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The acquisition of word order in *yes/no* and *wh*-questions

– A case study of an unbalanced bilingual.

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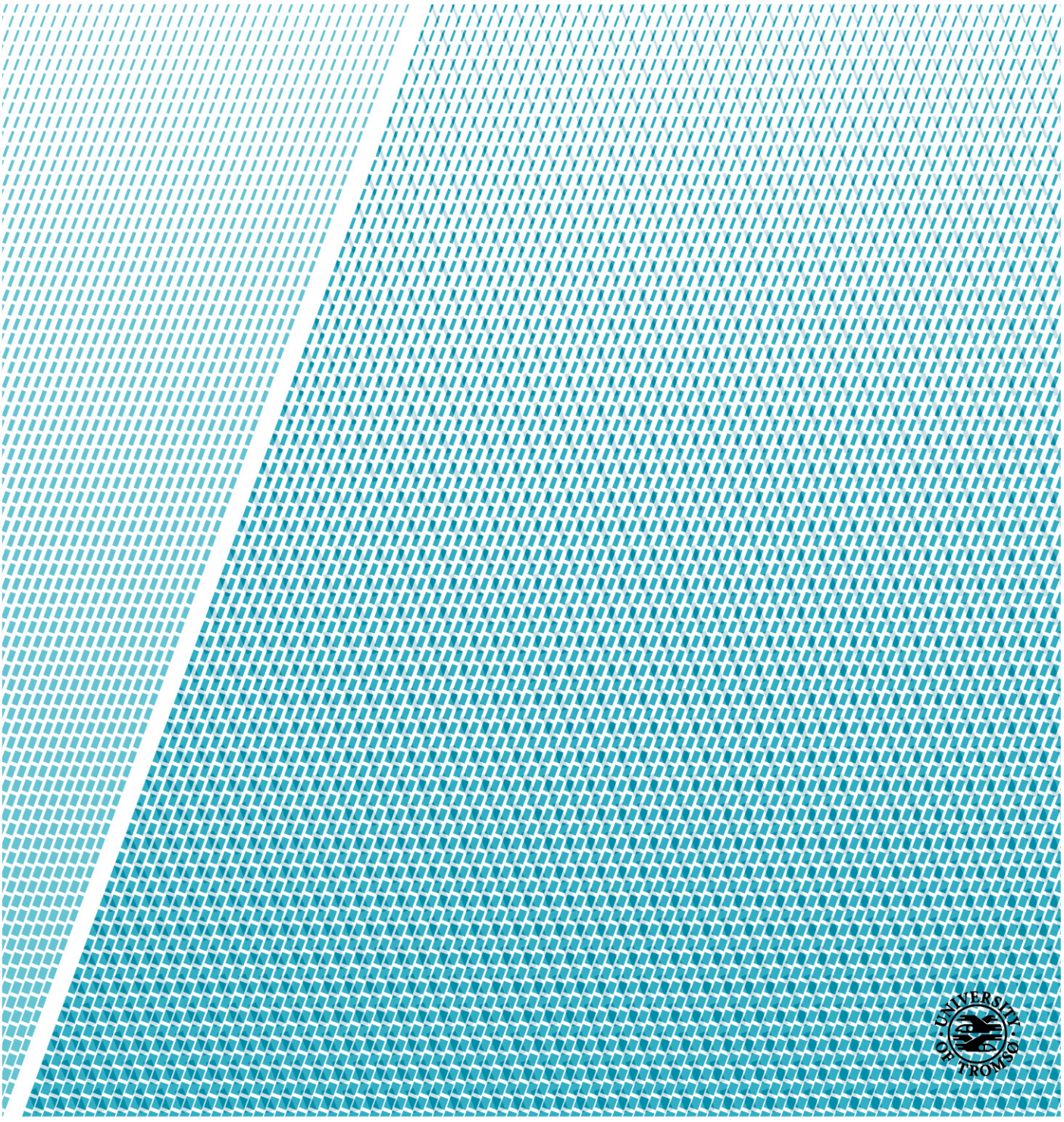

Abstract

This thesis aims to explore the variation with which one bilingual child produces word order in English questions, and ask whether the child's dominant language, Norwegian, affects this production. Using new data from a corpus where data collection is still ongoing, we present evidence that the child transfers the word order for questions in both standard Norwegian and the Tromsø dialect into her English, in both a facilitative and a non-facilitative way. The word order for questions in standard Norwegian and English is identical, verb in second position (V2), with the exception of questions where neither an auxiliary nor the copula BE is present in the initial structure. The word order for questions in the Tromsø dialect exhibits some optionality in certain *wh*-questions, in that *wh*-questions with a monosyllabic *wh*-element may be produced with the verb in third position (non-V2), depending on information structure. We conclude that the child's production of word order in English *yes/no* and *wh*-questions is affected by her dominant language, but that the extent of said effect is uncertain due to limited data.

Keywords: Bilingual First Language Acquisition (BFLA), word order, *wh*- and *yes/no* questions, minimalist theory, Cross-Linguistic Influence (CLI).

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1 Introduction

1.1 A case study of bilingual first language acquisition of Norwegian and English

This thesis aims to explore the acquisition of word order in *yes/no* and *wh*-questions, for one child acquiring Norwegian and English simultaneously, see (1) and (2) for examples of *yes/no* and *wh*-questions respectively. We ask – what is the nature of the child's production of *yes/no* and *wh*-questions in English in terms of word order, and is her production of English questions affected by her dominant language Norwegian? Based on data from naturalistic recordings of the child, we will try to answer these questions and discuss them in light of some previous research and theory concerning language acquisition. The recordings come from a corpus where data collection is still ongoing. The corpus has been supported by a grant from the Research Council of Norway for the project MiMS[1] (Micro-variation in Multilingual Acquisition & Attrition Situations). The child under investigation, Hedda, shows clear dominance in Norwegian as a result of much more input in said language, and we hope that an investigation of her production of questions in terms of word order can be a small contribution to the research on bilingual first language acquisition (BFLA).

(1) Can you find Willy? (Hedda, 4;2.15)

(2) What are you building? (Hedda, 3;5.25)

We will present some previous research pertaining to the acquisition of word order in questions, as well as one account of another Norwegian/English bilingual child, and one account of a monolingual English child. This we will do in order to see whether Hedda produces utterances which are typical of bilinguals with her language combination, or if the same types of utterances are evident in the speech of monolingual English children too. Relevant theory concerning both first, second, as well as bilingual language acquisition, will be presented. We will also present theory concerning language transfer, code-mixing, language modes, and input.

We aim to explore the variation with which Hedda produces both *yes/no* and *wh*-questions in English. In order to do so, we have focused on mainly two types of structures: questions where

[1] Project number 250857

an auxiliary or the copula BE is present in the structure, and questions where neither of these are present initially. The former of these two is syntactically identical in Norwegian and English, while the latter requires the insertion of a dummy-auxiliary in English, but not in Norwegian. This is because of the restrictions on verb movement in English compared to Norwegian, which states that only an auxiliary or the copula can move across the subject and into second position in English, whereas in Norwegian any lexical verb may do so. By studying Hedda's production of *wh-* and *yes/no* questions we might be able to learn something about which structures may present trouble for Norwegian/English bilingual children.

The results of the investigation tell us that Hedda primarily produces English questions with both an auxiliary or the copula in a target-consistent manner, but that she seems to struggle with structures that do not contain Aux/BE and thus requires the insertion of a dummy-auxiliary. We suggest that this might be the result of a misinterpretation of the micro-cues for V2 in English questions, in the way that Hedda fails to note that an auxiliary or the copula is required in second position in English questions, even if neither is present in the initial structure. Furthermore, we find indications that Hedda might try to avoid structures requiring *do*-support because of numerous attestations of utterances that might be considered intonation questions. This type of question is produced by both bilinguals and monolinguals, by children and adults alike, which makes it hard to argue that these utterances are non-target-like. See (3), for an example.

(3) *You have (…) a foot like this? (Hedda, 4;1.11)
'Do you have a foot like this?'

Lastly, we find evidence that Hedda might transfer both the Norwegian and the Tromsø dialect's word order for questions into her English in both a facilitative and a non-facilitative way. As mentioned earlier in this section, the former of these two is syntactically identical in Norwegian and English with the exception of structures where neither an auxiliary nor the copula is present in the initial structure. The latter contains some optionality in word order for *wh*-questions. This optionality will be further explained in section 2.5. We conclude that Hedda's dominant language does affect her production of word order in English questions, but that the extent of this effect is hard to determine due to limited data. In the next section, we present the structure of the thesis.

1.2 Structure of the thesis

Chapter 2 contains a discussion of theory on language acquisition, cross-linguistic influence/transfer, code-mixing, input, and language modes. An overview of the differences in word order in the two languages is also presented.

In chapter 3, some relevant previous research is presented, and at the end of the chapter, we present five predictions based on the theory and previous research.

In chapter 4 the methodology of the study is presented. The methods used in the data collection, audio recording, transcription, and analysis will be covered, as well as some potential methodological issues.

Chapter 5 provides the results of the study. The kinds of utterances Hedda makes are presented along with authentic examples from the data. The results are then analysed and discussed further in chapter 6 in light of the predictions, as well as, the theory and previous research presented in chapters 2 and 3. The thesis is finally summarised and concluded in chapter 7.

2 Background and previous research

2.1 Introduction

In this chapter, we will present relevant theory concerning both first, second, and bilingual language acquisition. We will further present theory on transfer/cross-linguistic influence, as well as three essential factors of bilingual first language acquisition: input, language modes, and code-mixing/switching. An overview of word order in both Norwegian and English *yes/no* and *wh*-questions will be provided too.

2.2 First language acquisition

The impact of the first language on the second language has been much researched, see Foley & Flynn (2013) for a thorough overview. Much of this literature should also be useful in explaining the impact a dominant language has on the weaker language in an unbalanced bilingual situation, as is the case for this thesis. However, bilingual first language acquisition (BFLA) can arguably be seen as more akin to first language acquisition than to second language acquisition, thus a closer look at how first language acquisition works seems relevant to explore.

2.2.2 Approaches to language acquisition

There are two major approaches to understanding how language acquisition happens: the generativist approach and the constructivist approach. A generativist approach to language acquisition, see e.g. Pinker (2015), Chomsky (1956), proposes that children are born with an innate capacity for acquiring language. Pinker (2015) argues that language is an instinct for humans in the same way that incubating an egg is for a mother hen and further points to two crucial facts about language from a generativist point of view. One, every sentence a person utters is quite likely unique and has probably never been uttered in exactly the same fashion before. Thus, the generativists argue that "language cannot be a repertoire of responses" (Pinker, 2015, p. 20). Two, children develop complex grammars very early and go on to produce structures with complex syntax, all without formal instruction. All grammars must then be based on the same rules, a Universal Grammar (UG), which makes children capable of acquiring the linguistic rules of any given language. Once acquired, these rules will allow the speaker to generate (hence generative) new words or sentences in a target-consistent manner. However, there are hundreds of linguistic rules for children to acquire, making children's ability to acquire them all in such a small period of time seem rather incredible. A generativist would thus argue that because children are born with innate access to UG, all they have to acquire is

the specific rules pertaining to their language. These specific rules are what makes one language different from another and are often referred to as **parameters**. Once acquired, a parameter will allow the child to make generalizations for his language, and thus the child does not need to acquire hundreds of linguistic rules, only a few language-specific parameters (Pinker, 2015). Furthermore, in initial stages of acquisition, a generativist approach to language acquisition assumes that children will overgeneralize certain parameters because of lacking support in the input to suggest that the child has set a given parameter too wide.

The other major approach to language acquisition is the constructionist approach, or usage-based approach, which assumes that linguistic input is the most crucial part of language acquisition. As opposed to a generativist view of language acquisition, the usage-based approach, see e.g. Tomasello (2015), assumes that children are not born with an innate capacity for acquiring language, but rather two sets of cognitive skills that are both evolved for more general functions than linguistic communication. These two skills are **intention reading** and **pattern-finding**. Intention reading is something children must do in order to understand the goals or intentions of adult speakers when they use language. Pattern-finding is what children must do in order to acquire the many ways in which one might use a single word or phrase, and thus be able to produce new combinations of these (Tomasello, 2015).

Furthermore, a usage-based view of language acquisition assumes that children are able to create simple structures in their given language in a target-consistent manner by using the two skills mentioned above, but that they virtually never produce complex structures that are unattested in the language they hear, i.e. in the input (Tomasello, 2015). It is further assumed that children make generalizations for their language based on an understanding of syntactic function. De Ruiter & Theakston (2017) explain this as: "linguistic knowledge is represented in the form of constructions, which can be thought of as form-function pairings, and rather than using rules to produce new utterances, children are assumed to operate by analogy (e.g. 'kiss – kissed, miss – missed')" (p. 59). A usage-based approach to language acquisition too assumes that children will make overgeneralization in initial stages of acquisition because of certain words or structures being infrequent in the input. However, as opposed to a generativist approach, a usage-based approach does not assume that children set parameters and that non-target-like utterances are the result of these parameters being set to widely. Instead, because they assume that language structures emerge from use and not from an innate ability to acquire them, they assume that children will overgeneralize the structures they have been frequently exposed to into structures they have been less frequently exposed to. We use the term less

frequently because Tomasello (2015) points to the fact that children virtually never try to produce structures they have not been exposed to earlier.

Traditionally, the latter of these two approaches ask questions like what kind of information is available to the language learner through the input? How does a child progress from simple one-word utterances to full sentences with complex syntax? To that end, the language children hear, the input, has been thoroughly investigated by constructivist researchers, often through the study of corpora of child-directed speech (CDS) collected in everyday-life conversations (de Ruiter & Theakston, 2017). Today, such questions are asked by both generativists and constructivists alike, and the study of corpora is still used by both as a means of researching these questions. Furthermore, while generativists and constructivists have disagreed fundamentally in the past, they have moved closer to each other in recent years, and the question is often how much of language acquisition is innate and how much is acquired from input.

A more recent approach to language acquisition that would be placed somewhere between a traditional generativist approach and a traditional usage-based approach is described and advocated in Westergaard (2009a). She presents a cue-based approach to language acquisition based on Lightfoot (1999). Lightfoot's (1999) cue-based model defines a cue as a piece of structure, provided by UG, which means that a cue is not a piece of structure provided in the input, but rather a syntactic structure within a child's linguistic system as a result of analysis of the input. Westergaard (2009a), however, claims that children must be sensitive to a set of smaller-scale cues, which she calls micro-cues. The micro-cues are not themselves provided by UG, and "[i]nstead, children are assumed to be endowed with categories and structure, and thus the ability to detect fine linguistic distinctions in the input" (Westergaard, 2009a, p. 1031). She bases this claim on the large variation in word order found in Germanic languages, and points specifically to the fact that Norwegian does not exhibit V2[2] in all structures, which we will elaborate more on in section 2.5.

As this thesis's main interest is word order in questions, a look at how the cues for acquiring this needs to be elaborated on. Westergaard (2009a) has formulated cues for the acquisition of V2 in *wh*-questions in both English and the Tromsø dialect of Norwegian as seen in (4a-b) and (6a-b). She considers questions to be Int(errogative)Ps, and thus the cues are formulated as

[2] V2 – Verb in second position.

such. In order to explain what the cues state, we will break down (4b) and state what each element represents. Quite simply, it states that a *wh*-question is an Interrogative Phrase (IntP) which is made up of a *wh*-element in first position, and an interrogative (Int°) inflectional element (I) in second position. Given that auxiliaries and BE are the verb types that show tense and agreement in English, the cue calls for one of these to appear in second position. The rest, as indicated by (…), should follow the SVO word order of English. In (4a), the cue does not call for an inflectional element in second position, but simply states that any lexical verb (V) may be placed here. Furthermore, the (Int°) indicates that the element following it must be interrogative and must appear in the noted position. Examples of both English and Norwegian *wh*-questions can be seen in (5a-b)

(4) a. Cue for V2 in *wh*-questions (Standard Norwegian):

$_{IntP}$[wh $_{Int°}$V_]

b. Cue for V2 in *wh*-questions (English):

$_{IntP}$[*wh* $_{Int}$°I...]

(5) a. Norwegian *wh*-question:
Hva tenker du på?
What think-PRES you-on
'What are you thinking about?'

b. English *wh*-question:
Who are you talking to?

As mentioned earlier in this section, the Tromsø dialect does not exhibit V2 in all structures; The Tromsø dialect allows non-V2 in *wh*-questions with a monosyllabic *wh*-element if the subject is informationally given, see e.g. Westergaard (2003b; 2009a). This variation needs to be accounted for in the cue, and consequently, one cue must be formulated for each variation exhibited in the language (6a-b). The cue for V2 in *wh*-questions with a monosyllabic *wh*-element in Norwegian (6b) contains a few hitherto unexplained elements. Westergaard (2009a) notes that this particular cue "contains a wh-head which may appear in second position itself" and that "the V2 word order that sometimes occurs in these cases is then considered to be the result of a lower functional head, called the TopP" (p. 1030). The TopP is considered to be sensitive to information structures and is further argued to attract the verb when the subject is

focused or new information ([+FOC]). Given that the cue formulated in (6b) illustrates the exception to the non-V2 word order in *wh*-questions with a monosyllabic *wh*-element, we need not formulate one for non-V2 word order. While the cues in (4) and (6) have all been formulated by Westergaard (2009a), we have formulated the ones in (7) ourselves, albeit with inspiration from Westergaard. Examples of both *wh*-questions with short and long *wh*-elements in Norwegian, as well as, *yes/no* question in both Norwegian and English are provided in (8a-d).

(6) a. Cue for V2 in *wh*-questions with long *wh*-elements (Norwegian):

$_{\text{IntP}}[\text{XP}_{[+\text{wh}]}\ _{\text{Int}}{}^{\circ}\text{V}\ldots]$

b. Cue for V2 in *wh*-questions with monosyllabic *wh*-elements (Norwegian):

$_{\text{IntP}}[_{\text{Int}}{}^{\circ}\ \text{wh}\ _{\text{TopP}}[_{\text{Top}}{}^{\circ}\text{V}\ \text{SU}_{[+\text{FOC}]}]\ldots]$

(7) a. Cue for V2 in *yes/no* questions (English):

$_{\text{IntP}}[^{\text{Int}^{\circ}}\ \text{I SU V}\ldots]$

b. Cue for V2 in *yes/no* questions (Norwegian):

$_{\text{IntP}}[^{\text{Int}^{\circ}}\ \text{V SU}\ldots]$

(8) a. *Wh*-question with short *wh*-element (Norwegian – Tromsø dialect):

Kor den er?

Where it-is

'Where is it?'

b. *Wh*-question with long *wh*-element (Norwegian – Tromsø dialect):

Kordan farge er det på bilen?

What colour is it-on the car

'What kind of color is the car?'

c. *Yes/no* question (Norwegian):

Har du en sykkel?

Have-you a bicycle

'Do you have a bicycle?'

d. *Yes/no* question (English):

Are you laughing?

After having spent considerable time detailing different approaches to language acquisition, we now move on to the acquisition of a second language (L2).

2.3 Second language acquisition

As mentioned above, the effect of the L1 on the L2 has been thoroughly researched, and a brief outline of the differences between L1 acquisition and L2 acquisition seems relevant. First of all, even if generativists assume that some parts of language are innate and thus, does not need to be acquired, language is something humans do not have complete innate knowledge of, i.e. some parts of language need to be acquired. Moreover, as humans are capable of acquiring multiple languages no matter the L1, the syntactic operations of every language must be, more or less, the same. Language variation is thus assumed to be "relegated to the functional lexicon […] Consequently, a child acquiring her native language does not need to learn syntactic operations, but she does have to learn the grammatical features pertinent to her language that are captured in the functional morphology" (Slabakova, 2016, p. 17). Most people will agree that L2 acquisition is quite different from L1 acquisition, but Slabakova notes that:

> A second language learner has access to the universal properties of language through Universal Grammar, or through his/her native language, which exemplifies these universal properties. There are several things to acquire. First of all comes the lexicon: all the words of the second language are likely to be new to the learner. Then, all the parametric options that are different between the L1 (native language) and the L2 (second language), such as word order, null subject, etc., have to be acquired, as well (Slabakova, 2016, p. 17).

The quote tells us that an L2 learner needs to acquire the words of the second language (lexicon), as well as the differences between the L1 and the L2. Given that the language learner needs to acquire both the lexicon, syntactic and grammatical features of his/her language when acquiring the L1 as well, one might argue that L2 acquisition is not quite so different from L1 acquisition after all.

In the late 1960s, Lenneberg (1967) was one of the first to argue that there is a critical period for language acquisition. The critical period hypothesis suggests that there is a window of time for acquiring language and that if language is not acquired before this window closes, full native-like proficiency will be impossible to attain. While the critical period for language may or may not apply to L2 acquisition, at least not in the same sense as for L1 acquisition,

Slabakova (2016) points to one significant difference between the two, which is that an L2 learner already has functional knowledge of one language, the L1. Consequently, what the learner needs to acquire is the lexicon of the L2 as well as the syntactic and grammatical features pertaining to the target language. As it turns out, this is not as simple a task as one might assume. Slabakova (2016) argues that native-like proficiency in an L2 is possible but very hard to acquire.

2.3.1 Cross-linguistic influence

Cross-linguistic influence (CLI) (Sharwood Smith, 1983), or **transfer** (Weinreich, 1953), are both common names for the effect two or more languages/grammars may have on each other. From the emergence of the term transfer in the 1950s, its meaning has traditionally been taken to be the effect an L1 has on an L2, see e.g. Cook (2016), Moattarian (2013). In later years, however, Cook (2016) among others, has criticized this way of thinking about transfer because of the definition of the word in the dictionary - "to convey from one person, place, or situation to another" (Merriam-Webster, 2019), which suggests a one-way directionality. CLI, as opposed to transfer, in Sharwood Smith's (1983) own words "allows for the influence of second or other languages as well as for the influence of non-native languages on the learner's own L1" (p. 193). Weinreich (1953) first referred to "those instances of deviation from the norms of either language which occur in the speech of bilinguals as a result of their familiarity with more than one language" (p. 1) as **interference**. And although more recent studies might be interested in the effects of multilingualism, Cook (2016) points out that until recently, fairly few had taken these effects into consideration in their research. Nevertheless, there now exists much research concerning the effects an L2 can have on an L1, see e.g. Hirata-Edds (2011) for an account of how L2 heritage Cherokee can affect L1 English.

2.3.1.1 Economy and CLI

Within minimalist theory (Chomsky, 1995), it is considered more costly to move a syntactic element than not to move it. Bentzen (2004) however, argues that in an acquisition perspective, a child might opt for an arguably more costly option which involves movement if this leads to greater consistency in the grammar. Platzack (1996) claims that children will opt for the least marked grammar – markedness is defined as "the mechanisms forcing overt operations in a language" (p. 369). It is further argued that covert syntactic operations are less costly than overt ones, i.e.children are assumed to opt for the least costly syntactic operations when acquiring a language, e.g. V2 word order will be deemed more marked, and thus more costly than SVO

word order because it requires verb movement to second position. Furthermore, if children initially opt for the least marked grammar, they must assume that all features are weak, and thus avoid movement. Platzack (1996) calls this the Initial Hypothesis of Syntax (IHS). From this perspective, acquisition is viewed as adjustments of the IHS to better correlate with the target language based on positive evidence in the input.

If children are assumed to favour the least costly option in initial stages of acquisition, a bilingual child should be assumed to transfer the less costly option into the other language if the latter language requires a more costly option in order to be target-consistent, and not the other way around. Bentzen (2004) however, finds that for the bilingual child in her study, "structural markedness is not the major motivation behind language transfer" (p. 171). Instead, she finds that the child, Emma, transfers the more marked parameter (+V2) into English (SVO). Emma is a bilingual girl too and will be mentioned several times throughout this thesis in relation to the child under investigation, Hedda. In the sections to follow we will very briefly explore what it means to be bilingual, who can be defined as bilingual, as well as three factors deemed to be important for BFLA.

2.4 Bilingual acquisition

2.4.1 An overview

What is bilingualism? Or rather, who can be defined as a bilingual? Put very simply; a bilingual person is someone who has "the ability to use two languages" (Slabakova, 2016, p. 92). The child, Hedda, on which this thesis is based, has a very uneven distribution of input in her two languages Norwegian and English. The definition of bilingualism used by Slabakova (2016) will thus be very useful for this thesis because it proposes the possibility of an unbalance between the two languages of a bilingual. We will come back to Hedda later on in section 4.2, but for now, let us take a closer look at what it means to be bilingual.

In section 2.3.1, we saw that CLI refers to the effect an L1 might have on an L2 or vice versa. In light of this, it becomes significant that one of the central aspects of being bilingual is that both languages are active at all times, even when the speaker only uses one (Slabakova, 2016; Bialystok, 2009). Weinreich (1953) makes a crucial distinction between CLI in speech production and language knowledge. In other words, a bilingual or an L2 learner might have correct knowledge of the target language's grammar and lexicon, and at the same time produce non-target-consistent speech. Let us now consider the effect of this constant activation of two

different languages. For both input and output, this dual activation will have two competing lexicons to choose from, as well as two competing word orders, e.g. English SVO and Norwegian V2. Or as Slabakova (2016) puts it, "[w]ithin the mental lexicon, accessing a word in one language leads to the activation of related words in the other language, both in comprehension and in production" (p. 93). One would assume that this might be rather troublesome for the bilingual speaker, and in fact, Bialystok (2009) claims that "this situation creates a problem of attentional control that is unique to bilinguals — the need to select a form that meets all the linguistic criteria for form and meaning but is also part of the target language and not the competing system" (p. 3). She further points to this being the feature that distinguishes bilingual speech most from monolingual speech. The constant activation of two languages might also help explain the previously mentioned distinction between CLI affecting speech production and CLI affecting language knowledge, because when one has two lexicons to choose from it is not always easy to choose a word from the target language. However, this does not mean that the bilingual speaker does not know the equivalent word in the target language. According to Slabakova, this dual activation never ceases to happen, not even in adult bilinguals who are fluent in both languages. More importantly for this thesis, the dual activation happens regularly in "initial stages of acquisition" (Slabakova, 2016, p. 93). With this in mind, we must assume that this is the case for Hedda, as well.

2.4.2 Input

It has been well established in SLA research that children's language-learning environment, i.e. the input, plays a significant role in all types of language acquisition. For children acquiring two languages from birth, two questions arise, one, how much input does the child receive in each language, and two, what are the circumstances in which this input is received? Such questions are highly relevant to this thesis, as it will be important to know something about how, when, and where Hedda receives her language input, in order to say something about and discuss her language output. The question is, how does one assess the amount of input a bilingual child receives in each language?

According to Grüter et al. (2014), relative measures of input have often been used to determine the amount of input in each language. This is done by estimating the percentage amount of input in each of the given languages, e.g. 75% input in Norwegian and 25% input in English (a monolingual Norwegian child would receive 100% input in Norwegian). However, Grüter et al. (2014) note that relative measures of input are an inadequate way of explaining child

absolute output. They found that absolute measures of input, i.e. the total amount of unique words the child receives in the input of each language, correlated much better with the child's total output, i.e. the total amount of unique words the child produces. As an example, we can say that a bilingual child hears 4000 words in English and 8000 words in Norwegian each day, and the child's productive vocabulary in the two languages contain 200 words and 400 words respectively.

When researching why children growing up in bilingual environments fail to use both languages productively, De Houwer (2007) found that the home-language situation played an important role. She reports that families where both parents only spoke the minority language at home, or families where one parent spoke only the minority language and the other spoke both the minority and majority language had the highest success rates in terms of children speaking both languages. 96,92% of families where both parents spoke only the minority language had at least one child that productively used both languages. For families where one parent spoke only the majority language, and the other spoke only the minority language (often referred to as the one parent, one language model, 1P/1L), the corresponding percentage was 74,24% (De Houwer, 2007).

2.4.3 Language modes

As mentioned in the previous section, it is important to know where, and in which circumstances the bilingual child receives his/her language input. Grosjean (2008) provides us with some helpful terms regarding the circumstances in which a bilingual receives input. He writes about language modes. A "[l]anguage mode is the state of activation of the bilingual's languages and language processing mechanisms at any given point in time" (Grosjean, 2008, p. 39), i.e. in a monolingual mode, one of the bilingual's two languages would be much less activated than the other. However, as we saw in section 2.4.1, both languages are always active, even if one of them is less active. Grosjean (2008) describes the changes in language mode for a bilingual as a continuum, with a fully monolingual mode at one end and a fully bilingual mode at the other. An example of this would be a Finnish/Swedish bilingual who at home speaks only Finnish, and thus finds himself in a monolingual Finnish language mode, while at work uses both Finnish and Swedish in a bilingual language mode.

However, many bilinguals are not equally fluent in both languages, resulting in language dominance in one of the languages, and as we shall see in later chapters, this is the case for Hedda as well. A possible result of one of the bilingual's languages being more dominant than

the other, is the bilingual subject's inability to enter a fully monolingual language mode in the weaker language, even when speaking with a monolingual in the target language (Grosjean, 2008).

2.4.4 Code-mixing and code-switching

For many bilinguals, code-mixing and code-switching is a natural part of their speech production, especially in a bilingual language mode. The term 'code' is here used to refer to any language, dialect, or variety thereof. The term code-switching most commonly refers to when a speaker switches between codes in speech, often depending on circumstance. The term is sometimes distinguished from code-mixing, and sometimes not (Matthews, 2014). Yow et al. (2016) note that some researchers make a distinction between the two where code-switching "refers to the juxtaposition of two codes (languages or dialects) in a discourse that are grammatical and constrained by regularities" (p. 81), and code-mixing refers to mixing two or more languages within a single word or utterance and thus making the utterance ungrammatical. This distinction will be used in this thesis as well. Examples of code-switching and code-mixing are provided in (9) and (10). In (9) we see Hedda making an utterance in Norwegian, and then altering her response to English in her next utterance to make sure the investigator understands, as the investigator speaks English. In (10) we have provided an example of Hedda mixing a non-target word 'bird' into her otherwise Norwegian utterance.

(9) Code-switching: (Hedda, 3;6.22)

*CHI: *Dem spis mus* – **They eat mouse-PLUR** – 'They eat mice'

*INV: What do they eat?

*CHI: Mouse

(10) Code-mixing: (Hedda, 3;2.2)

*CHI: *Æ høre en* bird – **I hear-PRES a bird** – 'I can hear a bird'

In the field of BFLA, there has been considerable debate about what code-switching and code-mixing is, why bilinguals do it, and when they do it. According to Yow et al. (2016), there is evidence that bilingual children under the age of 3;6 use both code-switching and code-mixing as a strategy to communicate their needs and wishes when their lexicon is lacking the right words in the target language. Furthermore, according to De Houwer (2009), there is also evidence that code-switching is a sign of high competence in both languages, provided that the bilingual speaker adheres to the grammars of both languages, and that there is evidence of a

correlation between code-switching and code-mixing in child output and parental input. However, as we shall see later, this is not the case for Hedda.

2.5 Word order in *yes/no* and *wh*-questions

Considering that the objective of this thesis is to uncover how the child, Hedda, deals with word order in *yes/no* and *wh*-questions, an overview of the differences between Norwegian and English seems pertinent. While the general word order of English is Subject-Verb-Object (SVO), as illustrated in (11), the word order for *yes/no* and *wh*-questions is typically referred to as residual V2. This means that a *yes/no* or *wh*-question in English requires subject-auxiliary inversion (SAI), which is illustrated in (12) and (13). The reason for this exception in English word order is, according to Westergaard (2009a), that Middle and Old English had V2 word order, and that some residue of this is manifested in English *yes/no* and *wh*-questions, hence residual V2. Furthermore, considering that SAI is a syntactic requirement, but not all *yes/no* and *wh*-questions have an auxiliary verb in them, the insertion of a dummy-auxiliary (*do*) is required (Westergaard, 2009a) as illustrated in (14). The insertion of a dummy-auxiliary, whose only apparent function is to check tense and agreement, is considered a rather complex operation and is usually acquired at a later stage for virtually everyone acquiring English, including monolingual English children (Bentzen, 2004).

(11) John plays chess.

(12) When are we leaving?

(13) Is John playing chess?

(14) When did they leave?/*When left they?

Norwegian, as opposed to English, is assumed to have verb movement to second position in all types of main clauses (Westergaard, 2003a). This means that Norwegian requires V2 word order, not only in questions but in all topicalized structures. Further, while verb movement is restricted to only auxiliaries and the copula BE in English, all lexical verbs may appear in front of the subject in Norwegian. Examples of this can be seen in (15) and (16).

(15) *I går studerte Thomas i åtte timer.*

Yesterday study-SIMPLE-PAST Thomas for eight hours.

'Yesterday Thomas studied for eight hours.'

(16) *Hva spiller du?*

What play-PROG you?

'What are you playing?'

In her article, Westergaard (2003a) concludes that Norwegian L1 learners of English L2 need to unlearn the V2 order of Norwegian to acquire the SVO order of English. English questions, however, do not require SVO word order but V2, making it identical to the Norwegian word order for questions. It thus becomes hard to argue that Norwegian children acquiring L2 English would have much trouble with acquiring the target-like word order for English questions. What we might assume to be a troubling aspect for Norwegian children acquiring L2 English with regards to word order in questions, is that only the copula BE and auxiliaries are allowed to move across the subject in English, whereas any lexical verb can appear before the subject in Norwegian. And while examples of structures where the main verb has been inverted are virtually never attested in monolingual English data according to Déprez & Pierce (1993), inversion of a main verb could be expected in the speech of Norwegian children acquiring English due to the same movement being grammatical in their L1.

(17) *Spilte Helene Playstation i går?*

Play-SIMPLE-PAST Helene Playstation yesterday?

'Did Helene play Playstation yesterday?'

In (17) we can see an example of the abovementioned problem area. In Norwegian the lexical verb *spilte*– 'played', is syntactically required to appear before the subject 'Helene', whilst in English, the same lexical verb appearing in the same position would be ungrammatical. Instead, we need the support of a dummy-auxiliary, which is allowed to move across the subject, to make the sentence grammatical in English (Westergaard, 2003a;2009a).

The case for this thesis, however, is a little more complicated than the paragraph above suggests. As noted in section 2.2.2, some Norwegian dialects do not necessarily adhere to a V2 word order in certain question types, and the Tromsø dialect is an example of this. According

to Westergaard (2003b), the Tromsø dialect allows non-V2 in *wh*-questions with a monosyllabic *wh*-element, e.g. *ka*– 'what', *kem* – 'who'. This is of course of great significance to this thesis, as Hedda is a speaker of the Tromsø dialect. An example of a *wh*-question with non-V2 word order can be seen in (18). However, as noted, the Tromsø dialect only allows non-V2 word order in sentences with short, monosyllabic *wh*-elements, which would make the sentence in (19) ungrammatical if produced with non-V2. Furthermore, according to Westergaard:

> The variation between V2 and non-V2 with the short wh-elements is not random. A study of adult spontaneous speech has shown that there are clear preferences related to the subject and verb types, non-V2 typically appearing when the subject is a personal pronoun, and V2 when the subject is an NP and the verb is BE (Westergaard, 2009a, p. 1025).

(18) *Ka du vil?/ Ka vil du?*

What you want?/What want you?

'What do you want?'

(19) **Korfor du gråter?/ Korfor gråter du?*

Why you cry-PROG?/Why cry-PROG you?

'Why are you crying?'

Knowing this, it seems unlikely that Hedda would make utterances with non-V2 in sentences with long *wh*-phrases in Norwegian, seeing as there will be very little, if any, input on which to base such utterances. However, that does not mean that she would not make the equivalent utterances in English, and simply leave out the auxiliary, e.g. 'why you cry?', 'when we leave?'. However, as we shall see in the next chapter, omitting the auxiliary is not uncommon in monolingual English children either, possibly making it even more likely that Hedda will do the same. It is also noteworthy that some monolingual English children fail to produce questions with the required SAI when the question-word is 'why' to a much larger extent than with other *wh*-words, see e.g. Rowland & Pine (2000). An example of such a child is Adam (Brown, 1973), whom we will come back to in the next chapter. For a child acquiring either Norwegian or English, there seems to be a large amount of detail to be acquired where word order is concerned. For instance, that in English SAI only applies in questions and negations, and that verb movement is restricted to auxiliaries and the copula. Norwegian children growing up in

Tromsø need to learn that SAI is required in some *wh*-questions with short *wh*-elements and not in others (Westergaard, 2009a). With this information in mind, it is easy to assume that Hedda will, at least partially, mix up these rules, and make non-target-consistent utterances in both languages. We will get back to this later in the thesis, where we will also make some predictions based on this information.

2.6 Summary

In this chapter, we have provided an overview of first, second, and bilingual language acquisition, along with a description of both a generativist view and a usage-based view of language acquisition. We have also provided a description of language acquisition through micro-cues, along with a presentation of the cues for word order in both English and Norwegian questions.

A brief introduction to transfer/CLI was provided along with elaborations on economy of transfer. Here we saw that moving a syntactic element is considered more costly than not moving it within minimalist theory (Chomsky, 1995), and further, that in terms of transfer, bilingual children should be assumed to transfer the less costly feature of one language into the other if the latter requires a more costly feature in order to be grammatical. Additionally, we saw that this claim was disputed by Bentzen (2004) when she found that the child in her study did not transfer the less costly word order (SVO) but rather, the more costly one (V2) into her English.

Furthermore, we have seen that the two languages of a bilingual are both more or less active at any given time (Bialystok, 2009; Slabakova, 2016), and that the language mode in which the bilingual finds him/herself in is an essential factor in determining how active the languages are (Grosjean, 2008). Following that, we saw that code-switching might be seen as a sign of high competence in both languages (Grosjean, 2008), while code-mixing is often used as a strategy by bilingual children to communicate their wants and needs when the target language lexicon lacks the needed words (Matthews, 2014; Yow et al., 2016).

Lastly, at the end of this chapter, we provided an overview of the word order for questions in both Norwegian and English, and briefly outlined the differences and some potential problem areas for Hedda. In the next chapter, we present some previous research on the acquisition of word order in questions.

3 Previous research

3.1 Introduction

In this chapter, an overview of the acquisition of V2 word order is given, along with two opposing accounts of the acquisition of word order in *wh*-questions for one monolingual English child. One account of the acquisition of verb movement in one Norwegian/English bilingual child is presented as well. At the end of the chapter, five predictions based on the theory from chapter 2 and the previous research from this chapter, are presented.

3.2 Acquisition of V2 word order

The acquisition of word order has been extensively researched, and so has the acquisition of V2. Poeppel & Wexler (1993) note that German children seem to acquire some very abstract properties of grammar at an early age, e.g. verb movement to C[3]. They further argue that the complex syntactic computations that allow the child to acquire these grammatical properties must be the result of some underlying principles that are part of the linguistic system, i.e. UG.

Westergaard (2009b) notes that the V2 word order of Norwegian too is acquired very early. More importantly, she notes that in the Tromsø dialect, which allows non-V2 in *wh*-questions with a short *wh*-element, both the word order with inversion (V2) and the word order without inversion (non-V2) are acquired more or less simultaneously, and that this is attested very early.

What we can extract from the two paragraphs above, is that for both German and Norwegian children, the acquisition of word order seems to happen at a very early age and that in cases where optionality occurs, said optionality does not slow down acquisition. Westergaard (2009a) reports that the same rapid acquisition seems to be the case for Swedish (Waldmann, 2008), and for Dutch (Blom et al., 2013), as well.

The acquisition of word order in *yes/no* and *wh*-questions in English children has also been much researched. According to Westergaard (2009a), the findings yield somewhat varying results, e.g. Westergaard (2009a) finds that questions with the copula display very low rates of inversion errors (e.g. 'when are you leaving?'), while Rowland & Pine (2000) find that 'what' is the *wh*-word that shows the highest rate of correct use (e.g. 'what am I reading?'). For a more

[3] Complementizer position

extensive overview see Ambridge et al. (2006). Furthermore, Westergaard (2016) notes that clauses with missing auxiliaries, as opposed to the copula, are attested both more often and at later stages of acquisition for both English and Norwegian children. She views this as an indication that there is a clear distinction between the copula and other auxiliaries in terms of acquisition. In the next section, we will provide a brief overview of the findings of both Rowland & Pine (2000) and Westergaard (2009a) concerning one child, Adam, in the Brown Corpus (Brown, 1973).

3.3 Two opposing accounts of the acquisition of word order for one English monolingual child

Rowland & Pine (2000) present a constructivist account of the acquisition of *wh*-questions in English and argue for the importance of input from the caregiver's speech. They further argue that the relative frequency of certain combinations of *wh*-words + auxiliary is the reason for the early acquisition and production of these combinations in the child data. Their paper analyses the data from one child, Adam, in the Brown Corpus (Brown, 1973) and question whether there is evidence in the child data that the child is producing correctly inverted *wh*-questions by using a subject-auxiliary inversion rule (Rowland & Pine, 2000). They conclude that there is not. Instead, they argue that the reason for Adam's ability to produce target-consistent *wh*- + Aux combinations because he has lexically-specific knowledge which he has acquired through frequent attestation in the input. In other words, they argue for rote-based learning and discard any rule-based learning. Examples of a non-target-like utterance and a target-like utterance are provided in (20) and (21) respectively.

(20) *Why he can't hit? (Adam, 3;4.1) (Brown, 1973)

(21) What am I saying? (Adam, 3;4.1) (Brown, 1973)

Westergaard (2003b) presents a study on the acquisition of word order in *wh*-questions in the Tromsø dialect, which as we know, allow non-V2 in certain questions with a monosyllabic *wh*-element. The study is based on three children living in Tromsø, and the recording period covers their age from approximately 1;9 to 3;0. The results of the study show that the three children acquire both word orders (V2 and non-V2) simultaneously. While re-evaluating the child data from Westergaard (2003b) and Rowland & Pine (2000), Westergaard (2009a) finds that where questions are concerned, even if they require different word orders, the three Norwegian children "immediately produce the target-consistent word order in the right contexts" (p. 1038)

in the Tromsø dialect, as seen in (22) and (23). This means that where both a generativist approach and a constructivist approach would predict a certain amount of overgeneralization in the children's production based on some words or structures appearing less frequently in the input, there is very little evidence to suggest that either of these approaches can fully explain the Norwegian children's acquisition of word order in questions.

(22) *Ka du gjør?* (Ann, 2;3.9) (Westergaard, 2003b)
What you do-PRES
'What are you doing?'

(23) *Ka hete han (der)?* (Ina, 2;2.12) (Westergaard, 2003b)
What is-called he (there)
'What is he called?'

Where the English child data is concerned, Rowland & Pine (2000) find that Adam produces a lot more *wh*-questions with either missing auxiliaries or uninverted *wh*-questions than inverted *wh*-questions in the early data. Furthermore, the percentages of *wh*-questions with missing aux, inversion, and non-inversion even out in the later data files. For an overview see figure 1.

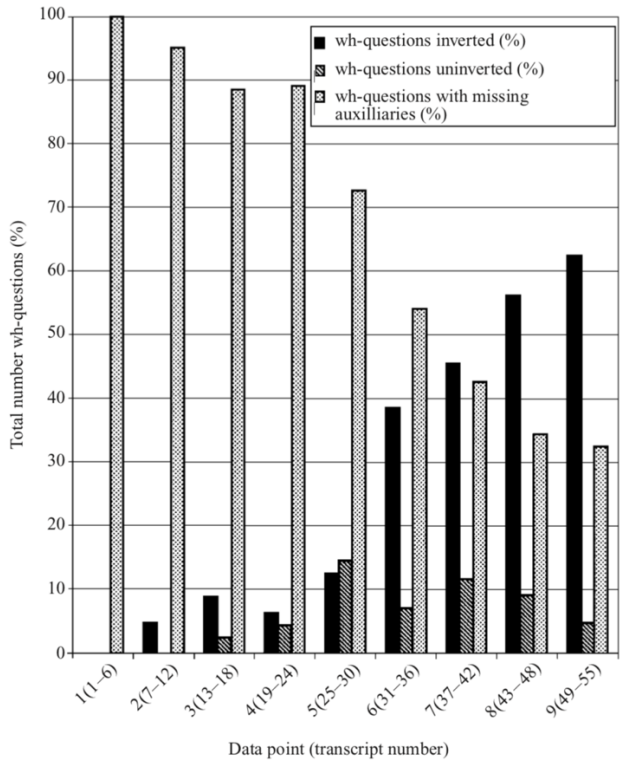

Figure 1 Percentage of WH-questions with inverted, uninverted and missing auxiliaries as a proportion of total number of WH-questions produced in the child's data (Rowland & Pine, 2000, p. 168)

Table 1 The percentage of wh-questions with missing verbs/auxiliaries, non-inverted, and inverted word order in Adam.19–36 (age 2;11.28–3;8.14) (Westergaard, 2009a, p. 1039).

	BE			Aux		
Files	Missing	Non-inv.	Inversion	Missing	Non-inv.	Inversion
19–24	60·6% (152)	2·0% (5)	37·4% (94)	87·6% (254)	2·4% (7)	10% (29)
25–30	30·4% (97)	2·5% (8)	67·1% (214)	77·2% (247)	15% (48)	7·8% (25)
31–36	14·2% (25)	2·3% (4)	83·5% (147)	57·0% (130)	9·2% (21)	33·8% (77)

Westergaard (2009a), while re-evaluating the same data, finds that if one includes the copula BE in the analysis (Rowland & Pine (2000) only looked at *wh*-questions involving auxiliaries), the numbers are quite different, see table 1. She finds that "wh-questions with missing BE are much less frequent than questions with missing auxiliaries" (Westergaard, 2009a, p. 1039) and further notes the virtual non-existence of non-inversion errors with BE. Thus, it seems that Adam has more trouble with auxiliaries than with BE, as 94,1 % of his utterances with BE are target-consistent while only 33,3% of his utterances with auxiliaries are target-consistent.

When looking at questions with long *wh*-phrases in Adam's data, see (24) for an example, Westergaard (2009a) found that Adam produces 43 questions with long *wh*-phrases and that as many as 81,4% (35/43) of these appear with target-consistent inversion. Moreover, these findings are very contradictory to the assumption one must make from the constructivist approach that Rowland & Pine (2000) present, as such an approach would assume that most of these utterances would be produced without the required inversion due to the relatively low frequency of such questions in the input. In comparison, the three Norwegian children produce target-consistent *wh*-questions in 96% of the relevant utterances collectively (Westergaard, 2009a).

(24) What movie did I saw? (Adam, 3;0.11) (Brown, 1973)

Westergaard (2009a) claims that neither a constructivist approach nor a generativist approach can fully account for the Norwegian children's acquisition of word order in questions. She extends this claim to include Adam's acquisition of word order in questions as well, and instead, presents a cue-based approach to language acquisition based on Lightfoot (1999), as seen in section 2.2.2. As noted in said section, Westergaard (2009a) argues that children must be sensitive to a set of smaller-scale cues, and where Adam is concerned, she argues that he

possesses a "SMALLER V2 grammar than that of adult English" (p. 1046) and that children make finer distinctions within the grammar than adults. In Adam's case, he seems to make a distinction between copula BE and auxiliaries in that BE is very rarely attested in his data with uninverted word order compared to auxiliaries. More importantly, this distinction is not found in the input.

3.4 An account of the acquisition of verb movement in one bilingual child

In Bentzen (2004) the acquisition of verb movement in one bilingual child, Emma, is investigated. Emma was born and raised in Tromsø with a Norwegian father and an American mother. She is thus a speaker of the Tromsø dialect of Norwegian and American English. Her parents claim only to use the English language when addressing Emma, with a few exceptions, see Bentzen (2004). She attends Norwegian day-care and receives only Norwegian input while she is there. The study is based on a corpus of audio-recordings which were made at weekly intervals with either her parents or an outside investigator. In the recordings with her parents, Emma spoke English, and with the investigator, she spoke Norwegian.

With regards to *yes/no* questions, Bentzen (2004) finds that Emma inverts in a target-like fashion with both auxiliaries and BE in English. Examples are provided in (25) and (26). However, there are quite frequent examples of utterances where Emma produces a *yes/no* question with an inverted main verb as well, as seen in (27). Bentzen (2004) further notes that in the 12 *yes/no* questions which require *do*-support, only two of them are produced with the insertion of *do* and that only one of the two is target-consistent. In ten of these questions, Emma produces sentences where the main verb and the subject have been inverted. In addition, out of a total of 33 negated structures that require *do*-support, Emma produces only three utterances in which she inserts the dummy-auxiliary. This leads Bentzen (2004) to conclude that "Emma has not yet acquired the intricate system of *do*-support in English" (p.166).

(25)	Can you find that in the bedroom?	(Emma, 2;7.14) (Bentzen, 2004)
(26)	Is it summer now?	(Emma, 2;8.17) (Bentzen, 2004)
(27)	*Have I a skirt? 'Do I have a skirt?'	(Emma, 2;9.2) (Bentzen, 2004)

Bentzen (2004) claims that the reason for Emma's trouble with verb placement might be the result of both conflicting cues in the input as well as economy. The conflicting cues, in this

case, are the Norwegian cue structure that tells Emma that she should move V-to-I-to-C in all topicalized structures, and the English cue structure that tells her that V should stay in situ. However, since the primary interest of this thesis is word order in questions, the conflicting cues are not relevant to us, as the word order for both Norwegian and English are identical. The part of Bentzen's analysis that we do find relevant is economy.

According to Bentzen (2004), economy has traditionally been defined in terms of a derivational cost within the minimalist approach to syntax, and that "language learners initially will favour the least costly […] derivations when acquiring a language" (p. 171). Further, she notes that if we are to follow this idea, we must "assume that bilingual children faced with two alternative analyses would be more liable to transfer the less costly construction into the language with the more costly alternative than vice versa" (p. 171). In Emma's case, one would then assume that the arguably more straightforward SVO word order of English, i.e. the less costly structure, would be overgeneralized and transferred into her Norwegian as well. However, as Bentzen (2004) points out, this is not the case. Henry & Tangney (1999) makes a slightly different interpretation of the minimalist account which claims that the weak features of a grammar are not always the least costly ones. Instead, they argue that a consistent grammar is simpler than one which exhibits inconsistencies regarding feature specifications. That is, the V2 word order of Norwegian can arguably be seen as less costly than that of English which exhibits both SVO and V2. Following this argument, one should assume that if Emma was to transfer any elements in any direction, she would overgeneralize the V2 structure of Norwegian into all topicalized structures in English as well. However, such an assumption is problematic as well, seeing as Emma is a speaker of the Tromsø dialect which, as we know from section 2.5, contains some optionality in *wh*-questions where word order is concerned. In other words, both English and Emma's dominant language can be argued to exhibit inconsistent word orders in questions. While Bentzen (2004) points out that Emma seems to make clear distinctions between the two grammars of Norwegian and English, occasional utterances in English do exhibit V2 word order where verb movement is not required. Thus, while it remains unlikely that Emma transfers word order in any way based on economy principles, one might argue that it is less costly to move the main verb than to insert *do*, making it a possible reason for Emma's trouble with inserting *do* in the required structures.

3.5 Predictions

Based on the theory and previous research presented in the two chapters above, we can make assumptions about Hedda. First of all, as we saw in section 2.4.1, a bilingual's two languages are both active at all times in varying degrees depending on various factors, e.g. language mode. In addition, we saw in section 2.3.1.1, that children are assumed to choose the option which does not involve movement of a syntactic element, i.e. the less costly option, when acquiring a language. In the same section, we saw that Bentzen (2004) argued that children might choose the option that does involve movement if said movement leads to greater consistency in the grammar. Based on this we have formulated prediction 1.

Prediction 1:

Because Hedda's dominant language, Norwegian, is active at all times, even when she is speaking English, Hedda will produce English question in which she moves the main verb, because the same movement is grammatical in Norwegian.

We saw in section 2.5 that the Tromsø dialect allows non-V2 in *wh*-questions with a short *wh*-element. Combined with the fact that both Norwegian and English requires that the functional element be inverted when it is present in the structure, makes it is possible that Hedda will produce target-consistent questions in English, where the main verb stays in situ and an auxiliary or BE is inverted. Thus, we have made prediction 2.

Prediction 2:

Hedda will produce questions in which the main verb stays in situ, and the functional element (Aux, BE) is inverted (target-consistent) because this word order is target-consistent in both standard Norwegian, the Tromsø dialect, and English.

However, while standard Norwegian, including the Tromsø dialect, allows any lexical verb to move across the subject, the Tromsø dialect allows non-V2 in certain *wh*-questions which makes it possible that Hedda will produce English questions without any verb movement at all. This has been formulated as prediction 3.

Prediction 3:

Because the Tromsø dialect allows non-V2 in certain wh-questions, Hedda will produce questions in which the main verb stays in situ, but no functional element is added nor moved to second position (non-target-consistent).

Furthermore, from an economy perspective, we must make a fourth prediction

Prediction 4:

Because it is considered more economical to leave an element in situ than it is to move it, we predict that Hedda will make many more utterances in which she leaves the main verb in situ and omits the functional element, than utterances in which she moves the main verb.

Based on prediction 3 and the fact that Norwegian does not require a dummy-auxiliary where one is not present in the initial structure, we make one last prediction as seen in prediction 5. Furthermore, as seen in section 2.5, structures missing the insertion of *do*-support is quite common for monolingual English children too, making it even more likely that Hedda will produce them as well. On the basis of this, we have made this last prediction.

Prediction 5:

Hedda will produce structures where she omits the insertion of a dummy-auxiliary (*do*-support) when said insertion is syntactically required.

3.6 Summary

In this chapter, we have seen that V2 word order is generally acquired very early and that in cases where optionality occurs, both word orders are acquired simultaneously. Furthermore, the findings of three accounts of previous research on the acquisition of word order were presented. Two of the accounts present data from one monolingual English child, and the last one presents data from one Norwegian/bilingual child. These findings will be discussed further in relation to Hedda later on in chapter 6. At the end of the chapter, five predictions based on the findings of these three accounts and the theory from chapter 2, were presented. Now we move on to a presentation of the methodology used in this thesis.

4 Methodology

4.1 Introduction

In this chapter, we will present the methodology used for collecting and analysing the data for this thesis. Further, we will give a presentation of Hedda, and an account of both the reliability and validity of the methods we have used, and thus, the reliability and validity of results as well. The results themselves, will be presented in chapter 5.

4.2 Hedda – some background information

The child under investigation, Hedda, was born in 2013 and lives in Tromsø, Norway. She has a Norwegian mother and an American father. Her father does speak Norwegian and consistently does so with Hedda's mother, although he has always addressed Hedda in English, while Hedda's mother consistently addresses her in Norwegian, i.e. they are employing the 1P/1L strategy. According to Walla (2017), "[e]xceptions to the 1P/1L strategy occur most often when there are people around who don't speak Norwegian, and the mother frequently uses English with Hedda in these cases" (p. 24). Furthermore, Hedda attends a Norwegian speaking *barnehage* – 'day-care', which combined with her home situation makes the portion of Norwegian input much larger than the portion of English input. As such, she is to be considered an unbalanced bilingual, at least in terms of input.

Walla (2017) examines the code-mixing habits of Hedda in both Norwegian and English. She finds that Hedda's code-mixing is dependent on language context, in that she uses her two languages differently within different contexts. The time frame for Walla's study is naturally shorter than ours, 2;3-3;3 compared to 2;3.10-4;3.28, given that data collection for the Hedda corpus is still ongoing. In the recordings investigated by Walla (2017), Hedda displays a marked dominance in Norwegian, and for most of these recordings, only a few utterances contain English words only, even when Hedda is at play with an English-speaking interlocutor. Quite a lot of the utterances Hedda makes in these contexts contain code-mixing, and many are even exclusively in Norwegian. However, it is noteworthy that the number of utterances containing English words only, increase in the later recordings.

With regards to Grosjean's (2008) model of language modes, one might say that Hedda spends a large portion of her time in a monolingual Norwegian mode, e.g. in *barnehage* or home alone with her mother. Another large portion of her time is spent in a Norwegian/English bilingual

mode, e.g. when both parents are at home, or in the company of an interlocutor and one or both parents. The latter is the case for most of the recording sessions investigated in this thesis. As for Hedda being in a monolingual English mode, this very rarely happens, except for a few short trips abroad to English speaking countries, and even these do not necessarily qualify as a monolingual English mode, as she most likely is in the company of one of her parents for most of the time. Although Hedda's father only addresses her in English, he does accept responses in Norwegian, and as such, the recording sessions where Hedda is at play or in conversation with her father do not qualify as a monolingual English mode either.

4.3 Data collection

The data on which this thesis is based come from a dense corpus of naturalistic recordings of one bilingual child, Hedda. The corpus contains over one hundred hours of recorded data, although not all of these recordings have been transcribed yet due to the project still being ongoing. The recording sessions under investigation in this thesis, amount to 32.68 hours of data, which entail the period from 2;3.10 to 4;3.28. An overview of the files under investigation can be seen in table 2 at the end of this section.

The data were collected using audio-recordings of the child at play or in conversation with either her mother, her father or an outside investigator at varying intervals. This way of collecting data ensures that Hedda's speech production is spontaneous and not premeditated, and thus, gives a more accurate picture of her language production. In the recordings with her mother, both Hedda and her mother speak Norwegian. In the recordings with her father, Hedda, occasionally speaks English, but mostly, she speaks Norwegian, while her father speaks English. In the recordings with an investigator, Hedda primarily speaks English. For this thesis, we have chosen only to investigate the recordings in which Hedda speaks English, i.e. the recordings where she is at play with her father or with an investigator.

The recordings have first been transcribed and then proofread using the transcription program ELAN (Wittenburg et al., 2006). Following the proofreading, they were analysed using CLAN (Computerized Language ANalysis) (MacWhinney, 2000). ELAN is a digital tool for the creation of linguistic annotations from video and audio files. In the program, annotations can be grouped in tiers, creating the possibility of transcribing multiple speakers separately, and thus, making analysis of only one of the speakers in the transcribed file much easier. The finished transcription can then be exported into a CHAT file (.cha), which is the one used for analysis in CLAN.

CLAN (MacWhinney, 2000) is a program designed specifically to analyse data transcribed in the CHAT format. The program lets one analyse a number of linguistic and morphosyntactic features, e.g. MLU (Mean Length per Utterance) or the frequency of certain words spoken by a given subject, using different commands; the long list of varying commands can be found in the CLAN-manual (MacWhinney, 2000). For this thesis, we have used two different commands, as they combined gave us the information we needed for further analysis. The first of these commands reveals Hedda's MLU through the files provided for analysis, and the second creates a list of all the sentences where a question mark appears, i.e. all the questions Hedda asks. While providing the utterances needed for analysis, the latter of the two also yield a lot of irrelevant structures, e.g. one-word utterances, see (28), or utterances made in response to something the investigator said, see (29). In fact, of the total 427 utterances the data yielded, 91 (21%) were deemed unusable or irrelevant for various reasons. The relevant utterances were then sorted into eight different categories, where four are categories of English production, and the remaining four are of Norwegian production. The four categories of English production are, naturally, the ones of most interest to this thesis, but as Hedda is bilingual, the categories of Norwegian production will be relevant as well. The results and categories will be presented in chapter 4.

(28) What? (Hedda, 3;5.25)

(29) *INV: Where did you go on your trip? (Hedda, 3;0.4)
*FAT: Where did we go?
Where did we go?
On our trip?
*CHI: On our trip?

In section 2.4.2, we saw that relative measures of language input are not ideal for predicting child output, but while a presentation of Hedda's absolute input might have been possible, it lies beyond the scope of this thesis and would be impossible to determine based on the data files alone. To accomplish such a task, one would have to record and transcribe all of the input Hedda receives on an average day both in *barnehage* and at home. One would then have to count all the unique words in each language to determine the exact amount of input received in each language. Preferably this would be done at least twice to get an accurate picture of what an average day for Hedda looks like.

Another way of calculating how much input Hedda receives in each language is to use a very detailed parental questionnaire. Simply put, this questionnaire asks the parents to estimate on a five-point scale how much time the child spends in the company of different persons in different situations. The parents are then asked to estimate on the same five-point scale, how much the person(s) with whom the child spends her time uses the target language. Finally, the amount of time each person spends with the child is multiplied by how much the given person uses the target language, and then the total number of hours of exposure to the target language is divided by the child's waking hours in one week. For a more detailed explanation of how one calculates language exposure using this model, see Unsworth (2013). For this thesis, we have not had time to employ questionnaires such as the one elaborated on here, and as a result, we must rely on relative measures of input in our analysis.

Table 2

Recording time [h]:mm:ss	Age
1.13.32	2;3.10
1.37.23	2;4.0
1.35.06	2;6.10
1.07.33	2;7.14
1.05.50	2;7.21
1.42.04	2;8.11
1.04.59	2;8.18
1.20.23	2;8.28
1.22.21	2;9.1
1.08.17	2;9.8
0.45.16	2;9.22
1.37.42	2;11.17
1.26.10	3,0.4
1.19.42	3;1.5
1.49.15	3;1.19
2.02.29	3;2.22
1.25.36	3;3.2
1.43.19	3;5.25
1.16.49	3;6.22
0.57.07	3;9.6
0.11.50	3;10.17
0.34.28	3;11.13
0.20.32	4;0.30
0.16.37	4;1.8
0.58.00	4;1.11
0.19.25	4;1.16
1.01.30	4;2.15
0.17.01	4;2.25
0.03.14	4;3.5
0.08.43	4;3.13
0.25.44	4;3.15
0.11.21	4;3.26
0.11.58	4;3.28

4.3 Reliability and validity

Let us begin with the recording process. We are interested in Hedda's spontaneous speech, and using a strict definition that reliability is the extent to which a test, measuring procedure, or experiment will yield the same result in repeated trials, we must assume that recordings will in fact not yield the same results as they are recordings of spontaneous speech. We can instead ask if naturalistic recordings are a well-suited way of collecting data about a given subject's spontaneous speech. If the answer is yes, which it is, we must conclude that the reliability of the recording process is high.

Where the validity of the recordings is concerned, we must take a look at what is actually recorded. As stated, we are interested in Hedda's spontaneous speech production, but to determine the validity of the recordings, we need to take a look at what kind of utterances she is producing – is the production rehearsed and premeditated, or is it indeed spontaneous? Considering that the recordings are of Hedda at play or in conversation with an investigator, we must assume that her production is neither premeditated nor rehearsed. We must also consider the quality of the recording equipment – is the chosen recording device able to record the conversations with the sound quality necessary for intelligibility, and later, transcription? Knowing that more or less all the utterances made by the investigator are transcribed without trouble, we must assume that the recording device is up to par, even if some of the utterances made by Hedda herself are unintelligible. We must then conclude that both the reliability and validity of the recording process is high.

Moving on to the transcriptions, we must consider whether the results of multiple transcriptions of the same audio-file will produce the same result, i.e. will one transcriber hear the same as another, and thus transcribe the same utterances identically? We deem the reliability of the transcription process to be high as well, due to the fact that most of them have been proofread after transcription. However, some utterances have been near impossible to transcribe due to unintelligibility. Nevertheless, these would probably also have been hard to understand in the situation in which they were spoken, and as such, would be of no value to us.

When considering the validity of the transcriptions, we must ask whether the transcribed files tell us anything about Hedda's spontaneous speech. Given the naturalistic nature of the recordings, they provide suitable examples of Hedda's spontaneous speech. In the transcription process, all utterances must be transcribed as precisely as possible, and therefore, we would argue that this makes the validity of the transcription process reliant on the validity of the

recording process. As we have already deemed the recording process to be valid, we must also deem the transcription process to be so.

Lastly, we have the extraction and analysing of data using CLAN. In terms of reliability, we would, again, argue that it is quite high. In this thesis, we are interested in Hedda's production of *yes/no* and *wh*-questions, and to get an overview of these without having to read through all 33 hours of transcribed audio-files, we entered a command in CLAN that produces every utterance in which a question mark appears. This ensured that every question that Hedda asked was included and could be subjected to analysis. As mentioned, this did include a lot of irrelevant material as well, but it was the only way we could find that would ensure the inclusion of all the questions. Nevertheless, the inclusion of all the questions combined with many careful rounds of counting and sorting into categories helps make the reliability of this process high.

The results that the data provide are highly relevant to this thesis. They give us a general idea of the word order with which Hedda produces questions, enabling us to look for patterns and draw possible conclusions. At the same time, they provide us with relevant examples of these utterances. With this in mind, the validity of the analysing process is argued to be quite high as well.

4.4 Summary

In this chapter, we have described the methods used in collecting the data for this thesis, along with a short overview of who Hedda is and what her language situation is. At the end of the chapter, we discussed the reliability and validity of all the processes involved in both data collection and analysis, all of which were deemed to be quite high. In the next chapter, we move on to a presentation of the results.

5 Results

5.1 Introduction

In this chapter, we present Hedda's MLU in the transcribed data files and give brief comments about how this has changed over time. Following that, we present a general overview of Hedda's production of *yes/no* and *wh*-questions in terms of target-consistency in both English and Norwegian. Lastly, we present an in-depth distribution of Hedda's production of *yes/no* and *wh*-questions in English, i.e. does she have SAI in the structures requiring it, and does she use *do*-support in the structures requiring it. In chapter 6 the results will be discussed and analysed in relation to the research questions, as seen in chapter 1, and the predictions in chapter 3.

5.2 Mean Length per Utterance

Figure 2 shows the distribution of Hedda's varying MLU and standard deviation through the data files, as well as her age at the respective times of the audio-recording sessions. The total of 33 files investigated in this thesis cover Hedda's age between 2;3.10 and 4;3.28. We can see that between ages approximately 2;3 and 3;3, Hedda's MLU has varied from 1.896 words at the lowest to 3.094 words at the highest. From ages approximately 3;3 to 4;3, we a see a similar increase in MLU with 2.042 words at the lowest and 4.685 words at the highest. While there is much variation in Hedda's MLU throughout the two periods, we find a general increase in MLU from the beginning to the end of the recording period. Natural variation in MLU is also to be expected due to the naturalistic nature of the recordings.

Age	*2;3.10*	*2;4.0*	*2;6.10*	*2;7.14*	*2;7.21*	*2;8.11*	*2;8.18*	*2;8.28*	*2;9.1*	*2;9.8*	*2;9.22*	*2;11.17*	*3;0.4*
MLU	1.896	1.928	2.458	2.202	2.174	2.624	3.053	2.279	2.451	2.223	2.818	2.979	2.251
Standard deviation	1.105	1.359	1.624	1.514	1.594	1.666	2.243	1.673	1.591	1.421	1.960	2.145	1.645
Age	*3;1.5*	*3;1.19*	*3;2.2*	*3;2.22*	*3;5.25*	*3;6.22*	*3;9.6*	*3;10.17*	*3;11.13*				
MLU	2.726	2.800	2.735	3.094	3.023	3.282	3.260	4.000	2.771				
Standard deviation	2.109	2.206	2.054	2.311	2.209	2.519	2.475	3.608	2.253				
Age	*4;0.30*	*4;1.0*	*4;1.11*	*4;1.16*	*4;2.15*	*4;2.25*	*4;3.5*	*4;3.13*	*4;3.15*	*4;3.26*	*4;3.28*		
MLU	4.685	2.926	3.374	3.617	3.224	4.205	3.071	3.000	2.042	3.193	3.165		
Standard deviation	3.379	2.425	2.430	3.375	2.702	2.863	1.689	2.226	1.821	2.298	1.875		
	2018	2017	2016										

Figure 2

One should expect that the frequency of single-word utterances and structures that are otherwise irrelevant to the investigation is quite high. However, as noted earlier, only 21% of the utterances found in the transcription files were in fact, inadmissible. Furthermore, we can see

that Hedda's MLU indeed has increased over time, as expected. This indicates that the files from 2017 and 2018 might be of greater interest to this study, as one would expect that her use of the English language will have increased over time.

5.3 English vs. Norwegian production

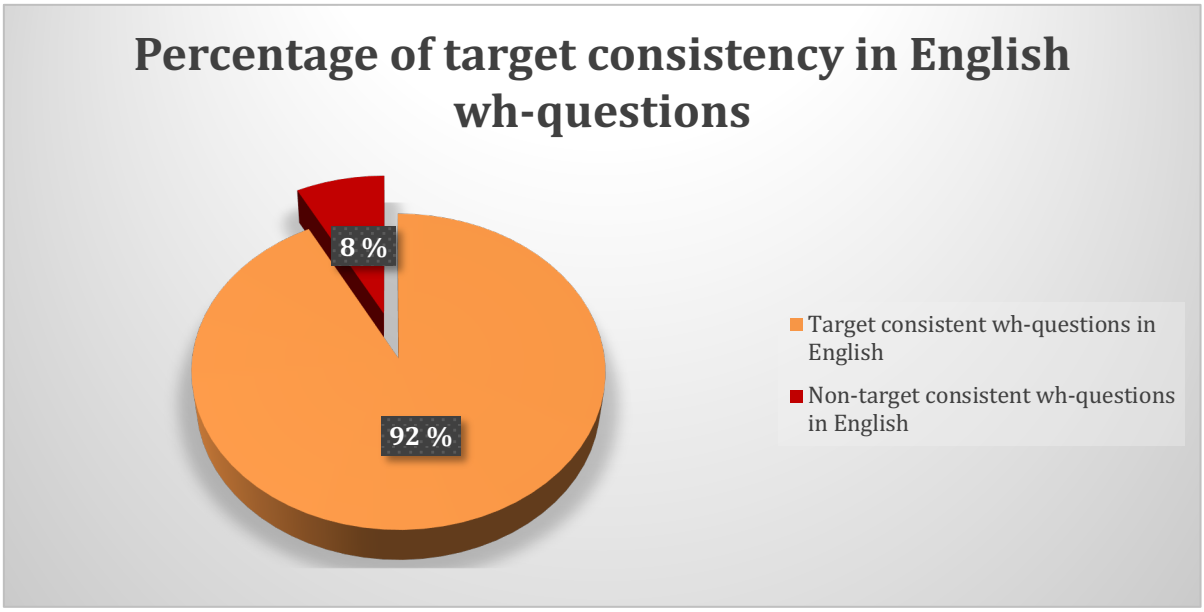

Figure 3

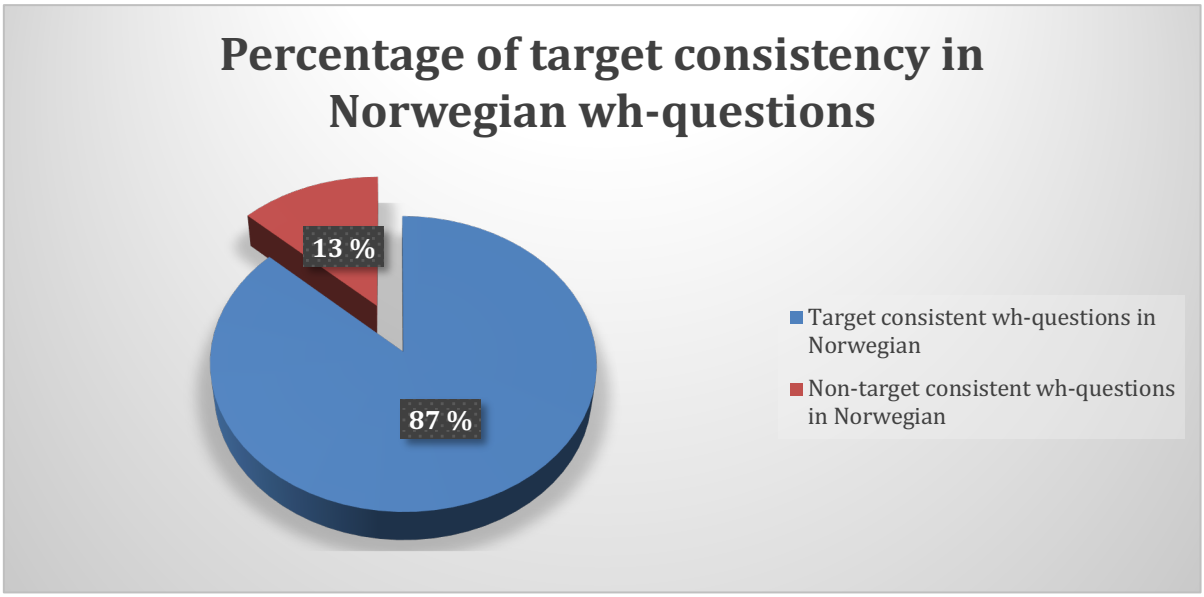

Figure 4

Let us start by looking at Hedda's production of *wh*-questions. Figure 3 shows the distribution of target-consistency in *wh*-questions in Hedda's English production. By comparison, figure 4 shows the corresponding distribution of target-consistency in her Norwegian production. Although we are mainly interested in Hedda's English production, her Norwegian production

has been included for comparison. However, her Norwegian production will only be used as a tool to better understand her English production and will not be analysed by itself as such.

What is perhaps the most interesting feature of the two figures, is that they show quite similar distributions between target-consistent and non-target-consistent production in both languages where *wh*-questions are concerned. And further, that Hedda's English production of *wh*-questions is target-consistent in 92% (24/26) of all relevant utterances, while her Norwegian production of the same type of questions is target-consistent is 87% (100/115) of all relevant utterances, i.e. percentage-wise, she is more target-consistent in her English production than in her Norwegian production. However, a percentage presentation might be a bit unfair, as the numbers of uttered *wh*-questions in English and Norwegian are vastly different. That being said, of the 26 *wh*-questions she utters in English, only two are not target-consistent. We will come back to and analyse this in more depth in section 5.4.1, where we will take a look at precisely what kinds of utterances she makes.

Next, we will take a look at Hedda's production of *yes/no* questions. As with the *wh*-questions, both production in English and Norwegian has been included. Figures 5 and 6 show a percentage distribution of target-consistent vs. non-target-consistent production. At first glance, we can see that her target-consistency-rate is much more uneven between the two languages where *yes/no* questions are concerned. In her Norwegian production, she is target-consistent in 93% (136/147) of all relevant utterances, while her English production of *yes/no* questions is target-consistent in 50% (22/44) of all relevant utterances. Once again, we have chosen to present these data in percentages, as it gives an easy overview of her production in the two languages, but also here, the number of utterances in Norwegian is much higher than the corresponding number in English.

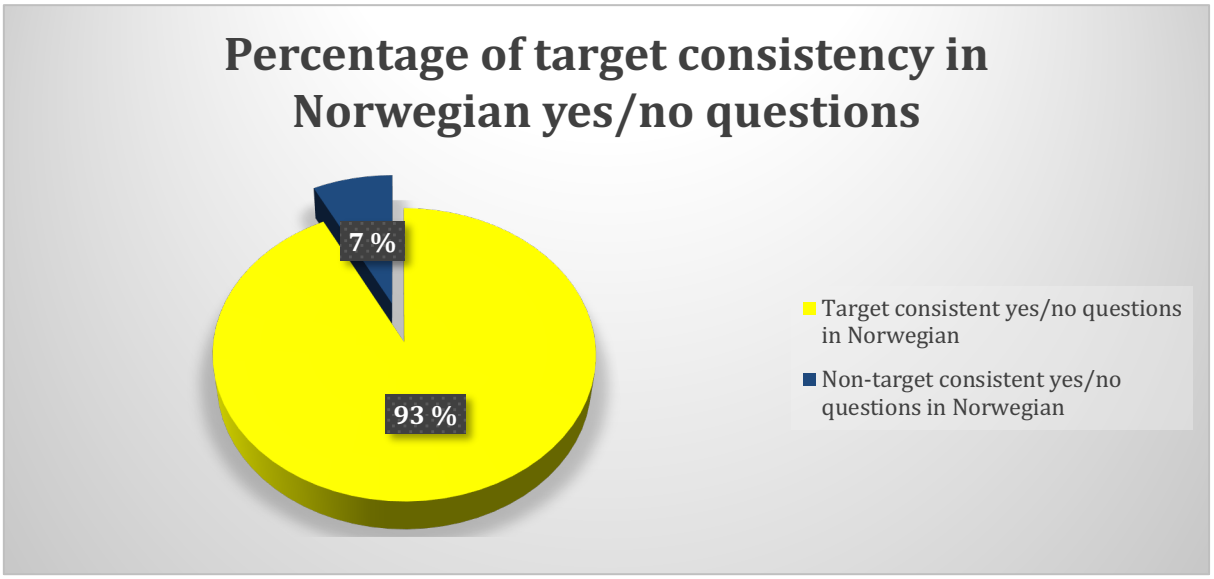

Figure 5

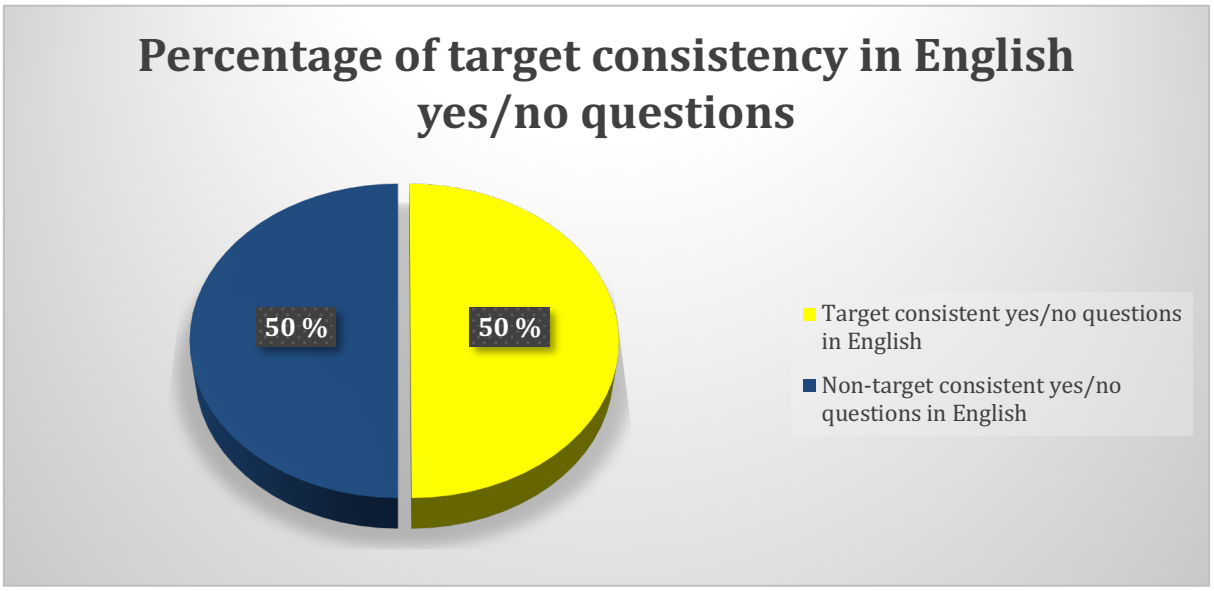

Figure 6

5.4 In-depth presentation of question production

5.4.1 *Wh*-questions

As noted above, Hedda's production of English *wh*-questions is target-consistent in 24 out of 26 (92%) utterances. The question is, what is the nature of the non-target-consistent utterances she does make and what kind of target-consistent structures does she produce? The distribution can be seen in figure 7. Of the two utterances which are not target-consistent, one lacks either an auxiliary or *do*-support depending on Hedda's intentions, and the other has an inverted main verb. The utterances can be seen in (30) and (31) respectively.

(30) *What you do? (Hedda, 4;1.11)
'What do you do?'

(31) *Why did you that? (Hedda, 4;2.15)
'Why did you do that?'

What is perhaps most intriguing about the two utterances in (30) and (31), is that if one were to directly translate these sentences into the Tromsø dialect (*ka du gjør?, korfor gjorde du det?),* they would be perfectly grammatical. The structure in (30) is an example of a structure where non-V2 would be preferred in the Tromsø dialect, and the one in (31) does not require an auxiliary or dummy-*do* in Norwegian because the main verb *gjorde* is allowed to move across the subject and into second position. Thus, one might easily assume that this is the result of non-facilitative CLI, where Hedda believes that the verb 'did' is the main verb, and as moving the main verb would be grammatical in Norwegian, she assumes that it would be grammatical to do so in English as well. We will discuss this further in chapter 6.

Interestingly, out of the 24 *wh*-questions Hedda produces target-consistently, 15 are with the question word 'what'. And while the question words 'why', 'how', 'who', and 'where' are attested in the data, they do not appear nearly as frequently. Similar patterns of production have been found in monolingual English children as well, see e.g. Rowland & Pine (2000; 2003). 'Where' is the second most frequent *wh*-word in Hedda's data, and that is only attested six times. 'Why' is only attested twice in the data, and as shown in (31) one of them is produced in a non-target-like manner.

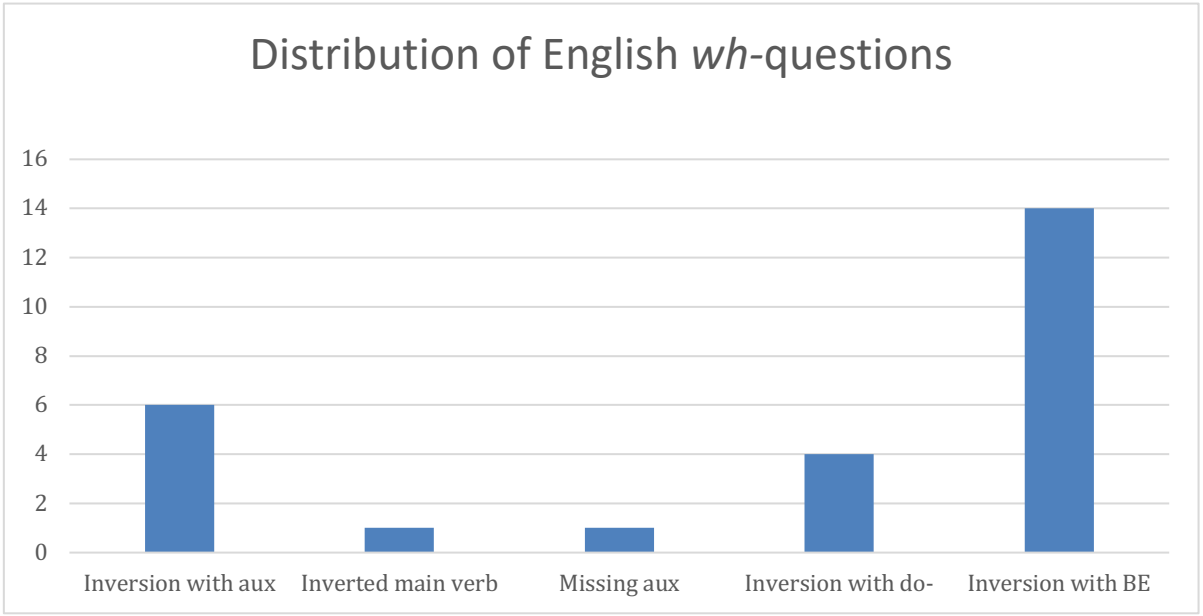

Figure 7

Figure 7 shows that most of Hedda's *wh*-questions are with copula BE and that she produces these structures with 100% target-consistency. An example is provided in (32e), which incidentally also is the one example of a target-consistent question with 'why'. The figure also shows that she produces *wh*-questions that require *do*-support five times, four of which are target-consistent, exemplified in (32d). Lastly, it shows that Hedda produces target-consistent *wh*-questions with SAI in all the structures requiring it, excepting one structure which requires *do*-support where no dummy-auxiliary has been added. Examples of all the categories mentioned in figure 7 can be seen in (32a-e).

(32) a. Inversion with aux:
What are you building? (Hedda, 3;5.25)

b. Missing *do*-support:
*What you do? (Hedda, 4;1.11)
'What do you do?'

c. Inverted main verb:
*Why did you that? (Hedda, 4;2.15)
'Why did you do that?'

d. Inversion with *do:*
How do we do? (Hedda, 4;2.15)

e. Inversion with BE:
Why is he here? (Hedda, 4;2.15)

5.4.2 *Yes/no* questions

Moving on to Hedda's production of *yes/no* questions, we see from figure 8 that there are more utterances to analyse in this category and that more of them are non-target-consistent. As mentioned above, Hedda makes a total of 44 utterances within this category, and half of them are non-target-consistent. As we can see, the most common reasons for the utterances being non-target-consistent are missing *do*-support and code-mixing. Examples of the two from the transcribed data can be seen in (33f) and (33b). However, even if code-mixing has been counted as non-target-consistent in figure 6, code-mixing should not be counted as non-target-like in terms of word order, as all of the utterances in which Hedda mixes are produced with either

Norwegian or English target-like word order. In section 5.4.3, we will provide a brief overview of Hedda's code-mixing habits and compare them to Emma's habits.

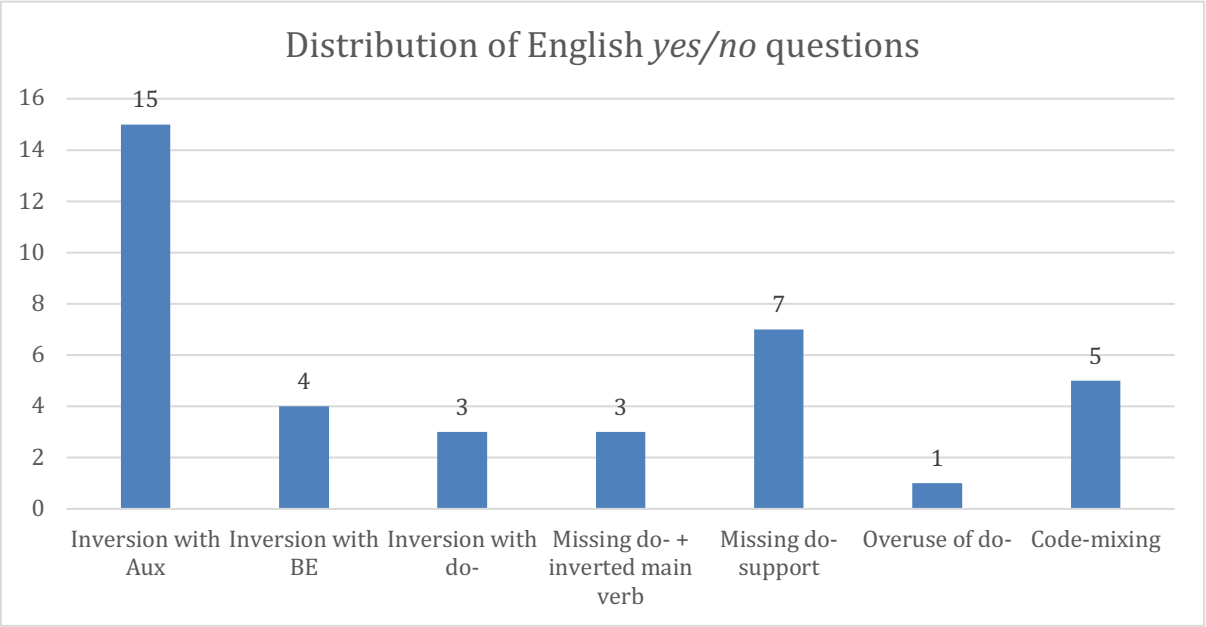

Figure 8

(33) a. Missing *do* + inverted main verb:

*Have you this? (Hedda, 3;1.5)

'Do you have this?'

b. Code-mixing:

Kan du bite me? (Hedda, 2;8.11)

Can you bite me?

'Can you bite me?'

c. Inversion with BE:

'Is there anybody round?' (Hedda, 3;5.25)

d. Inversion with Aux:

Can I come in there? (Hedda, 3;5.25)

e. Inversion with *do*:

Did you know that? (Hedda, 3;9.6)

f. Missing *do*-support:

*You have (…) a foot like this? (Hedda, 4;1.11)

'Do you have a foot like this?'

g. Overuse of *do*:

*Do you be (.) like this? (Hedda, 4;3.13)

'Are you like this?'

The utterance in (33a) lacks *do*-support, but as we can see, there is also an inversion error in this sentence. The structure requires SAI, but instead of inserting *do*, Hedda has inverted the main verb 'have'. In section 2.5, we saw that verb movement in English is restricted to auxiliaries and BE, making the movement of the main verb ungrammatical. Once again, we can discern the possibility of non-facilitative CLI, as the sentence with the same structure in Norwegian would be grammatical. Figure 8 also shows that there is one utterance that displays overuse of *do,* which is interesting because it shows a possible attempt at using *do*-support, albeit in a structure that does not require it. This utterance can be seen in (33g).

Hedda also produces 22 *yes/no* questions target-consistently. Fifteen of these are utterances with SAI, four are utterances with subject-copula inversion, and the last three are utterances with target-like insertion of *do*-support. Examples of the three different structures can be seen in (33d), (33c), and (33e) respectively. What is more, we can see from figure 8 that Hedda makes target-consistent utterances with *do* in only 3/13 cases in *yes/no* questions where *do*-insertion is required. In the remaining 10 of these utterances, Hedda either omits the insertion of *do* or omits the insertion of *do* and instead inverts the main verb. The former was shown in (33f) and the latter in (33a). Lastly, these results tell us that Hedda does not seem to have much trouble with inverting either an auxiliary or BE, as she mostly produces target-consistent *yes/no* questions in which one of them is present. They also tell us that she seems to struggle with structures where an auxiliary or the copula is not present initially, and the insertion of a dummy-auxiliary is required.

5.4.3 Code-mixing – a sign of high or low competence in the target language?

As noted in section 2.4.4, code-mixing is the term used to describe when a bilingual mixes morphemes or words from two or more languages within a single utterance. As such, it is to be considered a feature of language production present only in the speech of bilinguals due to them having two or more lexicons to choose from. It was further noted in the same section that code-mixing could be seen as a means for the speaker to express their wants and needs when the lexicon of the target language is incomplete, e.g. when the speaker wants to communicate that he/she has seen a moose, he/she might use the Norwegian word *elg* because the equivalent word

in English ‘moose’ has not yet been acquired. It was further argued in chapter 2 that language input is vital for the acquisition of new words, and it would thus be natural to assume that the utterances made by Hedda and Emma which exhibit code-mixing are due to missing words in the target language lexicon. However, as we shall see in the following, this seems not to be the case.

We saw in the previous section that Hedda produces five *yes/no* questions that exhibit code-mixing, but that four of these were produced with target-like word order, i.e. with inversion. Bentzen (2004) does not provide any exact numbers for how many instances of code-mixing Emma produces, but looking at the examples she provides we see that she does produce them. Bentzen also notes that Emma frequently uses the Norwegian word *du* in place of the English word ‘you’. In (34) and (35) we see examples of code-mixing from Emma’s and Hedda’s respective speech production. What we see from the two examples is that they are both uttered in a target-like manner and that the code-mixing is the only feature making them non-target-consistent. In fact, Hedda produces only one question that exhibits code-mixing without target-consistent English word order, see (36). Considering that Emma too mainly produces target-like questions in terms of word order even if she code-mixes, we must assume that code-mixing does not affect the acquisition of word order in any significant way for either of them. The utterance in (36) is not uttered with target-like English word order, but as the important part of the utterance is in Norwegian and the utterance is uttered with target-like Norwegian order, our assumption, that code-mixing is insignificant with regards to word order, is strengthened.

(34) Didn’t <du> take that? (Emma, 2;7.14) (Bentzen, 2004)

(35) He spill-s a piano? (Hedda, 3;1.5)
‘He plays a piano?’

(36) *Vet du koffor* æ close the door? (Hedda, 3;2.22)
‘Do you know why I am closing the door?’

It is also hard to find any evidence that either Hedda or Emma code-mixes due to lacking words in their acquired target language lexicons. In the 44 examples of Emma’s speech production provided in Bentzen (2004), seven exhibit code-mixing. Out of these seven, six are examples of Emma using the Norwegian word *du* in place of the English equivalent ‘you’, which according to Bentzen (2004), Emma does more or less consistently. This might be an indication that Emma does not know the word ‘you’, but it will be hard to determine if this is true based on the data. One the one hand, however, we can say that it seems unlikely that she does not

know the word, and the fact that she consistently chooses a Norwegian word when the target language is English might indicate that she does not fully distinguish between the two languages with regards to this particular word. It might also be that she simply believes that *du* is, in fact, an English word.

The words that Hedda occasionally mixes (*du* – 'you', *kan* – 'can', *vet* – 'know', *koffer* – 'why', *æ* – 'I', and *spille* – 'play') are attested in English elsewhere in the data, see (37a-e). This clearly demonstrates that Hedda does know all these words, and further indicates that the instances where she code-mixes are a sign that she too does not distinguish sufficiently between the two languages. It might also be that she does not remember the particular word in the target language at the moment of production. Either way, the fact that both Hedda and Emma code-mix occasionally does not seem to be of any importance to their production of target-consistent word order in *yes/no* and *wh*-questions, neither does it seem to indicate that the given words are lacking in their target language lexicons.

(37) a. What are you doing? (Hedda, 3;5.25)

b. Can I sit on that? (Hedda, 3;5.25)

c. Know that song? (Hedda, 4;2.15)

d. Why did you that? (Hedda, 4;2.15)

e. Play with lego (Hedda, 4;2.15)

5.5 Summary

In this chapter, we have provided the results of the investigation of Hedda's production of *wh*- and *yes/no* questions. We have seen that Hedda produces mostly target-consistent *wh*-questions (with a few exceptions) and that most of these utterances contain inversion with copula BE, and further that all her *wh*-questions with an auxiliary, excepting *do*, are produced with target-consistent inversion. Hedda's *yes/no* questions have been shown to be target-consistent in 100% of utterances that require inversion with an auxiliary, excepting *do*, as well as with BE, while her utterances that require *do*-support are produced in a non-target-like manner in 10 out of 13 cases. This combined with the fact that she uses *do* incorrectly once (inserting it in a structure where it is not required) makes *do*-support seem like a problem area for Hedda. At the end of the chapter, we also saw that Hedda's code-mixing does not seem to affect her production of

target-consistent questions in terms of word order. In the next chapter, we will discuss the predictions made in section 3.5 in light of these results. This discussion will be conducted in relation to language acquisition, CLI, input, language modes, and economy.

6 Discussion

6.1 Introduction

This thesis aims to discover what the nature of Hedda's production of English questions is and whether her production of these questions is affected by her dominant language Norwegian. In this chapter, the results presented in chapter 5 will be discussed in relation to our research questions and the predictions 1-5, made in section 3.5. This discussion will be done in light of the theory and previous research presented in chapters 2 and 3. For convenience sake, the predictions can also be seen below.

Prediction 1:

Because Hedda's dominant language, Norwegian, is active at all times, even when she is speaking English, Hedda will produce English question in which she moves the main verb, because the same movement is grammatical in Norwegian.

Prediction 2:

Hedda will produce questions in which the main verb stays in situ, and the functional element (Aux, BE) is inverted (target-consistent) because this word order is target-consistent in both standard Norwegian, the Tromsø dialect, and English.

Prediction 3:

Because the Tromsø dialect allows non-V2 in certain wh-questions, Hedda will produce questions in which the main verb stays in situ, but no functional element is added nor moved to second position (non-target-consistent).

Prediction 4:

Because it is considered more economical to leave an element in situ than it is to move it, we predict that Hedda will make many more utterances in which she leaves the main verb in situ and omits the functional element, than utterances in which she moves the main verb.

Prediction 5:

Hedda will produce structures where she omits the insertion of a dummy-auxiliary (*do*-support) when said insertion is syntactically required.

The chapter deals with one prediction at the time, starting with prediction 1, while all the time bearing in mind the research questions. Some comparisons between Hedda and Emma, as well as Hedda and Adam, will be provided throughout the chapter where such comparisons are deemed relevant.

6.2 'Why did you that?' – A discussion of non-facilitative transfer from Norwegian

In section 2.3.1, we saw that transfer or CLI is the effect one language might have on another (Cook, 2016). Such effects might be positive or negative, in the way that they either facilitate or do not facilitate acquisition. We predicted in prediction 1 that Hedda would produce non-target-consistent English questions in which she moves the main verb. This prediction was made on the basis of CLI, because the same movement would be perfectly target-consistent in Norwegian.

In chapter 5, we saw that Hedda produces a total of four questions in which she inverts the main verb, within the analysed data. One is a *wh*-question, and the remaining three are *yes/*no questions. All four can be seen in (38a-c). The one in (38b) is repeated, and thus there are only three examples instead of four. In section 5.3, we saw that Hedda produces a total of 26 *wh*-questions, and 44 *yes/no* questions in English within the data, which means that Hedda produces *wh*-questions with an inverted main verb in 4% of all relevant utterances, and *yes/no* questions with an inverted main verb in 6% of all relevant utterances.

(38) a. *Why did you that*?* (Hedda, 4;2.15)
'Why did you do that?'

b. *Have you this? (Hedda, 3;1.5)
'Do you have this?'

c. *Have you a blanket? (Hedda, 3;3.2)
'Do you have a blanket?'

All the utterances in (38) would have been target-consistent in Norwegian as they are produced with V2 word order. The only thing making them non-target-like in English are the restrictions on verb movement related to the target-language, as seen in section 2.5. Thus, all of the structures in (38) require the support of a dummy-auxiliary in order to be target-consistent.

We saw in section 3.4 that Emma too seems to struggle with the use of *do*-support. More specifically, we saw that Emma produces 12 *yes/no* questions which require *do*-support but that she only inserts the dummy-auxiliary in two of them, one of which is produced in a non-target-like fashion. Emma apparently produces more structures of this type than Hedda. However, Hedda is older than Emma for most of the investigated period, making an exact comparison impossible. Nevertheless, it is clear that both children produce structures in which they invert the main verb where verb movement is required, and as monolingual English children virtually never do this (Déprez & Pierce, 1993), we must assume that this type of structure is something that is only produced by either Norwegian/English bilinguals or L1 Norwegians acquiring L2 English.

In light of the previous paragraph, we are led to believe that Hedda transfers the Norwegian word order for questions in which no auxiliary nor the copula is present in the initial structure, into her English. And while there are few examples in the data of Hedda doing this, there are some, as seen in (38). The fact that both Hedda and Emma produce such questions, and monolingual English children never do, is a clear indication of non-facilitative CLI from Norwegian. Furthermore, this makes us conclude that prediction 1 is borne out.

6.3 Dialectal variety – CLI from the Tromsø dialect

As we saw in section 2.5, the Tromsø dialect allows non-V2 in *wh*-questions with a monosyllabic *wh*-element (Westergaard, 2009c), which means that the sentence in (39) would be perfectly grammatical if translated directly into the Tromsø dialect. As noted in section 5.4.1, this utterance is ungrammatical in English because it lacks either *do*-support or an auxiliary. However, as the same utterance would be grammatical in Hedda's other language, this utterance indicates that Hedda has transferred the non-V2 word order of the Tromsø dialect into her English in a non-facilitative manner.

(39)	*What you do?	(Hedda, 4;1.11)
	Hva gjør du?	(Standard Norwegian V2)
	Ka du gjør?	(Tromsø dialect non-V2)
	'What are you doing? – What do you do?'	

While the utterance in (39) might indicate that Hedda has transferred the word order of the Tromsø dialect into her English, this lone utterance cannot be seen as evidence that Hedda makes such utterances consistently. The utterance in (39) is the only *wh*-question attested in the

data in which no functional element is added nor moved, and in which the main verb stays in situ (4%), while there are seven *yes/no* questions in which this word order is produced (14%). If we were to claim that Hedda's data shows consistent evidence of non-facilitative CLI from the Tromsø dialect in her speech, we must assume that she makes such utterances often and that this would be well attested in the data. However, the percentages of *wh-* and *yes/no* questions in which non-inverted word order is attested suggests otherwise. Consequently, we cannot claim this.

Furthermore, as seen in section 3.3 in table 1, Adam produces *wh*-questions missing an auxiliary in 87,6%, 77,2%, and 57,0% of all relevant utterances in the three data points respectively (data point 1: files 19-24, data point 2: files 25-30, data point 3: files 31-36. Age: 2;11.28-3;8.14). The equivalent numbers for missing BE are 60,6%, 30,4%, and 14,2%, making *wh*-questions with missing auxiliaries the most common non-target-like structure in Adam's data. This tells us that while this type of utterance within Hedda's data could be considered a sign of non-facilitative CLI between the Tromsø dialect and English, we cannot claim this, because of two factors. Firstly, we do not have enough data to support such a claim, and secondly, the overwhelming attestation of this type of structure within the data of a monolingual English child tells us that this type of non-target-like utterances is common in English children's speech as well.

A meaningful comparison between Hedda and Adam is not possible because of the differences in age and length of the recording period. However, is it interesting to see that Hedda seems to have acquired the aspect of inversion with both aux and BE in English questions, while Adam seems to struggle with inverting auxiliaries. There might be many explanations for this, one is that Hedda is older than Adam for some of the recordings, but such an explanation would assume that she did leave out Aux/BE at an earlier stage and there are no indications in the data to suggest this. However, considering the age difference between Hedda and Adam, it is likely that at the time where she would have produced an abundance of such utterances like Adam does, she simply did not produce enough English for this to be attested in the data. Another possible explanation is that Hedda generally has a higher MLU in most of the data. Adam's MLU is calculated on the number of morphemes in each utterance, ranging from 2.14 to 4.54 per utterance (Rowland & Pine, 2000), while Hedda's MLU has been calculated on the number of words in each utterance, ranging from 1.896 to 4.685 per utterance. But once again, we must point out the age difference, as increasing MLU is expected as children age. The third possible explanation for why Hedda has acquired the aspect of inversion with Aux/BE, and Adam has

not, is also the one we believe most likely to be true. We would argue that Hedda has acquired this aspect out of facilitative CLI from Norwegian, i.e. because Hedda's dominant language requires verb movement to second position in questions, she has had little trouble acquiring the aspect of verb movement in English questions as well.

We predicted in prediction 2 and 3 that Hedda would produce both non-target-consistent English questions in which she leaves the main verb in situ, but does not add nor move a functional element, and target-consistent ones in which she inverts the functional element and leaves the main verb in situ. There are eight attestations of the former within Hedda's data, and a total of 22 attestations of target-consistent *yes/no* questions and 24 attestations of target-consistent *wh*-questions. Thus, both predictions 2 and 3 are borne out.

However, one last point needs to be made about the sentences in (38) and (39), and that is that they might be seen as evidence of transfer, even if they are attested very rarely. Moreover, if they are seen as evidence of transfer, they may not be seen as evidence that Hedda does not know how to produce them in a target-consistent manner. In section 2.3.1, we saw that there is a significant distinction between speech production and language knowledge (Cook, 2016). In other words, even if Hedda occasionally produces non-target-consistent utterances like the ones in (38) and (39), the fact that such structures are rarely attested in the data indicates that she does know the target-consistent way of producing such questions. In fact, the utterance in (40) might possibly be considered a target-consistent example of the question in (39), although such utterances are quite rare as well. This might indicate that Hedda is avoiding such structures because they are problematic for her. However, as target-consistent structures of this kind are attested in four out of five instances in the data, it is hard to tell with any certainty whether she is avoiding such structures or not.

(40) What are you doing? (Hedda, 3;5.25)

Furthermore, we know that Hedda is younger when she utters the target-consistent structure in (40) than when she utters the one in (39), which supports the assumption that Hedda knows how to produce these structures target-consistently, assuming that Hedda acquires more aspects of both Norwegian and English as she ages. It is also important to note that it is not clear what the intended message in (39) is. She might have intended to say 'what do you do?', which is a structure requiring *do*-support. In light of this, we would argue that in the instances where

Hedda produces such questions as the one in (38) and (39), it is a result of non-facilitative CLI pertaining to speech production only.

Considering the previous paragraph, it seems plausible that a bilingual's dual activation of both languages (Slabakova, 2016; Bialystok, 2009) noted in section 2.4.1, might be the cause of such interference in the speech of a bilingual. Bialystok (2009) claims that this makes lexical retrieval much harder for the bilingual person than for a monolingual one because the bilingual needs to choose a word from the target lexicon that at the same time meets all criteria for form and meaning. As a consequence, we must assume that Hedda's language processing and production is affected by this interference, based on the fact that the non-target-like utterances of this sort are so rarely attested in her data and that the data support the claim that she does know how to produce similar structures target-consistently.

6.4 A discussion of economy

As noted in section 2.3.1.1, within minimalist theory (Chomsky, 1995) it is considered more economical to leave a syntactic element in place than it is to move it. Based on this we predicted that Hedda would make more utterances in which she leaves the main verb in situ than utterances in which she inverts the main verb (prediction 4). Overall, this seems to ring true, as all of the English questions Hedda produces target-consistently will invariably be questions in which the main verb stays in place. We have seen that she produces *wh*-questions with 92% target-consistency, and *yes/no* questions with 50% target-consistency. However, as the word order for questions is identical in Norwegian and English in this regard, the high rate of target-consistency was expected. On several occasions throughout this thesis, we have noted that the Tromsø dialect allows non-V2 in certain *wh*-questions depending on the length of the *wh*-element and information structures. Prediction 4 thus became more specialized in that we predicted that Hedda would produce more questions in which she leaves the main verb in situ and omits the insertion and movement of a functional element, than questions in which she moves the main verb.

In the two previous sections, we saw that Hedda produces English questions with both of the word orders noted in the previous paragraph. From a minimalist point of view, it would be considered more economical to choose the word order that does not require movement (non-V2), which is the basis for prediction 4. This economy principle seems to affect Hedda's production of questions in English to some extent, as she produces fewer questions with an inverted main verb than questions that exhibit no verb movement and no functional element,

respectively four and eight. Prediction 4 is then borne out, and we must conclude that CLI in terms of economy seems to be of some significance to Hedda's production of English questions, although the extent of significance remains uncertain due to limited data.

6.5 'How do you do it?' – The problems of inserting a dummy-auxiliary

In the previous section, we concluded that Hedda produces more questions in English with non-inversion than questions where she inverts the main verb. In all of Hedda's eight questions with non-inversion, a dummy-auxiliary, whose only purpose is to check tense and agreement, is required in second position. It thus seems that *do*-support is what Hedda struggles the most with. In prediction 5, we predicted that Hedda would produce structures in which she omits the insertion of *do*, which we must now conclude to be borne out, albeit with small margins. In figures 7 and 8, we saw that Hedda produced a total of 19 questions where *do*-support was required. Out of these 19, ten were produced without the insertion of *do.*

As we have noted earlier in section 2.4.3, an unbalanced bilingual might be unable to enter a fully monolingual language mode in the weaker language. We also know from section 4.2, that Hedda virtually never finds herself in a fully monolingual English mode, and that her father is her primary source of input in English. Thus, from a generativist point of view (Pinker, 2015; Chomsky, 1956), one might argue that because Hedda receives so much more input in Norwegian compared to English, she has not yet acquired the aspect of *do*-support and that she has set the parameter for verb movement in English too wide, as all lexical verbs may be moved to second position in her dominant language. Furthermore, from this point of view, one is also forced to address the fact that there is considerable variety in her production where *do*-support is concerned, even if variation is very common in children's speech. This variation might indicate a learning curve, i.e. that Hedda is in the middle of the process of acquiring the aspect of *do*-support but has not yet fully acquired it. It is also possible that the questions she produces target-consistently are rote-learned, i.e. that they are imitations of questions found in her input, which would be the most likely explanation from a usage-based view of language acquisition.

As seen in chapter 2, a constructivist account of language acquisition argues that acquisition is considered to be the result of frequent attestation of certain word/phrase combinations in the input (Tomasello, 2015; Rowland & Pine, 2000; 2003; de Ruiter & Theakston, 2017). If this is the case, one would have to assume that every single target-consistent combination of

words/phrases uttered by the child must also be attested more or less frequently in the input. Westergaard (2009a) found that in the case of Adam, even combinations with a low frequency of attestation in the input were produced with the required inversion in more cases than without it. Thus, as a constructivist account of acquisition would predict that Adam would produce more utterances without the required inversion than with inversion, Westergaard (2009a) claims that a constructivist account fails to explain Adam's acquisition and output adequately.

Since we have not studied the input Hedda receives, it is hard to determine the frequency with which the different combinations of words/phrases are attested in her input, and based on the findings concerning the Norwegian children and Adam in Westergaard (2009a) it is possible that some combinations are not attested at all. After a quick search of Hedda's parents' utterances in the analysed data, we have found that at least some of the utterances Hedda makes are not attested. Examples of these can be seen in (41a-b). However, the analysed data represents only a fraction of the total input that Hedda receives, making it impossible to determine with any certainty whether the relevant utterances are evident in the input or not. Furthermore, this makes any claims as to whether Hedda has acquired these structures through use or by the setting of parameters, pure speculation.

(41) a. *Kan du spytte på mæ?* (Hedda, 2;9.1)
'Can you spit on me?'
b. Should we sail? (Hedda, 3;6.22)

Concerning Hedda's trouble with inserting *do* in the required structures, this might be considered natural as mostly all children acquiring English, as either an L1, L2, or through BFLA, have trouble with the use of *do* at some point during acquisition, as seen in section 2.5. However, even if both a constructivist approach and a generativist approach would have been able to predict this, we would like to suggest acquisition through micro-cues as an alternative explanation of Hedda's struggle with *do*-support. In section 2.2.2, we elaborated on Westergaard's (2009a) model of micro-cues. We would like to suggest that Hedda struggles with the use of *do* because of a possible misinterpretation of the micro-cues for word order in English questions, in that she fails to note that an auxiliary or the copula is required in second position even if neither is present in the initial structure.

7 Summary and conclusion

7.1 Summary

The main focus of this thesis has been to discover the nature with which one bilingual girl, Hedda, produces word order in English *yes/no* and *wh*-questions. Hedda shows a clear dominance in Norwegian, and thus the question of whether her dominant language affects her production of word order in English questions has been another main focus within the thesis. We have presented new data from a corpus where the data collection is still ongoing, and a discussion of Hedda's production word order in questions was carried out in light of the results. As Hedda shows a strong dominance in Norwegian, she makes for an interesting case study, in that a study of Hedda's acquisition may help us to better understand the implications language dominance has for children in a BFLA situation. In addition, we have compared Hedda to another Norwegian/English bilingual girl in similar circumstances, see Bentzen (2004), and to a monolingual English child, see Rowland & Pine, (2000), and Westergaard (2009a). This has helped us determine whether Hedda makes utterances that are typical of Norwegian/English bilinguals, or if the same types of utterances are evident in monolingual English-speaking children's speech as well.

Regarding the findings of this thesis, we have shown that Hedda mostly produces target-consistent *wh*- and *yes/no* questions with auxiliaries and the copula BE, in both Norwegian and English, and we have provided authentic examples of these from the data. The data further showed us that Hedda seems to struggle the most with the insertion of a dummy-auxiliary (*do*) where no other auxiliary nor the copula is present in the structure. This is evident in the data as structures lacking the insertion of *do*, structures lacking *do* where the main verb has been inverted, and one instance where *do* was used in a structure that did not require it, (30f). We have argued that some of these utterances might be viewed as a product of both facilitative and non-facilitative CLI from both standard Norwegian and the Tromsø dialect pertaining to Hedda's speech only, i.e. she does have knowledge of how to produce such structures in a target-consistent manner, but she sometimes fails to produce them in speech, presumably due to interference from her dominant language in parsing. Furthermore, we have argued that transfer in terms of economy is of some significance to Hedda's production of word order in English questions, as she produces fewer structures in which she moves the main verb than structures in which the main verb stays in situ and no functional element is added nor moved. The latter of these two has also been argued to be evidence of transfer from the Tromsø dialect.

We have also suggested that Hedda's trouble with inserting *do* in the structures requiring it, might be explained through a model of micro-cues. We further suggested that Hedda might have misinterpreted the micro-cues for word order in English question, and that said misinterpretation is manifested as a failure to note that an auxiliary or the copula is required in second position, even if neither is present in the initial structure.

7.2 Conclusion and suggestions for further research

In conclusion, we have found some evidence to suggest that Hedda's dominant language does affect the manner in which she produces word order in English questions, although the extent of this effect is hard to determine due to limited data where English questions are concerned. While the limited data make it hard to say with any certainty to what degree Hedda's dominant language affects her weaker language, it does indicate that there is an effect. Furthermore, this effect seems to be both beneficial and disadvantageous at the same time, in that it can both facilitate and impede acquisition. With this in mind, we would suggest that further study of unbalanced bilinguals can be advantageous with regards to understanding the challenges of bilingual first language acquisition. By studying several bilingual children, one might be able to get a clearer view of which particular elements of language are the most challenging to the bilingual learner.

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