the domain of application of negation, this approach can explain the preference for pre-verbal negation with lexical verbs and the absence of preferences for auxiliary sentences. It is concluded that semantic principles play a strong role in learners' processing of negated sentences, and presumably form an important part of their knowledge about the target language in general.

In the study presented in chapter 3, an elicited imitation task was used in order to test whether evidence about native-like syntactic principles can be found in addition to the semantic knowledge discussed in chapter 2. In elicited imitation, participants have to repeat sentences, which presumably demands fewer processing resources than spontaneous production and might thereby reveal form-related knowledge that learners do not yet use in production (Naiman, 1974; Verhagen, 2005, 2009). Indeed, a subgroup of the learners of German and all learners of French showed preferences in this task that are in accordance with the grammar of the target language, but that could not be detected in the self-paced listening task and were not always detectable in learners' production either. In particular, learners of both target languages often changed non-finite verbs occurring in a raised position into a finite form while repeating the sentence, whereas they made no changes to the same verb forms when they occurred in an unraised position. It is concluded that these learners have knowledge about the relation between finiteness and verb placement in the target language, speaking for the presence of functional categories in their grammar, even though these might not be projected for every utterance.

However, the results for a less advanced subgroup in the learners of German speak against the assumption that this knowledge is already present at very early stages of development. Rather, the least proficient learners of German tested here did not make any systematic changes to lexical verb sentences in the elicited imitation task, contrary to what was observed for learners of French and the more advanced learners of German. They did, however, sometimes change the placement of auxiliaries from an unraised to a raised position while repeating the sentences. This suggests that this learner group is at a stage of development in which native-like syntactic constraints are not yet in place and the utterance structure is dominantly determined by semantic constraints, according to which auxiliaries, but not lexical verbs, can precede the negator. Taken together, the results presented in chapter 3 support a structure-building approach to syntactic knowledge, according to which syntactic knowledge is built up in a step-wise manner and learners can fall back to previous stages of development (Dimroth et al., 2003; Vainikka and Young-Scholten, 1996a, 1996b).

Taken together, the results of chapters 2 and 3 suggest that the learner grammar is characterized by an interplay of cross-linguistically valid semantic and language-specific syntactic principles, and that their relative weight might change during the acquisition

process. Whereas semantic constraints are clearly predominant in the beginning learners of German, the more advanced learners seem to be at a stage in which both semantic and syntactic principles have an influence on their utterance structure. If these principles pull in opposing directions, as is the case for negated sentences containing lexical verbs, which constraint 'wins' may depend on the requirements of the situation: When processing sentences for comprehension, as in the self-paced listening task, learners show a preference for the semantically more transparent pre-verbal negation pattern. In elicited imitation, which asks for the production of utterances, form-based knowledge seems to play a stronger role. This finding shows that it is important to combine different methods to gain an in-depth picture of learners' knowledge. On the one hand, using a more form-oriented task such as imitation is useful for testing linguistic theories that usually make claims about linguistic competence rather than performance. On the other hand, using self-paced listening which presumably taps knowledge as learners use it in natural situations to process the target language can give a more accurate picture of the relative weight of different aspects of learners' knowledge in actual use.

Finally, the results in chapters 2 and 3 reveal differences in learners' formal knowledge in German and French. While both groups of learners showed a preference for preverbal negation in processing, only the learners of German also preferred this position in their production. Instances of preverbal negation were found in the learners of French, but the majority of negated utterances in this learner group were utterances in which the verb was placed to the left of the negator. Moreover, learners of French also showed a preference for finite over non-finite morphology both in production and imitation, whereas only a more advanced subgroup of the learners of German preferred finite over non-finite verbs. These observations suggest that the acquisition of verb raising and finite verb forms is more strongly triggered by the exposure to French than by the exposure to German. In German, learners go through a phase in which they prefer unraised and non-finite verb forms, and they only acquire native-like structures in a second step. As discussed in chapter 5, important factors causing this difference might be the more consistent word order in French which, is the same in main and subordinate clauses, in contrast to German, and the headedness of the VP which leads to a clearer difference between the positions of finite and non-finite verbs in German than in French. However, the rapid acquisition of a certain pattern does not necessarily mean that the knowledge about this pattern is well established and similar to native knowledge. The studies presented in chapters 4 and 5, which investigated the knowledge learners have about the *meaning* of finiteness, provide evidence that the knowledge learners of French have acquired about the target language might in some respects be more superficial than the knowledge in the (more advanced) group of learners of German.

The studies presented in chapters 4 and 5 rely on the semantic analysis of finiteness proposed by Klein (1998, 2006). According to this analysis, finiteness expresses that the descriptive content of an utterance holds at the time and place to which the utterance refers, and thereby marks the utterance as making an assertion. An utterance lacking finiteness thus lacks any formal marking of the claim that the descriptive content of this utterance is true. According to a stage-model proposed by Dimroth et al. (2003), learners of Germanic languages are not aware of this assertion-marking function of finiteness in early phases of development. At these early stages, learners mark assertion by juxtaposing a topic and a (verbal) predicate, without making use of finite morpho-syntax for expressing assertion. According to Dimroth et al. (2003), the acquisition of the target-like function of finiteness is then triggered by the acquisition of auxiliaries. In the study presented in chapter 4, this model was tested in a picture selection task. In this task, learners and native speakers listened to finite and non-finite utterances and had to choose a picture that matched the meaning of the utterance. On one of the presented pictures, the 'assertion picture', the speaker of the utterance was depicted as being convinced of the truth of the content of the utterance. On an alternative picture, the 'open picture', the speaker was depicted as doubting whether the content of the utterance was true. It was found that native speakers and learners who had acquired auxiliaries chose the open picture more often for non-finite than for finite utterances, and preferred the assertion picture for finite as compared to non-finite utterances. In contrast, learners of German who did not use auxiliaries did not make this difference in assertion between finite and non-finite utterances: They chose the assertion picture even more often for non-finite than for finite utterances. This finding suggests that similarly to what has been shown in chapter 3 with respect to formal knowledge, functional knowledge about finiteness is built up in a step-wise process, in which the acquisition of auxiliaries presents a crucial turning point.

Chapter 5 presents a study that investigates whether a similar development can be observed in the learners of French. More precisely, it was tested whether learners of French can be shown to shift from using and interpreting non-finite utterances as assertions to mainly using and interpreting finite utterances this way, and whether this presumed shift coincides with the acquisition of auxiliaries, as in German. Using the same production and picture selection tasks that had been used for the learners of German, it was found that no such change can be observed in French. Learners of French were shown to use a relatively high percentage of finite utterances independently of whether they had acquired auxiliaries or not. But they interpreted both finite and non-finite utterances as assertions, suggesting that they are not aware of the assertion-marking function of finiteness. A number of differences between French and German are discussed in chapter 5 that might cause this different acquisition path. In particular, the more opaque agreement paradigm in spoken

French when compared to German might contribute to this difference, in addition to the syntactic differences mentioned above.

The difference in understanding of the function of finiteness between learners of German and French sheds new light on the findings in chapters 2 and 3: While these purely formally oriented investigations of the learner system in many respects give the impression that the learners of French are 'more successful' than the learners of German, the functional perspective taken in chapters 4 and 5 shows that the acquisition of knowledge about forms does not necessarily go together with the acquisition of target-like functions of these forms, and that in some cases, slower acquisition paths might even be more successful in the end. On a more general level, this shows that by investigating both formal and functional knowledge, by using different methods and comparing the acquisition of one phenomenon in different languages, a deeper understanding of what it means to have acquired knowledge about a certain linguistic phenomenon than is possible when concentrating on one type of evidence only can be obtained. Comparing results from different tasks and in different languages makes clear how many aspects knowledge about one phenomenon can have, and that these aspects might be of different importance in different situations. Future studies could use some of the methods used in this dissertation to further investigate the many aspects of the acquisition of finiteness that have not been treated here. In particular, it would be interesting to study how the acquisition of finiteness continues in more advanced learners, and how learners acquire and use knowledge about aspects of finiteness that have not been treated here, such as the expression of temporal and aspectual distinctions.

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Appendix

Appendix A: Participants and participation in experiments

The following tables display for each participant the sex, age, length of residence and time spent in a language course of German or French respectively.[1] Note that this time is given in months, the numbers of hours per participant varied and were typically around 15 hours a week. 'ppt. nr.' (participant number) refers to the number given to participants in order to be able to refer to them in an anonymous way. In the remaining columns, it is indicated in which tasks the participants participated. There were two production tasks (retelling of the auxiliary stories, Verhagen, 2005, and retelling of the finite story, Dimroth, 2005), and the self-paced listening, imitation and picture selection experiments described in more detail in the text. A cross ('x') means that participants participated in the experiment in question, 'pilot' means that participants did not participate in the final version, but in a pilot version of the experiment that is not reported in the text, 'no' means that the participants did not participate, 'n.u.' (not used) means that the participant performed the task, but the obtained data were not included in the analysis[2], and 'inc.' (incomplete) means that a recording of a story was incomplete.

[1] All of the tested learners spoke Turkish as their mother tongue. Eight learners of German and thirteen learners of French were bilingual speakers of Kurdish and Turkish, one learner of German and one learner of French were bilingual speakers of Arabic and Turkish, and two learners of French were bilingual speakers of Turkish and Armenian. All of these bilingual speakers reported Turkish to be their dominant language, and in many cases the only language they were still actively using. There was also one learner of German who reported having acquired high proficiency in Azerbaijani and Russian as L2s. All of the remaining learners had no or very limited knowledge of another second language.

[2] For the learners of German, participant 21 did not participate in the imitation and picture selection task because the second session with this participant was cancelled. Participant 50 did not want to complete the imitation task. For the participants 60 and 65, there was too little time available to complete all the tasks, so it was decided to leave out the imitation task for both participants and the finite story for participant 60. For participants 44 and 57, only parts of the finite story were recorded because the recording device was accidentally switched off at the beginning of the recording. For participant 69, the recording of the auxiliary stories was corrupted and could therefore not be used. For the learners of French, the self-paced listening data of participant 102 could not be used because there were errors in the experimental list. The self-paced listening data from participants 106, 112, 136, 143 were excluded from the final analyses because in at least one segment, all data points of these participants were more than 2 standard deviations away from the group mean for that segment (see chapter 2). For participants 114 and 143, there was not enough time available, so the auxiliary stories and the imitation task were not completed for participant 114 and the imitation and picture selection task were left out for participant 143. Participant 127 retold the auxiliary stories, but the recording quality was so bad that the data could not be used. The same holds for the finite story recorded with participant 119. The data for the picture selection task of those participants for whom no data from the 'auxiliary stories' were available were excluded, because these stories were designed to elicit the use of auxiliaries and the number of auxiliaries was the criterion for the group-division in the picture selection experiment (participants 114 and 127 were excluded for this reason). Note that this was not done for the one learner of German for whom the recording of the auxiliary stories was lost (69), as, in contrast to the relevant learners of French, this learner produced a high number of auxiliaries in the other production task, so that

A.1: Information about the Turkish learners of German

ppt nr.	sex	age	Residence (years;months)	Instruction (months)	Aux. stories	Finite story	self-paced listening	imitation	picture selection
11	f	48	25	12	x	x	pilot	x	pilot
12	f	32	13	6	x	x	pilot	x	pilot
14	f	31	4	24	x	x	pilot	x	pilot
17	f	27	6.08	0	x	x	pilot	x	pilot
18	f	28	8.08	6	x	x	pilot	x	pilot
20	m	27	2.03	0	x	x	x	x	x
21	m	23	0.1	3	x	x	x	no	no
22	f	24	4	6	x	x	x	x	x
23	m	48	14	7	x	x	x	x	x
24	f	37	18	3	x	x	x	x	x
25	m	32	1.11	7	x	x	x	x	x
26	m	23	2	4	x	x	x	x	x
27	f	29	6	2	x	x	x	x	x
29	f	29	10.07	4	x	x	x	x	x
30	f	34	14.1	9	x	x	x	x	x
31	m	29	1	7	x	x	x	x	x
32	m	29	6	5	x	x	x	x	x
33	m	51	18	3	x	x	x	x	x
34	f	27	19	1	x	x	x	x	x
36	f	29	11	16	x	x	x	x	x
37	f	36	15.09	6	x	x	x	x	x
39	m	31	4	1	x	x	x	x	x
40	f	29	4	12	x	x	x	x	x
41	f	27	10	7	x	x	x	x	x
42	m	34	9	2	x	x	x	x	x
43	f	35	21	0	x	x	x	x	x
44	f	38	6	3	x	inc.	x	x	x
45	f	35	17	13	x	x	x	x	x
47	f	28	10	2	x	x	x	x	x
48	m	45	2.06	3	x	x	x	x	x
49	m	25	5	4	x	x	x	x	x
50	f	24	16	6	x	x	x	n.u.	x
51	f	26	8	6	x	x	x	x	x
52	m	43	12	5	x	x	x	x	x
53	f	40	4	1	x	x	x	x	x
55	m	23	2	4	x	x	x	x	x
57	f	27	11	3	x	inc.	x	x	x
58	m	41	4.08	15	x	x	x	x	x
59	f	45	25	7	x	x	x	x	x
60	f	42	11	2	x	no	x	no	x
61	f	29	8	2	x	x	x	x	x
62	m	40	17	9	x	x	x	x	x
63	f	31	10	2	x	x	x	x	x
64	m	44	15	7	x	x	x	x	x
65	f	47	14	0	x	x	x	no	x
66	m	28	6	3	x	x	x	x	x
67	f	32	12	12	x	x	x	x	x
69	f	36	2.03	6	n.u.	x	x	x	x
70	f	43	2	17	x	x	x	x	x
71	m	38	2.03	7	x	x	x	x	x
72	f	23	2.03	5	x	x	x	x	x
73	f	17	0.06	2	x	x	x	x	x

she could safely be attributed to the 'aux group'. Finally, the results for the picture selection experiment performed by participant 136 were lost and could not be included for that reason.

A.2: Information about the Turkish learners of French

ppt nr.	sex	age	Residence (years;months)	Instruction (months)	Aux. stories	Finite story	self-paced listening	imitation	picture selection
101	f	38	13;4	7	x	x	x	x	x
102	m	45	12;10	0	x	x	n.u.	x	x
103	f	30	5;3	3	x	x	x	x	x
104	m	47	24;0	3	x	x	x	x	x
105	f	41	0;9	4	x	x	x	x	x
106	f	26	0;10	5	x	x	(x)	x	x
107	f	44	26;0	4	x	x	x	x	x
108	f	38	15;3	15	x	x	x	x	x
109	f	39	17;10	8	x	x	x	x	x
110	f	31	5;7	48	x	x	x	x	x
111	f	49	23;4	20	x	x	x	x	x
112	m	30	0;6	1	x	x	(x)	x	x
113	m	49	23;0	3	x	x	x	x	x
114	f	21	7;6	24	no	x	x	no	n.u.
116	f	32	0;8	7	x	x	x	x	x
117	f	28	5;5	6	x	x	x	x	x
118	f	36	5;2	20	x	x	x	x	x
119	f	35	17;0	7	x	n.u.	x	x	x
120	f	30	8;0	9	x	x	x	x	x
121	f	48	23;0	6	x	x	x	x	x
123	m	24	1;1	1	x	x	x	x	x
124	f	37	4;5	48	x	x	x	x	x
125	m	24	2;2	0	x	x	x	x	x
126	f	37	10;0	3	x	x	x	x	x
127	f	34	8;9	17	n.u.	x	x	x	n.u.
128	f	49	20;5	6	x	x	x	x	x
129	f	43	5;7	24	x	x	x	x	x
130	m	31	6;8	7	x	x	x	x	x
131	m	37	7;7	3	x	x	x	x	x
132	m	27	0;7	3	x	x	x	x	x
133	m	18	1;6	1	x	x	x	x	x
134	m	22	1;0	2	x	x	x	x	x
136	m	27	0;2	2	x	x	(x)	x	n.u.
137	m	22	1;8	3	x	x	x	x	x
138	m	25	2;2	1	x	x	x	x	x
139	f	42	1;6	6	x	x	x	x	x
140	f	38	8;6	36	x	x	x	x	x
141	f	27	5;9	3	x	x	x	x	x
142	f	35	0;9	5	x	x	x	x	x
143	f	23	5;2	9	x	x	(x)	no	no
144	f	28	10;0	4	x	x	x	x	x
145	f	22	1;8	4	x	x	x	x	x
146	f	36	1;5	16	x	x	x	x	x
147	f	21	1;11	18	x	x	x	x	x
148	m	46	19;10	4	x	x	x	x	x

Appendix B: Production measures

B1 Finiteness and negation

Tables B1.1 and B1.2 summarize data relevant for chapter 3 and appendix D3. For each learner, how many finite and non-finite lexical verbs and light verbs were produced in negated contexts and where they were placed with respect to the negator is indicated. Also indicated is how many lexical main verbs were used overall in both production tasks ('all lex V'), and how many of them were finite ('lex V_{FIN}'). From these two columns, the percentage of correct agreement was computed that was the basis for classifying learners as 'low-agreement' or 'high-agreement' via a median split based on the learners participating in the imitation task. The last two columns show for each learner whether this learner was part of the 'low agreement' group (indicated by a 0), the 'high agreement group' (indicated by a 1) or was not included in the analysis for a given task (indicated by '-'). There is one column for the proficiency split made for the self-paced listening task ('spl', reported in appendix D3) and one for the imitation task ('imit', reported in chapter 3).

B1.1 Finiteness and negation in the learners of German

Part. nr.	neg + INF	neg + FIN	INF + neg	FIN + neg	neg + lv	lv + neg	lex V_{FIN}	all lex V	% corr.	spl	imit
48	0	0	0	0	0	0	0	24	0.00	0	0
72	4	0	0	0	0	0	0	26	0.00	0	0
73	0	0	0	0	0	0	0	24	0.00	0	0
60	0	0	0	0	0	0	0	12	0.00	0	-
17	0	0	0	0	0	0	1	38	2.63	-	0
21	0	0	0	0	0	0	1	30	3.33	0	-
45	5	0	0	0	0	0	2	43	4.65	0	0
42	1	0	0	1	0	0	2	42	4.76	0	0
57	0	0	0	1	0	0	1	15	6.67	0	0
39	1	0	0	0	0	0	2	27	7.41	0	0
71	1	0	0	0	0	0	2	22	9.09	0	0
62	1	0	1	0	0	0	4	41	9.76	0	0
12	2	0	0	0	0	0	6	53	11.32	-	0
53	0	0	0	0	0	0	5	37	13.51	0	0
44	2	0	0	0	0	0	3	19	15.79	0	0
20	2	0	0	0	0	0	5	31	16.13	0	0
40	0	0	0	0	0	0	6	37	16.22	0	0
51	4	0	0	0	0	1	7	40	17.50	0	0
11	1	0	0	1	0	2	10	53	18.87	-	0
43	3	0	0	0	0	0	7	37	18.92	0	0
33	3	0	0	1	0	0	13	65	20.00	0	0
55	1	0	0	1	0	0	6	28	21.43	0	0
31	0	0	0	0	0	1	5	19	26.32	0	0
50	3	0	0	2	0	0	13	46	28.26	0	-
26	2	1	1	0	0	0	14	49	28.57	0	0
61	1	1	0	0	0	0	12	38	31.58	0	0
52	2	0	0	0	0	0	16	50	32.00	0	0
47	1	0	0	0	0	3	11	34	32.35	1	1
49	0	0	0	0	0	0	9	27	33.33	1	1
69	2	0	0	0	0	3	4	11	36.36	1	1
32	0	0	0	1	0	0	11	30	36.67	1	1
34	1	0	0	0	0	1	16	43	37.21	1	1
37	2	0	0	0	0	0	22	56	39.29	1	1
67	2	2	1	0	0	1	25	63	39.68	1	1
58	2	0	0	0	0	0	18	41	43.90	1	1
22	2	0	0	0	0	4	21	46	45.65	1	1
66	0	0	0	1	0	1	17	36	47.22	1	1
24	1	0	0	0	0	0	22	43	51.16	1	1
70	1	1	0	0	0	1	18	35	51.43	1	1
63	2	0	0	0	0	2	17	32	53.13	1	1
65	0	0	0	0	0	0	20	37	54.05	1	-
64	1	1	0	0	0	3	29	53	54.72	1	1
27	1	0	0	0	0	0	29	52	55.77	1	1
41	0	0	0	0	0	3	24	43	55.81	1	1
30	0	0	0	1	0	3	27	45	60.00	1	1
14	1	0	0	1	0	5	19	27	70.37	-	1
25	2	1	0	0	0	6	47	65	72.31	1	1
29	0	0	0	0	0	1	18	23	78.26	1	1
18	0	0	0	0	0	0	22	28	78.57	-	1
23	1	0	0	4	0	2	42	52	80.77	1	1
36	0	0	0	1	0	3	42	49	85.71	1	1
59	0	0	0	1	0	3	33	35	94.29	1	1

B1.2 Finiteness and negation in the learners of French

Part. nr.	neg + INF	neg + FIN	INF + neg	FIN + neg	neg + lv	lv + neg	lex V_{FIN}	all lex V	% corr.	spl	imit
128	1	0	0	1	0	0	1	42	2.38	0	0
142	0	0	0	0	0	0	1	8	12.50	0	0
123	1	0	0	1	0	3	2	10	20.00	0	0
107	0	0	0	0	0	1	7	31	22.58	0	0
146	0	0	4	0	0	0	6	25	24.00	0	0
118	0	0	1	0	0	0	9	33	27.27	0	0
132	0	0	0	0	0	0	6	19	31.58	0	0
144	0	0	0	0	0	0	6	18	33.33	0	0
109	1	0	0	2	0	1	18	53	33.96	0	0
117	0	0	0	1	0	1	14	40	35.00	0	0
103	0	2	0	0	0	1	9	24	37.50	0	0
124	0	0	0	0	0	0	9	23	39.13	0	0
104	0	0	0	1	0	7	12	29	41.38	0	0
127	1	0	0	0	0	4	11	26	42.31	0	0
108	0	0	0	4	0	0	14	33	42.42	0	0
101	1	0	1	5	0	3	17	39	43.59	0	0
106	0	0	0	1	0	0	11	23	47.83	-	0
129	0	0	0	1	0	3	12	24	50.00	0	0
141	0	0	0	0	0	4	11	22	50.00	0	0
134	0	0	0	3	0	0	13	22	59.09	0	0
139	0	2	0	0	0	1	25	42	59.52	0	0
105	0	0	0	0	0	2	12	20	60.00	0	0
143	0	0	0	0	0	2	9	15	60.00	-	-
116	0	0	0	0	0	4	13	21	61.90	1	1
121	1	0	0	2	0	3	28	44	63.64	1	1
136	2	3	0	0	0	1	13	20	65.00	-	-
112	0	0	0	0	0	0	19	29	65.52	-	-
131	0	0	0	1	0	0	19	29	65.52	1	1
113	0	0	0	1	0	6	8	12	66.67	1	1
120	0	0	0	0	0	2	16	24	66.67	1	1
102	0	0	0	0	0	7	23	33	69.70	-	1
119	0	0	0	0	0	0	21	29	72.41	1	1
125	0	0	0	0	0	0	11	15	73.33	1	1
145	2	0	0	2	0	2	31	42	73.81	1	1
148	0	0	0	0	0	2	31	40	77.50	1	1
130	0	0	0	0	0	0	8	10	80.00	1	1
140	0	0	0	1	0	0	12	15	80.00	1	1
126	0	0	0	3	0	1	23	28	82.14	1	1
110	1	0	0	0	1	0	34	41	82.93	1	1
111	0	0	0	1	0	6	38	44	86.36	1	1
147	0	0	0	0	0	2	35	40	87.50	1	1
114	0	0	0	0	0	3	25	28	89.29	1	-
138	0	0	0	1	0	3	10	11	90.91	1	1
137	0	0	0	0	0	3	32	34	94.12	1	1
133	0	0	0	0	0	2	28	28	100.00	1	1

B2 Finiteness and auxiliary use

The following tables summarize data relevant for chapters 4 and 5. For each learner, how many auxiliaries *hat/a* (in combination with a lexical verb form) this learner produced in third person singular contexts is indicated, which was the basis for classifying learners into different groups in the picture selection task. Also indicated is how many third person singular finite and non-finite utterances containing a lexical main verb and a complement were produced by each learner.

B2.1 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of German not producing the auxiliary 'hat' (no-aux group)

Participant	*-t*, second	*-en*, final	*-t*, final	*-en*, second	%	'hat' + V
20	0	2	0	3	0	0
39	0	7	0	1	0	0
44	0	7	0	0	0	0
45	0	15	0	0	0	0
48	0	1	0	0	0	0
53	0	10	0	2	0	0
55	0	1	0	0	0	0
57	0	3	0	1	0	0
61	0	5	2	0	0	0
72	0	3	0	0	0	0
73	0	9	0	1	0	0
50	0	7	2	0	0	0
60	0	1	0	1	0	0
26	1	0	1	12	7	0
62	1	10	0	2	8	0
42	1	3	0	7	9	0
51	1	9	1	0	9	0
52	6	4	2	9	29	0
71	1	2	0	0	33	0
58	4	4	0	3	36	0
37	5	3	2	0	50	0
65	6	1	0	2	67	0
Sum	**26**	**107**	**10**	**44**		**0**
Average	**1.44**	**4.73**	**0.49**	**2.29**	**14**	**0**

B2.2 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of German producing 'the auxiliary 'hat' (aux group)

Participant	*-t*, second	*-en*, final	*-t*, final	*-en*, second	%	'hat' + V
33	0	12	1	4	0	1
43	0	5	2	0	0	1
40	2	6	0	3	18	2
34	4	9	2	1	25	9
49	2	0	2	2	33	1
67	5	7	1	1	36	1
47	3	5	0	0	38	2
32	3	2	0	2	43	1
66	3	0	0	4	43	5
63	3	4	0	0	43	9
70	2	1	0	1	50	12
24	11	5	1	1	61	3
22	10	2	1	3	63	7
64	8	3	0	0	73	1
31	3	0	0	1	75	8
41	6	0	0	2	75	1
27	13	2	0	1	81	1
23	16	0	2	0	89	2
25	34	0	1	0	97	2
30	9	0	0	0	100	1
36	15	0	0	0	100	2
59	8	0	0	0	100	5
29	8	0	0	0	100	7
69	2	0	0	0	100	6
Sum	**170**	**63**	**13**	**26**		**90**
Average	**6.73**	**2.78**	**0.56**	**1.13**	**58**	**3.77**

B2.3 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of French not producing the auxiliary 'a' (no-aux group)

Participant number	fin, second	non-fin, second	fin, final	non-fin, final	% fin, second	'a' + lex V
142	0	1	0	0	0	0
132	0	2	3	0	0	0
144	4	5	0	2	36	0
139	6	8	1	0	40	0
131	7	6	0	0	54	0
124	3	1	0	1	60	0
130	2	1	0	0	67	0
119	13	4	0	0	76	0
112	10	3	0	0	77	0
125	2	0	0	0	100	0
Sum	**47**	**31**	**4**	**3**		**0**
Average	**4.70**	**3.10**	**0.40**	**0.30**	**51**	**0**

B2.4 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of French having produced one instance of the auxiliary ' a' (1 aux group)

Participant number	fin, second	non-fin, second	fin, final	non-fin, final	% fin, second	'a' + lex V
128	0	11	0	1	0	1
146	1	1	2	2	17	1
101	1	4	0	0	20	1
134	5	5	0	0	50	1
140	3	0	1	1	60	1
102	6	3	0	1	60	1
120	11	3	0	0	79	1
148	10	2	0	0	83	1
106	7	1	0	0	88	1
110	14	1	0	0	93	1
Sum	**58**	**31**	**3**	**5**		**10**
Average	**6**	**3**	**0**	**1**	**55**	**1**

B2.5 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of French producing more than one instance of the auxiliary 'a' (aux group)

Participant number	fin, second	non-fin, second	fin, final	non-fin, final	% fin, second	'a' + lex V
108	3	11	0	0	21	6
107	2	4	0	0	33	2
104	4	8	0	0	33	7
121	3	5	0	0	38	5
118	6	9	0	0	40	3
105	5	7	0	0	42	16
123	1	1	0	0	50	2
109	8	8	0	0	50	4
117	5	5	0	0	50	2
141	4	4	0	0	50	4
113	2	2	0	0	50	10
126	2	2	0	0	50	5
129	3	2	0	0	60	2
145	7	4	0	0	64	26
103	5	2	0	0	71	2
116	9	3	0	0	75	5
111	17	4	0	0	81	9
147	13	0	0	0	100	13
138	2	0	0	0	100	23
137	15	0	0	0	100	6
133	4	0	0	0	100	7
Sum	**120**	**81**	**0**	**0**		**159**
Average	**6**	**4**	**0**	**0**	**60**	**7.57**

B2.6 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of French producing less than 55% of finite verbs in second position in verb-complement structures.

Participant number	fin, second	non-fin, second	fin, final	non-fin, final	% fin, second	'a' + lex V
128	0	11	0	1	0	1
132	0	2	3	0	0	0
142	0	1	0	0	0	0
146	1	1	2	2	17	1
101	1	4	0	0	20	1
108	3	11	0	0	21	6
104	4	8	0	0	33	7
107	2	4	0	0	33	2
144	4	5	0	2	36	0
121	3	5	0	0	38	5
118	6	9	0	0	40	3
139	6	8	1	0	40	0
105	5	7	0	0	42	16
109	8	8	0	0	50	4
113	2	2	0	0	50	10
117	5	5	0	0	50	2
123	1	1	0	0	50	2
126	2	2	0	0	50	5
134	5	5	0	0	50	1
141	4	4	0	0	50	4
131	7	6	0	0	54	0
Sum	**69**	**109**	**6**	**5**		**70**
Average	**3.29**	**5.19**	**0.29**	**0.24**	**34.48**	**3.33**

B2.7 Number of finite and non-finite utterances containing a lexical main verb and a complement per learner in the group of learners of French producing more than 60% of finite verbs in second position in verb-complement structures.

Participant number	fin, second	non-fin, second	fin, final	non-fin, final	% fin, second	'a' + lex V
102	6	3	0	1	60	1
124	3	1	0	1	60	0
129	3	2	0	0	60	2
140	3	0	1	1	60	1
145	7	4	0	0	64	26
130	2	1	0	0	67	0
103	5	2	0	0	71	2
116	9	3	0	0	75	5
119	13	4	0	0	76	0
112	10	3	0	0	77	0
120	11	3	0	0	79	1
111	17	4	0	0	81	9
148	10	2	0	0	83	1
106	7	1	0	0	88	1
110	14	1	0	0	93	1
125	2	0	0	0	100	0
133	4	0	0	0	100	7
137	15	0	0	0	100	6
138	2	0	0	0	100	23
147	13	0	0	0	100	13
Sum	**156**	**34**	**1**	**3**		**99**
Average	**7.80**	**1.70**	**0.05**	**0.15**	**79.69**	**4.95**

Appendix C: Items

C1 Imitation and self-paced listening task

C1.1 Auxiliaries, German

1	Die Mutter hat nicht über den dummen Film gelacht.
	'The mother has not laughed about the stupid movie.'
2	Der Bäcker hat nicht mit der hübschen Frau geredet.
	'The baker has not talked to the pretty woman.'
3	Der Koch hat nicht in dem neuen Haus gearbeitet.
	'The cook has not worked in the new house.'
4	Der Nachbar hat nicht mit dem braven Hund gespielt.
	'The neighbour has not played with the friendly dog.'
5	Der Student hat nicht nach der falschen Antwort gefragt.
	'The student has not asked for the wrong answer.'
6	Die Schwester hat nicht nach dem dünnen Buch gesucht.
	'The sister has not searched for the thin book.'
7	Der Kellner hat nicht an das frische Brot gedacht.
	'The waiter has not thought of the fresh bread.'
8	Das Kind hat nicht mit dem tollen Spiel begonnen.
	'The child has not started with the great game.'

C1.2 Lexical verbs, German

1	Der Schüler rennt nicht zu einem anderen Bahnhof.
	'The pupil does not run to an other station.'
2	Der Mann tanzt nicht mit seiner netten Sekretärin.
	'The man does not dance with the nice secretary.'
3	Der Bruder wohnt nicht bei seinen glücklichen Eltern.
	'The brother does not live with his happy parents.'
4	Der Doktor antwortet nicht auf den lieben Brief.
	'The doctor does not answer to the friendly letter.'
5	Der Ausländer wartet nicht auf den späten Zug.
	'The foreigner does not wait for the late train.'
6	Der Lehrer sitzt nicht in einem schönen Büro.
	'The teacher does not sit in a nice office.'
7	Der Präsident lebt nicht in einer fremden Stadt.
	'The president does not live in a foreign city.'
8	Der Junge schreibt nicht an seine traurige Tante.
	'The boy does not write to his sad aunt.'
9	Der Kranke bleibt nicht in einem grossen Krankenhaus.
	'The sick person does not stay in a big hospital.'
10	Der Kapitän steht nicht auf einem weissen Schiff.
	'The capitain does not stand on a white ship.'
11	Das Mädchen geht nicht zu seiner alten Schule.
	'The girl does not go to her old school.'
12	Die Familie kommt nicht aus einem kleinen Dorf.
	'The family does not come from a small village.'

13 Der Arbeiter schläft nicht in seinem warmen Bett.
'The worker does not sleep in his warm bed.'
14 Der Vater läuft nicht durch einen gefährlichen Wald.
'The father does not walk through the dangerous forest.'
15 Der Polizist fährt nicht zu einem schlimmen Unfall.
'The policeman does not drive to a bad accident.'
16 Der Arzt spricht nicht mit seiner wütendem Freundin.
'The (medical) doctor does not talk to his angry friend.'

C1.3 Auxiliaries, French

1 La mère a pas nagé dans la rivière noire.
'The mother has not swum in the black river.'
2 L'homme a pas joué avec le jeune chien.
'The man has not played with the young dog.'
3 Le cuisinier a pas trouvé de chocolat blanc.
'The chef has not found white chocolat.'
4 L'infirmière a pas cherché de bouteilles d'eau.
'The nurse has not fetched the water bottles.'
5 L'étudiant a pas perdu à un jeu de cartes.
'The student has not lost in the card game.'
6 La serveuse a pas souri à sa méchante tante.
'The waitress has not smiled to the nasty aunt.'
7 La sœur a pas vendu de café au lait.
'The sister has not sold coffee with milk.'
8 Le voisin a pas compris de langues etrangères.
'The neighbour has not understood foreign languages.'

C1.4 Lexical verbs ending in -'er', French:

1 L'élève parle pas avec les gentils gens.
'The pupil does not talk to the friendly people.'
2 Le docteur pense pas à son travail difficile.
'The doctor does not think of his difficult work.'
3 Le frère arrive pas dans le village étranger.
'The brother does not arrive in the foreign village.'
4 Le malade reste pas à l'hôpital de Montpellier.
'The sick person does not stay at the hospital in Montpellier.'
5 L'étranger rentre pas de son long voyage.
'The foreigner does not return from his long journey.'
6 Le père travaille pas dans un village important.
'The father does not work in an important village.'
7 Le professeur entre pas dans la salle de travail.
'The teacher does not enter the working room.'
8 Le garçon mange pas dans la nouvelle cuisine.
'The boy does not eat in the new ktichen.'
9 Le capitaine marche pas dans les jolies collines.
'The capitain does not walk in the pretty hills.'

10 L'enfant tombe pas de la très petite fenêtre.
'The child does not fall out of the very small window.'
11 La famille monte pas à la jolie montagne.
'The family does not climb to the pretty mountain.'
12 L'ouvrier danse pas avec la femme de son ami.
'The worker does not dance with the wife of his friend.'
13 La fille chante pas à l'église de Montpellier.
'The girl does not sing in the church at Montpellier.'
14 Le président habite pas dans une petite maison
'The president does not live in a small house.'
15 Le policier fume pas dans son nouveau lit.
'The policeman does not smoke in his new bed.'
16 Le médecin telephone pas à ses chers grands-parents.
'The (medical) doctor phones his dear grand-parents.'

C1.5 Lexical verbs ending in -'ir',-'oir' and 're', French[1]:

1 Le président vient pas de la très petite ville.
'The president does not come from the very small town.'
2 Le docteur meurt pas dans l'accident de voiture
'The doctor does not die in the car accident.'
3 Le frère revient pas de son voyage en voiture.
'The brother does not return from his car journey.'
4 Le professeur part pas de son petit village.
'The teacher does not leave from his little village.'
5 Le père souffre pas de cette maladie dangereuse.
'The father does not suffer from this dangerous illness.'
6 L'ouvrier sort pas de son travail facile.
'The worker does not come from his easy work.'
7 Le malade dort pas dans le lit de son amie.
'The sick person does not sleep in the bed of his friend.'
8 Le garçon court pas à sa nouvelle école.
'The boy does not run to his new school.'
9 L'enfant nait pas dans un hôpital important.
'The child is not born in an important hospital.'
10 L'élève répond pas à la question difficile.
'The pupil does not answer to the difficult question.'

[1] Items 11 and 13 have been excluded from the analysis in the imitation task because the finite form of the verb is homophonous to the past participle.
Note moreover that item 9 is problematic in that the finite form, *nait*, is homophonous to the combination of the preverbal negator *ne* and the light verb *est*: *n'est.* While this item therefore presents an unfortunate choice for the present research question, it cannot have created any artifact for the results as they were found: Finite light verbs and finite lexical verbs in raised positions were not treated differently by the learners of French in the imitation task (both structures were in general repeated as they were and not changed). In the self-paced listening task, postverbal negation was harder to process for lexical verbs than for auxiliaries. However, the advantage of auxiliary sentences is likely due to the fact that a past participle followed the negator, which is not the case in item 9. For these reasons, the item was not removed from the analyses.

(11 La fille rit pas de l'histoire de ses parents.
'The girl does not laugh about her parents' story.')
12 La famille descend pas de la belle montagne.
'The family does not descend from the beatiful mountain.'
(13 Le policier écrit pas à ses chers grands-parents.
'The policeman does not write to his dear grand-parents.')
14 Le capitaine lit pas sur la plage de Marseille.
'The capitain does not read on the beach of Marseille.'
15 L'étranger attend pas à la gare d'Istanboul.
'The foreigner does not wait at the station of Istanboul.'
16 Le médecin vit pas dans une jolie maison.
'The (medical) doctor does not live in a pretty house.

C2 Picture selection task

C2.1 Overview of conditions

Condition		Utterances	Expected picture
	A:	Glaubst du, dass Peter einen Tisch baut? 'Do you think that Peter builds a table?'	
1: finite, falling intontation	B1:	Peter baut einen Tisch. Peter build-t *(fin)* a table.	1
2: infinite, falling intonation	B2:	Peter einen Tisch bauen. Peter a table build-en *(inf)*.	?
3: finite, rising intonation	B3:	Peter? baut einen Tisch? Peter? build-t *(fin)* a table?	?
4: infinite, rising intonation	B4:	Peter? einen Tisch bauen? Peter? a table build-en *(inf)*?	?
5: uncertain	B5:	Ich weiss nicht, ob Peter einen Tisch baut. I know not , if Peter a table build-t *(fin)*.	2
6: completed	B6:	Peter hat einen Tisch gebaut. Peter has a table *ge*-build-*t (PP)*.	3

All conditions for the item "Peter baut einen Tisch"

C2.2 Items

Items 1-3:	Peter / Jan / Anne malt eine Blume.
	Pierre / Jean / Anne peint une fleur.
	Peter / Jan / Anne paints a flower.
Items 4-6:	Peter / Jan / Anne schreibt einen Brief.
	Pierre / Jean / Anne écrit une lettre.
	Peter / Jan / Anne writes a letter.
Items 7-9:	Peter / Jan / Anne liest einen Brief.
	Pierre / Jean / Anne lit une lettre.
	Peter / Jan / Anne reads a letter.
Items 10-12:	Peter / Jan / Anne stellt die Gläser auf den Tisch.
	Pierrre / Jean / Anne met les verres sur la table.
	Peter / Jan / Anne puts the glasses on the table.
Items 13-15:	Peter / Jan / Anne baut einen Tisch.
	Pierre / Jean / Anne construit une table
	Peter / Jan / Anne constructs a table.
Items 16-18:	Peter / Jan / Anne öffnet eine Dose.
	Pierre / Jean / Anne ouvre une boîte.
	Peter / Jan / Anne opens a can.
Itms 19 and 20:	Jan / Anne nimmt ein Bad.
	Jean / Anne prend un bain.
	Jan / Anne takes a bath.

Appendix D: Results self-paced listening task

D1 Raw reaction times

The values reported below are cleaned in the same way as the residual listening times reported in the text. This means that only reactions between 0 and 4000 msec after the end of a segment were taken into account. All reaction times that were outside 2 standard deviations of the group mean for a given segment were removed from analysis. The reaction times that were the basis for computing the residual reaction times reported in the text were measured from the onset of each segment. As for some conditions and segments, there were differences between the duration of segments in different conditions (in particular, the verb-negator segment is often longer in conditions 2 and 4, containing the infinitival form of the verb, than in conditions 1 and 3, containing the finite form, and the reverse is true for the object segments, see footnote 37 in chapter 2), the reaction times measured from the offset of each segment, which are closer to the residual listening times, are reported as well.

D1.1 Lexical verbs German

D1.1.1 Native speakers

	Subject (Der Junge)	Verb/negator (schreibt nicht)	Preposition (an)	Object (seine Tante)
1: fin + neg	1472 (268)	1920 (376)	963 (222)	2206 (514)
2: inf + neg	1429 (250)	2086 (328)	962 (212)	2090 (548)
3: neg + fin	1443 (271)	1935 (342)	968 (243)	2237 (587)
4: neg + inf	1416 (292)	1989 (368)	955 (226)	2188 (710)

*Mean raw listening times (sd) for the different segments for native speakers of German, measured from **onset** of segments*

	Subject (Der Junge)	Verb/negator (schreibt nicht)	Preposition (an)	Object (seine Tante)
1: fin + neg	578 (264)	886 (358)	801 (218)	762 (452)
2: inf + neg	548 (248)	1029 (342)	789 (221)	860 (521)
3: neg + fin	556 (284)	887 (330)	806 (256)	828 (545)
4: neg + inf	569 (282	899 (362)	759 (239)	936 (696)

*Mean raw listening times (sd) for the different segments for native speakers of German measured from **offset** of segments*

D1.1.2 Learners

	Subject (Der Junge)	Verb/negator (schreibt nicht)	Preposition (an)	Object (seine Tante)
1: fin + neg	1718 (422)	2431 (257)	1138 (257)	2615 (854)
2: inf + neg	1653 (403)	2425 (261)	1128 (261)	2340 (743)
3: neg + fin	1662 (413)	2326 (254)	1108 (254)	2613 (775)
4: neg + inf	1640 (386)	2488 (234)	1086 (234)	2347 (745)

*Mean raw listening times (sd) for the different segments for learners of German, measured from **onset** of segments*

	Subject (Der Junge)	Verb/negator (schreibt nicht)	Preposition (an)	Object (seine Tante)
1: fin + neg	824 (392)	1388 (619)	983 (266)	1176 (820)
2: inf + neg	770 (417)	1354 (601)	960 (270)	1106 (714)
3: neg + fin	782 (408)	1285 (542)	943 (265)	1190 (760)
4: neg + inf	797 (385)	1403 (593)	899 (251)	1094 (724)

*Mean raw listening times (sd) for the different segments for learners of German, measured from **offset** of segments*

D1.2 Lexical verbs French

1.2.1 Verbs ending in -er:

D1.2.1.1 Native speakers

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	1465 (324)	2141 (568)	968 (287)	2072 (472)
2: inf + neg	1406 (306)	2210 (602)	979 (288)	1930 (431)
3: neg + fin	1454 (318)	2337 (601)	975 (258)	2115 (565)
4: neg + inf	1404 (275)	2274 (575)	957 (283)	2028 (528)

*Mean raw listening times (sd) for the different segments for native speakers of French from **onset** of segments*

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	648 (309)	1465 (569)	824 (305)	897 (433)
2: inf + neg	626 (251)	1585 (605)	836 (297)	815 (400)
3: neg + fin	661 (285)	1693 (597)	841 (270)	918 (504)
4: neg + inf	667 (270)	1622 (559)	833 (279)	855 (486)

*Mean raw listening times (sd) for the different segments for native speakers of French from **offset** of segments*

D1.2.1.2 Learners

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	1525 (349)	2136 (495)	1004 (255)	2194 (548)
2: inf + neg	1491 (337)	2255 (503)	991 (266)	2110 (582)
3: neg + fin	1528 (329)	2283 (481)	1017 (257)	2166 (599)
4: neg + inf	1473 (333)	2271 (479)	1005 (267)	2061 (589)

*Mean raw listening times (sd) for the different segments for learners of French from **onset** of segments*

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	700 (302)	1478 (514)	852 (263)	1020 (518)
2: inf + neg	726 (321)	1645 (520)	851 (263)	979 (530)
3: neg + fin	745 (321)	1643 (486)	857 (242)	985 (587)
4: neg + inf	732 (302)	1642 (496)	874 (268)	884 (498)

*Mean raw listening times (sd) for the different segments for learners of French from **offset** of segments*

D.1.2.2 Verbs ending in -ir/-oir and -re:

D.1.2.2.1 Native speakers

	Subject (Le policier)	**Verb/negator (écrit pas)**	**Preposition (à)**	**Object (ses grands-parents)**
1: fin + neg	1521 (295)	2128 (663)	969 (266)	2297 (505)
2: inf + neg	1455 (263)	2306 (598)	984 (291)	2291 (587)
3: neg + fin	1506 (283)	2322 (702)	1021 (305)	2349 (594)
4: neg + inf	1469 (260)	2345 (614)	1009 (284)	2230 (616)

*Mean raw listening times (sd) for the different segments for native speakers of French from **onset** of segments*

	Subject (Le policier)	**Verb/negator (écrit pas)**	**Preposition (à)**	**Object (ses grands-parents)**
1: fin + neg	630 (244)	1569 (665)	840 (270)	869 (424)
2: inf + neg	599 (240)	1587 (589)	859 (306)	914 (506)
3: neg + fin	650 (259)	1768 (670)	910 (313)	956 (528)
4: neg + inf	644 (258)	1616 (635)	882 (285)	913 (543)

*Mean raw listening times (sd) for the different segments for native speakers of French from **offset** of segments*

D.1.2.2.2 Learners

	Subject (Le policier)	**Verb/negator (écrit pas)**	**Preposition (à)**	**Object (ses grands-parents)**
1: fin + neg	1628 (307)	2269 (593)	1046 (279)	2568 (611)
2: inf + neg	1552 (307)	2374 (583)	1034 (289)	2528 (636)
3: neg + fin	1585 (342)	2376 (606)	1064 (289)	2419 (613)
4: neg + inf	1557 (304)	2480 (571)	1055 (277)	2396 (655)

*Mean raw listening times (sd) for the different segments for learners of French from **onset** of segments*

	Subject (Le policier)	**Verb/negator (écrit pas)**	**Preposition (à)**	**Object (ses grands-parents)**
1: fin + neg	775 (323)	1680 (585)	922 (290)	1149 (601)
2: inf + neg	743 (333)	1659 (579)	920 (308)	1148 (573)
3: neg + fin	759 (357)	1825 (555)	944 (300)	1070 (525)
4: neg + inf	736 (323)	1777 (603)	932 (288)	1026 (539)

*Mean raw listening times (sd) for the different segments for learners of French from **offset** of segments*

D1.3 Auxiliaries

D1.3.1 German:

D.1.3.1.1 Native speakers

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	1390 (331)	1821 (319)	922 (207)	1488 (228)	1424 (383)
2: neg+ aux	1361 (339)	1828 (318)	910 (227)	1482 (204)	1473 (294)

*Mean raw listening times (sd) for the different segments for native speakers of German from **onset** of segments*

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	484 (260)	980 (333)	682 (190)	438 (164)	712 (389)
2: neg+ aux	553 (294)	1006 (317)	674 (211)	474 (150)	784 (369)

*Mean raw listening times (sd) for the different segments for native speakers of German from **offset** of segments*

D1.3.1.2 Learners

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	1652 (395)	2288 (578)	1118 (274)	1801 (356)	1696 (483)
2: neg+ aux	1574 (382)	2239 (534)	1078 (264)	1735 (311)	1649 (488)

*Mean raw listening times (sd) for the different segments for learners of German from **onset** of segments*

	Subject (Das Kind)	**Verb/negator (hat nicht)**	**Preposition (mit)**	**Object (dem Spiel)**	**Past participle (begonnen)**
1: aux + neg	778 (394)	1522 (725)	885 (284)	733 (322)	1005 (500)
2: neg+ aux	780 (370)	1528 (765)	848 (268)	740 (307)	988 (496)

*Mean raw listening times (sd) for the different segments for learners of German from **offset** of segments*

D1.3.2 French:

D1.3.2.1 Native speakers

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	1549 (321)	2087 (607)	1092 (168)	1006 (253)	1993 (451)
2: neg+ aux	1459 (315)	2126 (618)	1118 (159)	1005 (283)	2011 (528)

*Mean raw listening times (sd) for the different segments for native speakers of French from **onset** of segments*

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	673 (273)	1841 (608)	712 (312)	869 (252)	932 (407)
2: neg+ aux	665 (279)	1847 (632)	889 (439)	862 (293)	1034 (473)

*Mean raw listening times (sd) for the different segments for native speakers of French from **offset** of segments*

D1.3.2.2 Learners

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	1618 (379)	2198 (557)	1362 (355)	1090 (273)	2181 (564)
2: neg+ aux	1573 (369)	2163 (546)	1464 (396)	1109 (290)	2026 (556)

*Mean raw listening times (sd) for the different segments for learners of French from **onset** of segments*

	subject (L'homme)	**verb/negator (a pas)**	**past participle (joué)**	**preposition (avec)**	**object (le chien)**
1: aux + neg	742 (337)	1952 (555)	806 (352)	952 (281)	1126 (546)
2: neg+ aux	781 (322)	1867 (546)	949 (396)	967 (303)	1051 (502)

*Mean raw listening times (sd) for the different segments for learners of French from **offset** of segments*

D2 Listening times to verb and negator

D2.1 Lexical verbs German

D.2.1.1 Native speakers

	residual		raw (onset)		raw (offset)	
	verb	**negator**	**verb**	**negator**	**verb**	**negator**
1: fin + neg	-186 (145)	-144 (160)	978 (184)	916 (184)	393 (170)	464 (186)
2: inf + neg	-111 (154)	-87 (164)	1075 (169)	988 (205)	489 (176)	512 (198)
3: neg + fin	-168 (133)	-145 (158)	980 (189)	960 (196)	435 (162)	459 (193)
4: neg + inf	-182 (140)	-113 (158)	1013 (185)	959 (188)	419 (174)	464 (194)

Listening times (sd) to the verb and the negator for native speakers of German

D.2.1.2 Learners

	residual		raw (onset)		raw (offset)	
	verb	**negator**	**verb**	**negator**	**verb**	**negator**
1: fin + neg	-182 (270)	-173 (243)	1289 (355)	1123 (299)	698 (357)	662 (297)
2: inf + neg	-197 (262)	-173 (274)	1255 (317)	1136 (316)	645 (307)	669 (321)
3: neg + fin	-221 (268)	-200 (249)	1169 (321)	1149 (295)	611 (293)	647 (291)
4: neg + inf	-182 (280)	-181 (242)	1260 (316)	1182 (303)	677 (313)	685 (308)

Listening times (sd) to the verb and the negator for learners of German

D2.2 Lexical verbs French

D.2.2.1 Verbs ending in -er:

D.2.2.1.1 Native speakers

	residual		raw (onset)		raw (offset)	
	verb	negator	verb	negator	verb	negator
1: fin + neg	-138 (168)	3 (194)	1118 (284)	1015 (316)	661 (285)	796 (317)
2: inf + neg	-70 (183)	34 (219)	1181 (288)	1017 (340)	720 (283)	844 (343)
3: neg + fin	-30 (217)	108 (209)	1238 (310)	1080 (335)	741 (304)	918 (317)
4: neg + inf	-82 (194)	100 (193)	1196 (294)	1046 (305)	700 (294)	912 (307)

Listening times (sd) to the verb and the negator for native speakers of French

D.2.2.1.2 Learners

	residual		raw (onset)		raw (offset)	
	verb	negator	verb	negator	verb	negator
1: fin + neg	-203 (230)	-113 (210)	1172 (302)	987 (258)	714 (304)	768 (259)
2: inf + neg	-155 (229)	-56 (214)	1207 (276)	1020 (271)	759 (283)	842 (269)
3: neg + fin	-172 (267)	-13 (208)	1244 (288)	1022 (264)	751 (293)	879 (265)
4: neg + inf	-165 (235)	-9 (212)	1261 (310)	1024 (273)	743 (294)	891 (273)

Listening times (sd) to the verb and the negator for learners of French

D.2.2.2 Verbs ending in -ir, -oir or -re:

D.2.2.2.1 Native speakers

	residual		raw (onset)		raw (offset)	
	verb	negator	verb	negator	verb	negator
1: fin + neg	-45 (196)	-23 (209)	1115 (350)	982 (318)	772 (339)	765 (332)
2: inf + neg	-75 (210)	0 (199)	1238 (292)	1016 (289)	714 (269)	811 (292)
3: neg + fin	38 (252)	107 (218)	1198 (335)	1050 (327)	820 (338)	910 (325)
4: neg + inf	-28 (263)	107 (191)	1317 (359)	1050 (342)	723 (367)	890 (314)

Listening times (sd) to the verb and the negator for native speakers of French

D.2.2.2.2 Learners

	residual		raw (onset)		raw (offset)	
	verb	negator	verb	negator	verb	negator
1: fin + neg	-86 (235)	-91 (243)	1190 (333)	1037 (269)	860 (335)	824 (286)
2: inf + neg	-145 (230)	-45 (241)	1284 (295)	1058 (304)	772 (290)	854 (304)
3: neg + fin	-74 (257)	35 (152)	1244 (362)	1075 (269)	860 (342)	935 (269)
4: neg + inf	-85 (294)	29 (233)	1408 (359)	1070 (296)	832 (383)	934 (286)

Listening times (sd) to the verb and the negator for learners of French

D2.3 Auxiliaries

D.2.3.1 German:

D.2.3.1.1 Native speakers

	residual		raw (onset)		raw (offset)	
	auxiliary	**negator**	**auxiliary**	**negator**	**auxiliary**	**negator**
1: aux+ neg	-89 (146)	-155 (144)	899 (172)	930 (188)	506 (166)	455 (194)
2: neg + aux	-90 (143)	-117 (137)	898 (186)	932 (179)	510 (177)	490 (177)

Listening times (sd) to the auxiliary and the negator for native speakers of German

D.2.3.1.2 Learners

	residual		raw (onset)		raw (offset)	
	auxiliary	**negator**	**auxiliary**	**negator**	**auxiliary**	**negator**
1: aux+ neg	-41 (207)	-94 (231)	1119 (298)	1109 (293)	735 (301)	683 (354)
2: neg + aux	-72 (186)	-78 (211)	1095 (283)	1129 (275)	718 (282)	707 (301)

Listening times (sd) to the auxiliary and the negator for learners of German

D.2.3.2 French:

D.2.3.2.1 Native speakers

	residual		raw (onset)		raw (offset)	
	auxiliary	**negator**	**auxiliary**	**negator**	**auxiliary**	**negator**
1: aux+ neg	102 (182)	81 (178)	1032 (298)	1026 (321)	912 (288)	883 (313)
2: neg + aux	118 (188)	88 (197)	1072 (336)	1053 (317)	949 (330)	873 (317)

Listening times (sd) to the auxiliary and the negator for native speakers of French

D.2.3.2.2 Learners

	residual		raw (onset)		raw (offset)	
	auxiliary	**negator**	**auxiliary**	**negator**	**auxiliary**	**negator**
1: aux+ neg	138 (243)	32 (219)	1109 (292)	1036 (273)	997 (294)	901 (269)
2: neg + aux	133 (232)	5 (195)	1110 (331)	1065 (270)	995 (333)	885 (269)

Listening times (sd) to the auxiliary and the negator for learners of French

D3 Proficiency split

The following tables present the self-paced listening data presented in chapter 2 split up for the two proficiency levels in each language. Although the overall pattern is similar across proficiency levels, there are influences of proficiency in the sense that the effects are most of the time stronger in the less proficient groups. But the more proficient groups do not in most cases show any clear tendency in a different direction; they mostly show similar preferences or no preferences. This is particularly true for the learners of French. The two proficiency groups in the learners of German also behave similarly to each other in that the general preference for preverbal negation which can be measured on the preposition is present in both groups. On the object, however, the more advanced learners process sentences with raised verbs faster if the verb is finite, and sentences with unraised verbs faster if the verb is non-finite, whereas no such interaction can be observed for the less advanced learners. This might be taken as a sign of a stronger influence of syntactic constraints in the more advanced learners in German when compared to the less advanced ones. Interestingly, this kind of difference between proficiency levels can not be observed in French. The cross-linguistic difference appearing in the results of this task is thus similar to the differences found with other tasks (see chapter 3 and 5).

D3.1 Lexical verbs German

D.3.1.1 low-agr group

	Subject (Der Junge)	**Verb/negator (schreibt nicht)**	**Preposition (an)**	**Object (seine Tante)**
1: fin + neg	-79 (352)	-385 (411)	200 (288)	102 (502)
2: inf + neg	-134 (348)	-362 (448)	177 (231)	34 (485)
3: neg + fin	-114 (333)	-359 (434)	100 (238)	79 (477)
4: neg + inf	-80 (322)	-324 (425)	81(246)	-4 (485)

Mean residual listening times (sd) for the different segments in learners in the low-agr group.

D.3.1.2 high-agr group

	Subject (Der Junge)	**Verb/negator (schreibt nicht)**	**Preposition (an)**	**Object (seine Tante)**
1: fin + neg	-89 (305)	-295.94 (426)	203 (237)	46 (507)
2: inf + neg	-166 (360)	-333.28 (410)	180 (265)	122 (475)
3: neg + fin	-140 (341)	-413.62 (399)	140 (214)	164 (526)
4: neg + inf	-157 (329)	-314.14 (387)	113 (218)	28 (425)

Mean residual listening times (sd) for the different segments in learners in the high-agr group.

D3.2 Lexical verbs French

D.3.2.1. Verbs ending in -er:

D.3.2.1.1 low-agr group

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	-17 (219)	-336 (275)	-17 (219)	70 (372)
2: inf + neg	-14 (224)	-199 (360)	-14 (224)	66 (414)
3: neg + fin	14 (210)	-129 (391)	14 (210)	-26 (427)
4: neg + inf	6 (200)	-120 (366)	6 (200)	-52 (409)

Mean residual listening times (sd) for the different segments in learners in the low-agr group.

D.3.2.1.2. high-agr group

	Subject (Le garçon)	Verb/negator (mange pas)	Preposition (dans)	Object (la cuisine)
1: fin + neg	18 (185)	-269 (375)	18 (185)	119 (478)
2: inf + neg	6 (184)	-142 (405)	6 (184)	104 (503)
3: neg + fin	-36 (207)	-198 (404)	-36 (207)	127 (486)
4: neg + inf	17 (191)	-161 (409)	17 (191)	-19 (333)

Mean residual listening times (sd) for the different segments in learners in the high-agr group.

D.3.2.2 Verbs ending in -ir/-oir and -re:

D.3.2.2.1 low-agr group

	Subject (Le policier)	Verb/negator (écrit pas)	Preposition (à)	Object (ses grands-parents)
1: fin + neg	-133 (317)	-80 (443)	80 (238)	219 (464)
2: inf + neg	-196 (253)	-119 (416)	98 (236)	298 (517)
3: neg + fin	-203 (321)	16 (388)	72 (234)	141 (419)
4: neg + inf	-161 (302)	31 (458)	62 (238)	89 (445)

Mean residual listening times (sd) for the different segments in learners in the low-agr group.

D.3.2.2.2. high-agr-group

	Subject (Le policier)	Verb/negator (écrit pas)	Preposition (à)	Object (ses grands-parents)
1: fin + neg	-149 (297)	-260 (359)	30 (207)	174 (522)
2: inf + neg	-160 (299)	-219 (405)	36 (201)	174 (528)
3: neg + fin	-145 (276)	-45 (406)	29 (206)	103 (495)
4: neg + inf	-163 (306)	-122 (447)	40 (191)	102 (439)

Mean residual listening times (sd) for the different segments in learners in the high-agr group.

D3.3 Auxiliaries

D.3.3.1 German:

D.3.3.1.1 low-agr group

	Subject (Das Kind)	Verb/negator (hat nicht)	Preposition (mit)	Object (dem Spiel)	Past participle (begonnen)
1: aux + neg	-86 (332)	-187 (471)	57 (226)	-140 (347)	81 (442)
2: neg+ aux	-91 (344)	-250 (392)	17 (245)	-174 (302)	162 (440)

Mean residual listening times (sd) for the different segments in learners in the low-agr group.

D.3.3.1.2 high-agr group

	Subject (Das Kind)	Verb/negator (hat nicht)	Preposition (mit)	Object (dem Spiel)	Past participle (begonnen)
1: aux + neg	-164 (326)	-311 (355)	66 (210)	-207 (308)	155 (419)
2: neg + aux	-134 (337)	-276 (397)	40 (223)	-193 (330)	73 (404)

Mean residual listening times (sd) for the different segments in learners in the high-agr group.

D.3.3.2 French:

D.3.3.2.1 low-agr group

	subject (L'homme)	verb/negator (a pas)	past participle (joué)	preposition (avec)	object (le chien)
1: aux + neg	-189 (301)	146 (394)	-77 (268)	140 (235)	218 (515)
2: neg+ aux	-160 (322)	140 (425)	24 (262)	128 (219)	145 (397)

Mean residual listening times (sd) for the different segments in learners in the low-agr group

D.3.3.2.2 high-agr group

	subject (L'homme)	verb/negator (a pas)	past participle (joué)	preposition (avec)	object (le chien)
1: aux + neg	-145 (332)	83 (425)	-74 (306)	52 (202)	231 (476)
2: neg+ aux	-46 (330)	10 (397)	24 (361)	64 (229)	144 (416)

Mean residual listening times (sd) for the different segments in learners in the high-agr group

Appendix E: Results picture selection tasks

E.1 Results in the picture selection task for native speakers and learners of German: Percentages of picture chosen per condition (absolute numbers of choices in parentheses). Pic A = assertion picture, Pic O = open picture, Pic C = completed picture.

Group	no-aux			aux			natives		
Condition	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C
1: Finite, falling	69.32 (61/88)	5.68 (5/88)	25.00 (22/88)	69.79 (67/96)	04.17 (4/96)	26.04 (25/96)	87.5 (63/72)	2.78 (2/72)	9.72 (7/72)
2: Non-finite, falling	81.82 (72/88)	7.95 (7/88)	10.23 (9/88)	67.71 (65/96)	12.50 (12/96)	19.79 (19/96)	61.11 (44/72)	25.00 (18/72)	13.89 (10/72)
3: Doubt	35.23 (31/88)	48.86 (43/88)	15.91 (14/88)	10.42 (10/96)	65.62 (63/96)	23.96 (23/96)	30.88 (21/68[x])	57.35 (39/68[x])	11.76 (8/68[x])
4: Completed	51.14 (45/88)	9.09 (8/88)	39.77 (35/88)	30.21 (29/96)	09.38 (9/96)	60.42 (58/96)	20.00 (14/70[x])	5.71 (4/70[x])	74.29 (52/70[x])
5: Finite, rising	59.09 (26/44)	29.55 (13/44)	11.36 (5/44)	39.58 (19/48)	43.75 (21/48)	16.67 (8/48)	52.78 (19/36)	33.33 (12/36)	13.89 (5/36)
6: Non-finite, rising	61.36 (27/44)	20.45 (9/44)	18.18 (8/44)	35.42 (17/48)	52.08 (25/48)	12.50 (6/48)	41.67 (15/36)	55.56 (20/36)	2.78 (1/36)

[x] Cases missing from 72 were excluded because there was an error in one of the presented pictures.

E.2 Results in the picture selection task for native speakers and learners of French (no-aux/aux group): Percentages of picture chosen per condition (absolute numbers of choices in parentheses) PicA = assertion picture, Pic O = open picture, Pic C = completed picture. No-aux- group = learners who produced no or only one auxliary, aux group = learners who produced more than one auxiliary.

Group	no-aux (zero or one)			aux (more than one)			natives		
Condition	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C
1: Finite, falling	77.5 (62/80)	5 (4/80)	17.5 (14/80)	65.48 (55/84)	11.9 (10/84)	22.62 (19/84)	97.72 (70/72)	1.4 (1/72)	1.4 (1/72)
2: Non-finite, falling	66.25 (53/80)	10 (8/80)	23.75 (19/80)	76.19 (64/84)	4.76 (4/84)	19.05 (16/84)	65.28 (47/72)	26.39 (19/72)	8.33 (6/72)
3: Doubt	16.25 (13/80)	72.5 (58/80)	11.25 (9/80)	7.14 (6/84)	76.19 (64/84)	16.67 (14/84)	12.5 (9/72)	77.78 (56/72)	9.72 (7/72)
4: Completed	53.75 (43/80)	6.25 (5/80)	40 (32/80)	35.71 (30/84)	11.9 (10/84)	52.38 (44/84)	12.5 (9/72)	11.11 (8/72)	76.39 (55/72)
5: Finite, rising	62.5 (25/40)	32.5 (13/40)	5 (2/40)	57.14 (24/42)	16.67 (7/42)	26.19 (11/42)	33.33 (12/36)	52.78 (19/36)	13.89 (5/36)
6: Non-finite, rising	70 (28/40)	17.5 (7/40)	12.5 (5/40)	59.52 (25/42)	23.81 (10/42)	16.67 (7/42)	25 (9/36)	69.44 (25/36)	5.56 (2/36)

E.3 Results in the picture selection task for no-aux and 1-aux group in the learners of French: Percentages of picture chosen per condition (absolute numbers of choices in parentheses) PicA = assertion picture, Pic O = open picture, Pic C = completed picture. No-aux group = learners who produced no auxliary, 1-aux group = learners who produced exactly one auxiliary.

Group	no-aux (zero aux)			one aux		
Condition	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C
1: Finite, falling	61.25 (30/40)	12.5 (2/40)	26.25 (8/40)	82.5 (32/40)	5 (2/40)	12.5 (6/40)
2: Non-finite, falling	68.75 (24/40)	7.5 (4/40)	23.75 (12/40)	72.5 (29/40)	10 (4/40)	17.5 (7/40)
3: Doubt	7.5 (3/40)	82.5 (33/40)	10 (4/40)	25 (10/40)	62.5 (25/40)	12.5 (5/40)
4: Completed	52.5 (21/40)	2.5 (1/40)	45 (18/40)	55 (22/40)	10 (4/40)	35 (14/40)
5: Finite, rising	60 (12/20)	30 (6/20)	10 (2/20)	65 (13/20)	35 (7/20)	0 (0/20)
6: Non-finite, rising	75 (15/20)	15 (3/20)	10 (2/20)	65 (13/20)	20 (4/20)	15 (3/20)

E.4 Results in the picture selection task for 'low-finite' and 'high-finite' learners of French: Percentages of picture chosen per condition (absolute numbers of choices in parentheses) PicA = assertion picture, Pic O = open picture, Pic C = completed picture.

Group	Low finite			High finite		
Condition	Pic A	Pic O	Pic C	Pic A	Pic O	Pic C
1: Finite, falling	60.71 (51/84)	11.9 (10/84)	27.38 (23/84)	82.5 (66/80)	5 (4/80)	12.5 (10/80)
2: Non-finite, falling	69.05 (58/84)	7.14 (6/84)	23.81 (20/84)	73.75 (59/80)	7.5 (6/80)	18.75 (15/80)
3: Doubt	17.86 (15/84)	75 (63/84)	7.14 (6/84)	5 (4/80)	73.75 (59/80)	21.25 (17/80)
4: Completed	58.33 (49/84)	14.29 (12/84)	27.38 (23/84)	30 (24/80)	3.75 (3/80)	66.25 (53/80)
5: Finite, rising	64.29 (27/42)	16.67 (7/42)	19.05 (8/42)	55 (22/40)	32.5 (13/40)	12.5 (5/40)
6: Non-finite, rising	69.05 (29/42)	11.9 (5/42)	19.05 (8/42)	60 (24/40)	30 (12/40)	10 (4/40)

.

Samenvatting in het Nederlands

Twee gesprekspartners met dezelfde moedertaal kunnen in deze taal op een heel efficiënte manier met elkaar communiceren. De spreker zet een bepaalde betekenis of boodschap om in een reeks geluiden en de luisteraar kan uit deze geluiden een betekenis afleiden. Dit proces is alleen mogelijk doordat beide gesprekspartners over kennis beschikken over de relatie tussen betekenissen (of functies) en vormen in deze specifieke taal en omdat ze die kennis met grote snelheid kunnen inzetten. Deze processen vinden zo automatisch en moeiteloos plaats dat sprekers zich er meestal niet van bewust zijn hoeveel gedeelde kennis daarvoor nodig is. Als men echter een conversatie hoort in een vreemde taal wordt meteen duidelijk dat er veel kennis nodig is om uitingen in deze taal te begrijpen of te produceren. Hoe verwerven tweedetaalleerders deze kennis? En hoe doen ze dit in situaties waarin ze geen of weinig expliciete instructie in de tweede taal krijgen?

Deze vragen stonden centraal binnen een groot Europees onderzoeksproject, waarin de verwerving van verschillende Europese doeltalen door volwassen immigranten werd onderzocht (Perdue, 1993). In dit project werd de productie van tweedetaalleerders in een aantal verschillende doeltalen met elkaar vergeleken. Er werd geconstateerd dat er drie ontwikkelingsfasen bestaan, die onafhankelijk van de moedertaal van de leerders in verschillende doeltalen op elkaar lijken (Klein and Perdue, 1992). Kenmerkend voor de drie fasen is het verschillende gebruik van werkwoorden. In de eerste fase gebruiken leerders weinig werkwoorden: hun uitingen bestaan vooral uit substantieven en adjectieven. In de tweede fase worden er wel werkwoorden gebruikt, maar er ontbreekt een belangrijke eigenschap: de werkwoorden in deze fase zijn niet gemarkeerd voor finietheid. Dit ontbreken van finietheid houdt een aantal zaken in. Ten eerste zijn werkwoorden niet morfologisch finiet, wat wil zeggen dat leerders zogenaamde *default*-vormen gebruiken: werkwoorden die dezelfde vorm aannemen, onafhankelijk van de context (bijv. ‘hij lopen’, ‘jij lopen’). Ten tweede staan werkwoorden op een syntactisch niet finiete plaats in de zin, bijvoorbeeld in de eindpositie in plaats van in tweede positie. Een Nederlandse niet finiete zin is bijvoorbeeld "Sanne niet lopen", de finiete versie van deze zin is "Sanne loopt niet". Ten slotte betekent het gebrek aan finietheid in de tweede verwervingsfase ook dat leerders de functies die finietheid in de doeltaal vervult op een andere manier moeten uitdrukken. Pas in de derde fase, die overigens niet door alle leerders bereikt wordt, gebruiken leerders finiete werkwoorden.

In dit proefschrift wordt de overgang van de tweede (niet finiete) fase naar de derde (finiete) fase bij Turkse volwassenen die Duits of Frans als tweede taal verwerven

onderzocht. Daarbij staan drie vragen centraal: Wat is de kennis die leerders bezitten over de formele (morfologische en syntactische) eigenschappen van finietheid? Wat is de kennis die leerders hebben over de functie van finietheid in een zin? Bestaan er verschillen in de aard van de verwervingsprocessen tussen de twee onderzochte doeltalen, Duits en Frans? Deze vragen zijn onderzocht in een zogenaamd *cross-sectional design*. Er werden ongeveer vijftig leerders van iedere taal onderzocht, die verschillende niveaus hadden bereikt in de overgang van de niet finiete naar de finiete fase. In tegenstelling tot eerder onderzoek werd daarbij niet alleen taalproductie onderzocht, maar ook taalperceptie en taalbegrip. Door het combineren van verschillende methoden is het beeld dat van de kennis van finietheid ontstaat vollediger en genuanceerder dan wanneer slechts één methode zou zijn gebruikt.

In het eerste deel van het proefschrift, de hoofdstukken 2 en 3, wordt de kennis onderzocht die leerders over de formele eigenschappen van finietheid hebben. Er wordt onderzocht of leerders weten dat werkwoorden in de doeltaal moeten worden vervoegd en dat deze finiete werkwoorden op een bepaalde positie in de zin moeten staan. Om dit te onderzoeken worden ontkennende zinnen gebruikt, zoals de zinnen die hierboven zijn genoemd. In ontkennende zinnen is het goed mogelijk de positie van het werkwoord te bepalen: als het werkwoord links van het woord van ontkenning verschijnt ("Sanne loopt niet"), neemt het een finiete positie in de zin in. Als het werkwoord rechts van dit woord staat ("Sanne niet lopen"), neemt het een niet finiete positie in. In hoofdstuk 2 wordt de productie van ontkennende zinnen onderzocht en wordt er gekeken hoe leerders dit soort zinnen in hun comprehensie verwerken. Daarvoor wordt een *self-paced listening* taak gebruikt, die het mogelijk maakt om op verschillende plekken in een zin te meten hoeveel moeite leerders hebben met de verwerking van de verschillende zinsdelen. De resultaten in de productie van leerders laten zien dat ze zowel finiete als niet finiete zinnen gebruiken. Uit de taalverwerkingsdata blijkt echter dat niet finiete zinnen gemakkelijker te verwerken zijn. De verklaring die hiervoor wordt gegeven is dat niet finiete ontkennende zinnen semantisch transparanter zijn dan finiete ontkennende zinnen. In een finiete zin staat het ontkenningswoord (‘pas’ in het Frans, ‘nicht’ in het Duits), dat meestal betrekking heeft op het werkwoord, meestal voor dit werkwoord. Dit is een transparantere volgorde dan wanneer de ontkenning na het werkwoord zou staan. In eerder onderzoek werd aangenomen dat dergelijke semantische principes een grote rol spelen in de taal van leerders in de niet finiete fase (Becker, 2005; Klein and Perdue, 1992). De resultaten van hoofdstuk 2 bevestigen deze aanname en laten zien dat de invloed van semantische principes in comprehensie mogelijk nog groter is dan in productie. Dit zou kunnen komen doordat de focus in comprehensie op het begrijpen van de semantische aspecten van een zin ligt en niet per se op de grammaticale vorm ervan. Echter, wanneer men een zin moet produceren, speelt grammaticaliteit mogelijk een grotere rol. Het is dus nuttig om naast de in hoofdstuk

2 beschreven *self-paced listening*-taak een taak te gebruiken die de grammaticale kennis van leerders meet wanneer leerders zelf zinnen moeten produceren.

In het derde hoofdstuk wordt daarom een imitatietaak gebruikt (Verhagen, 2005, 2009). In deze imitatietaak luisterden leerders naar zinnen waarin het werkwoord in een finiete of in een niet finiete positie stond en werd hun gevraagd om de zinnen te herhalen. De zinnen waren te lang om gemakkelijk te onthouden met als gevolg dat de leerders deze moesten reconstrueren op basis van hun eigen grammaticale kennis. Dit leidde vaak tot veranderingen in de zin, zoals een andere volgorde van het werkwoord en het woord van ontkenning. Als leerders werkwoorden vaker van een bepaalde positie naar een andere positie veranderen dan andersom, kan worden geconcludeerd dat ze een voorkeur voor laatstgenoemde positie hebben. De resultaten van deze taak lieten zien dat beginnende leerders van het Duits over het algemeen geen voorkeur hadden voor een finiete boven een niet finiete positie van het werkwoord. Het maakte daarbij geen verschil of het gepresenteerde werkwoord morfologisch finiet was of niet. Wat wel een verschil maakte, was om welk soort werkwoord het ging. De leerders hadden geen voorkeur voor een bepaalde positie van lexicale werkwoorden zoals 'lopen' en 'eten'. Bij semantisch lege werkwoorden, zoals het hulpwerkwoord 'hebben' ('haben' in het Duits), hadden ze echter wel een voorkeur voor de finiete positie. Meer gevorderde leerders van het Duits hadden voor alle soorten werkwoorden een voorkeur voor de positie die in de doeltaal grammaticaal is. Deze bevindingen bevestigen het vermoeden dat grammaticale kennis over finietheid langzaam wordt opgebouwd (Dimroth et al., 2003, Vainikka and Young-Scholten, 1996a, b). Ook lieten de meer gevorderde leerders van het Duits en de leerders van het Frans zien dat ze kennis hadden van het feit dat alleen finiete werkwoorden in een finiete positie mogen staan: als ze zinnen moesten herhalen waarin een niet finiet werkwoord op de tweede positie stond, veranderden ze dit werkwoord vaak in een finiete vorm. Het feit dat dergelijke veranderingen in het Duits alleen bij de meer gevorderde leerders gevonden werden maar bij alle leerders van het Frans suggereert dat leerders van het Frans de kennis over de formele eigenschappen van finietheid sneller verwerven dan leerders van het Duits. Deze indruk wordt bevestigd in de productiedata die in de hoofdstukken 2 en 3 worden gepresenteerd. Leerders van het Frans gebruiken meer morfologisch finiete vormen en zetten het werkwoord vaker op een finiete positie in de zin dan leerders van het Duits.

Het gebruiken van een finiete vorm hoeft echter niet samen te gaan met begrip van de functie van die vorm. In het tweede deel van het proefschrift, de hoofdstukken 4 en 5, wordt onderzocht wat leerders weten over de functie van finietheid in de zin. Deze hoofdstukken berusten op de beschrijving die Klein (1998, 2006) van de functie van finietheid geeft, namelijk dat finietheid uitdrukt dat de door een zin beschreven inhoud voor een bepaalde situatie geldig is. Of preciezer geformuleerd: de zin "Jan doet de afwas" bevat

een formele markering van het feit dat Jan op een bepaald tijdstip inderdaad de afwas doet. Een niet finiete zin als "Jan de afwas doen" bevat geen formele markering van een dergelijk feit, maar drukt alleen de gedachte uit van een afwas die door Jan zou kunnen worden gedaan. In bepaalde contexten kan een dergelijke zin daarom worden gebruikt om uit te drukken dat de spreker er twijfels over heeft of Jan wel of niet de afwas doet: "Denk je dat Jan de afwas doet?" "Jan de afwas doen". In de experimenten die beschreven worden in hoofdstuk 4 en 5 werden dit soort zinsparen aangeboden aan leerders en moedertaalsprekers. De proefpersonen moesten aangeven of diegene die de tweede zin van de zinsparen uitte, twijfelde aan het daadwerkelijke gebeuren van de door de zin beschreven inhoud of niet. Dit gebeurde door de proefpersonen te laten kiezen uit een drietal plaatjes waarop de gebeurtenis daadwerkelijk plaatsvond, niet plaatsvond, of reeds had plaatsgevonden (een zgn. afleider). De resultaten voor de moedertaalsprekers lieten zien dat de niet finiete zin in deze context inderdaad als twijfel kon worden geïnterpreteerd. Voor de leerders van het Duits werden opnieuw verschillen gevonden die konden worden toegeschreven aan het niveau van taalvaardigheid: gevorderde leerders begrepen het verschil tussen finiete en niet finiete zinnen wel, maar voor minder ver gevorderde sprekers drukte de niet finiete zin net zo goed als de finiete zin uit dat de inhoud van de zin wel degelijk gold voor een bepaalde situatie. Dit laat zien dat ook de functionele kennis over finietheid, net als de in hoofdstuk 3 onderzochte formele kennis, geleidelijk wordt opgebouwd tijdens het taalverwervingsproces. In hoofdstuk 5 wordt bekeken of leerders van het Frans deze functionele kennis op een vergelijkbare manier verwerven. De resultaten in dit hoofdstuk laten zien dat de leerders van het Frans geen verschil maken tussen de interpretatie van finiete en niet finiete zinnen. Deze leerders lijken dus over minder kennis van de doeltaal te beschikken dan de meer gevorderde leerders van het Duits.

Het is interessant deze bevinding te vergelijken met de bevindingen in hoofdstukken 2 en 3. In deze hoofdstukken werd aangetoond dat de leerders van het Frans meer gevorderd zijn wat betreft hun morfosyntactische kennis. Uit hoofdstukken 4 en 5 blijkt dat ze minder gevorderd zijn waar het gaat om hun kennis van de functie van finietheid. In hoofdstuk 5 worden mogelijke redenen voor dit verschil besproken. Mogelijkerwijs dragen de consequentere woordvolgorde in Franse zinnen en de eenvoudigere werkwoordmorfologie van het (gesproken) Frans ertoe bij dat de formele eigenschappen van finietheid gemakkelijker te verwerven zijn dan in het Duits. Echter, het lijkt erop dat die snellere verwerving van formele eigenschappen het juist moeilijker maakt om in deze taal ook de functie van finietheid te verwerven.

Al met al laten de resultaten van dit proefschrift zien dat kennis over een bepaald fenomeen veel verschillende dimensies kan hebben. Het kan zijn dat leerders wel kennis over een grammaticaal verschijnsel bezitten, maar dat ze deze kennis in de verwerking van zinnen in de doetaal (nog) niet toepassen, zoals blijkt uit hoofdstuk 2. Verder blijkt dat

formele en functionele kennis over een verschijnsel niet noodzakelijkerwijs tegelijkertijd worden verworven, zoals blijkt uit de resultaten voor de Franse leerders. Ten slotte laten de resultaen zien dat hetzelfde verschijnsel op verschillende manieren wordt verworven in verschillende doeltalen. Deze resultaten tonen aan dat het belangrijk is om in toekomstig onderzoek verschillende methoden te combineren en gegevens van leerders van verschillende doeltalen te vergelijken.

Curriculum Vitae

Sarah Schimke was born in 1978 in Münster, Germany. After graduation from Gymnasium Borghorst in 1997, she spent one year doing voluntary social work in Strasbourg, France. She then pursued university studies in Münster and Freiburg (Germany) and Grenoble and Strasbourg (France). She graduated from the Albert-Ludwigs Universität in Freiburg in Romance Philology (major), Computational Linguistics and Psychology (minors) in 2004 and in Psychology (major) in 2005. She then was awarded a scholarship from the Max-Planck-Gesellschaft to prepare her Ph.D. thesis at the Max Planck Institute for Psycholinguistics in Nijmegen, Netherlands. During that time, she received a travel grant from the Deutsche Akademische Austausch Dienst which allowed her to spend three months at the University of Paris 8.

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ERRATUM

Page 131: Figure 3 should read:

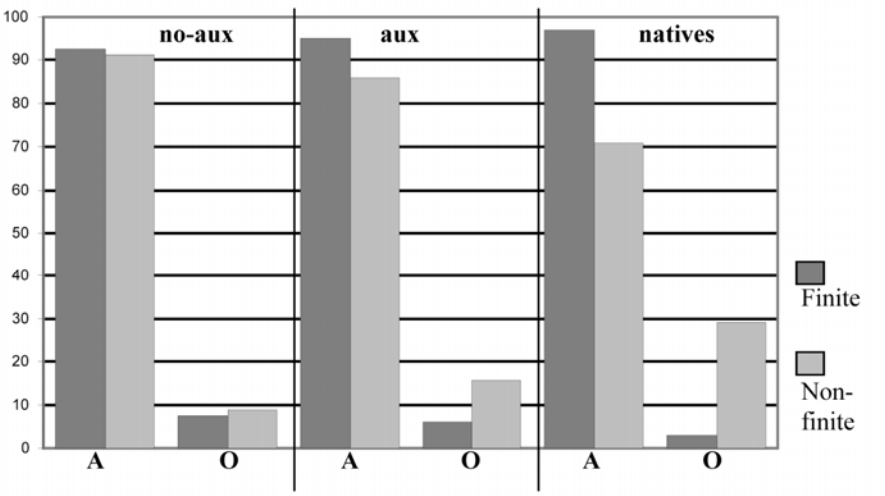

Figure 3: Choices of the assertion picture (A) and the open picture (O) in percentage of all trials in which one of these two was chosen.