

Language mixing and exoskeletal theory: A case study of word-internal mixing in American Norwegian

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Abstract

This paper discusses word-internal mixing in American Norwegian. The data show that the functional vocabulary is Norwegian whereas many of the lexical content items come from English. We argue that language mixing provides important evidence for grammatical theory: Specifically, the data support a late-insertion exoskeletal model of grammar like Distributed Morphology, in which the primitives of syntax are abstract feature bundles (morphemes) and bare roots. In such a theory, the structure is a separate entity, a sort of skeleton or frame, built of abstract morphemes. The phonological exponents of the roots and abstract morphemes are inserted late into designated slots. We show how such a model can explain the observed pattern for mixing within verb phrases and noun phrases in American Norwegian.

1. Introduction¹

Most work on formal syntax takes the following assumption as its point of departure:

Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance (Chomsky 1965: 3).

This assumption has been an eminent research strategy as it has made it easier to construct theories of complex empirical phenomena (Lohndal 2013). Given the vast number of theoretical and empirical questions that had to be addressed, the task would have been made much more difficult if more complex situations had been taken as the starting-point.

Today, the situation is different. It has been well established that formal grammars are a very good characterization of the nature of grammatical representations that humans possess. These formal grammars have mostly been constructed on the basis of monolingual data. Non-formal theories since the 1970s have studied what appears to be closer to “real life” situations, where one speaker knows multiple languages and mixes aspects of these languages to a greater or lesser extent. It is only in the past 25 years that a few formally-oriented linguists have started to focus on multilingual data, except for the more specialized area of second language acquisition.

The goal of this paper is to combine current developments in formal grammar with data from situations where two languages are mixed. We will argue that data from language mixing support a specific version of formal grammar, namely a late-insertion exoskeletal model. This theory has previously only been motivated on the basis of monolingual data, and being able to cover both monolingual and multilingual phenomena would significantly strengthen the model in question.

Specifically, this paper will focus on language mixing in the heritage language American Norwegian. This is the variety of Norwegian spoken by native speakers of Norwegian who immigrated to

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the US after the critical period (Lenneberg 1967) had passed, as well as their descendants.² The immigration period in question lasted for about a century, starting in the 1850's. They were gradually influenced by English (see Haugen 1953), and the resulting language mixing is characterized by Norwegian structure and functional items paired with certain English content words. The question is how to model this mixing in a way that predicts the possible and impossible patterns.

This paper is organized as follows. Section 2 introduces the empirical domain, American Norwegian, and some general issues when it comes to analyzing language mixing data. In section 3, we introduce and discuss our late-insertion exoskeletal model, and in section 4, we use this model to analyze mixing data from American Norwegian. Section 5 concludes the paper.

2. The empirical domain: American Norwegian

This section will present relevant background on language mixing (section 2.1) before introducing American Norwegian and some relevant constructions we will seek to analyze (section 2.2).

2.1. *The grammar of language mixing*

In the literature, there is a controversy regarding how to account for language mixing. In general, there are two positions: One that claims that language mixing requires additional theoretical primitives, and another one that claims that the same theory that accounts for monolingual data should account for language mixing as well.

One caveat is in order before we start. A lot of the literature we will rely on discusses code-switching specifically. Code-switching is but one instance of language mixing and there is substantial debate in the literature regarding whether or not certain types of mixing are to be considered code-switching or not. The debate is especially heated when it comes to distinguishing between code-switches and loanwords (Poplack 2004, Poplack and Dion 2012). It is straightforward to state that established loanwords are available for monolinguals as well as bilinguals, whereas you have to have some competence in an L2 in order to code-switch. What is not equally straightforward, is how – if at all – you can look at a single mixed item spoken by a bilingual and decide for certain whether you are dealing with a loan-word or an instance of code-switching. Some scholars argue that due to inappropriate methodology, attempts at distinguishing between the two must fail (Eliasson 1989, Eastman 1992, Johanson 1993, Thomason 2001, Winford 2003, Gardner-Chloros 2009). Others argue that the distinction is fuzzy or part of a continuum (Eliasson 1989, Heath 1989, Bentahila and Davies 1991, Boyd 1993, Myers-Scotton 1993, 2002, 2006, Field 2002, Boztepe 2003, Clyne 2003, Thomason 2003, Treffers-Daller 2005, Haspelmath 2009, Winford 2009).

In this paper, we are concerned with the formal grammar of cases where one language provides the inflectional morphemes and the word order, whereas the other language at most contributes some of the lexical content morphemes. This specific type of language mixing is by several researchers, e.g. Poplack and Dion (2012), considered to not be a form of code-switching. Poplack and Dion (2012) specifically claim that you can be certain you are not dealing with an instance of code-switching when coming upon what they call a lone other-language item, simply because such items never are code-switched. According to them, the process of code-switching only applies to multiword fragments, whereas lone other-language items always are borrowed; either for the nonce, something they dub *nonce borrowings*, or repeatedly, as established loanwords. They base this mostly on the observation that the integration of the single other-language items into the recipient-language occurs abruptly, whereas that is not the case for multiword fragments. By integration they mean the reproduction of variable recipient-language patterns. Within the model we propose here, however, the different level of integration observed between lone other-language

² Whether the first generation immigrants should be referred to as heritage speakers along with their descendants or not, is debatable (Áfarli 2015: 14-15). In either case, our dataset does not comprise speech from first generation immigrants.

items and multiword fragments is explained without assuming that they are subject to two different language mixing processes, such as borrowing and code-switching (more on that in section 2.2). Also, as pointed out by e.g., Myers-Scotton (1993) and Haspelmath (2009), the term *nonce borrowing* is straight out contradictory. Regardless of whether or not instances of code-switching can develop into loanwords over time, borrowings, as e.g., Haspelmath (2009) defines them, are completed processes of language change – in other words, by definition established. Mixing that happens for the nonce, however, would in the same theory be referred to as code-switches. Following such a distinction, what Poplack and Dion (2012) call nonce borrowings should really be seen as instances of code-switching. Haspelmath (2009) does acknowledge that one might broaden the definition of borrowing in such a way as to include what Poplack and Dion (2012) call nonce borrowing, but he stresses that he cannot see how they can do so without ending up with a definition of borrowing that encompasses all instances of code-switching – effectively making nonce borrowing the term for all types of code-switching. In other words, word-internal code-switching does exist, which means we need a model that can account for it.

If all established loanwords start out as code-switches, as e.g. Myers-Scotton (2002) has suggested, then even established loanwords have to be explained as if they were instances of code-switching; because diachronically, they once were. Even if it is correct, as e.g. Poplack and Dion (2012) claim, that established loanwords do not originate as code-switches, we still have to explain the word-internal language mixing that is the focus of this paper. Since we cannot easily assert whether a lone other-language item we encounter in the data is a loanword or an instance of code-switching, we run the risk of analyzing a specific lone other-language item as an instance of code-switching when in fact, it is an established loanword. However, since we can be certain that both established loanwords and code-switched lone other-language items exist, we know we need a model that can account for both. If we are dealing with an established loanword, it is essentially identical to be dealing with a completely monolingual utterance with no language mixing, meaning any syntactic model can account for it. If, on the other hand, a lone other-language item is an instance of code-switching, the list of syntactic models capable of accounting for it grows shorter. Since we cannot know whether our specific data are code-switches or loanwords, we set aside the discussion regarding labeling and continue to use the more general term language mixing throughout the paper.

We will now turn to another issue which is important for present purposes, namely whether language mixing phenomena require special grammatical principles or not. Myers-Scotton (1993, 2002) argues that it is impossible to explain language mixing phenomena without assuming an asymmetry between a matrix language and an embedded language (see also Joshi 1985, Jake, Myers-Scotton and Gross 2002).³ From this perspective, the notion of 'matrix language' and 'embedded language' are theoretical primitives. In any given utterance, the matrix language is the main language whereas the embedded language is a secondary language. This distinction is used to account for the fact that the matrix language enjoys a more privileged status: It is responsible for major word order phenomena and for providing the inflectional/functional morphemes, whereas the embedded language occasionally contributes lexical content items.

Another approach, which we can label the Null Theory account (Woolford 1983, Mahootian 1993, Belazi, Rubin and Toribio 1994, MacSwan 1999, 2000, 2005, Chan 2003, 2008, González-Vilbazo 2005, and González-Vilbazo and López 2011, 2012), argues that language mixing and un-mixed languages are governed by the same principles. That is, there are no constraints or rules that are unique to code-switching that cannot be found in the two individual grammars. Furthermore, there is just one computational system and this system does not recognize entities such as *matrix language* or *embedded language*. An advantage of this perspective is that language mixing is not something peripheral to the study of the language faculty, but rather, data from language mixing can inform the study of this faculty

³ The approach in Poplack (1980, 1981) and Sankoff and Poplack (1981) also proposes constraints that are unique to language mixing. See also Gumperz (1982).

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(cf. Chan 2008). However, González-Vilbazo and López (2011: 833) emphasize that the Null Theory assumption does not "necessarily entail that the I-language of code-switchers will be identical to the union of the two grammatical systems: code-switchers may include features drawn directly from Universal Grammar which are absent in the component grammars". We leave this issue open here, as our data do not provide evidence in either direction.

Several generative studies of language mixing have appeared, viz. Woolford (1983), Di Sciullo, Muysken and Singh (1986), Belazi, Rubin and Toribio (1994), Mahootian and Santorini (1996), MacSwan (1999, 2000, 2005), Muysken (2000), King (2000), Toribio (2001), Chan (2003, 2008), González-Vilbazo (2005), Adger (2006), van Gelderen and MacSwan (2008), González-Vilbazo and López (2011, 2012), and Áfarli and Subbarao (2013). In this paper, we will side with the scholars who have been arguing in favor of a Null Theory. However, we will also attempt at combining the Null Theory with an intuition found in Myers-Scotton's work, namely that of a matrix language (cf. Áfarli 2015). Although this may sound paradoxical, we will demonstrate that recent work in syntactic theory provides us with the tools to merge the Null Theory with insights in Myers-Scotton's work.

2.2. *Types of language mixing and American Norwegian*

In the literature, there is reference to roughly three main types of sociolinguistic settings of language contact and mixing, given in (1).

- (1) *Types of language mixing*
 - a. Balanced Bilingual Mixing (BBM)
 - b. Colonial Influx Mixing (CIM)
 - c. Immigrant Community Mixing (ICM)

(1a) is exemplified by children or adults who master (at least) two languages more or less fluently, and who mix those languages in their utterances (although possibly only in some situations). Speakers who exhibit (1a) are typically children who grow up as genuine bilinguals with parents who have different languages or where the parents speak one language at home and the child acquires another language outside its home. An example of (1a) is the speech of a bilingual Chinese child growing up in Norway, who masters both Mandarin Chinese and Norwegian, reported in Áfarli and Jin (2014). (2a) is an example produced by this child, in which Chinese is the main language and Norwegian is the secondary one. The mixed verb phrase in (2a) has Chinese word order and Chinese grammatical properties. (2b) provides the Norwegian translation, and as can be seen, 'ball' would have had a suffix denoting definiteness, gender and number in Norwegian. In the Chinese-Norwegian sentence, however, there is no suffix, in accordance with Chinese grammar. Note that throughout this paper, we will only gloss the examples with features relevant to the point being made, for ease of exposition.

- (2)
 - a. Da na ge ball Chinese-Norwegian
hit that GE ball
'Hit that ball.'
 - b. Slå den ballen Norwegian
hit that ball._{DEF.M.SG}
'Hit that ball.'

Type (1b) is exemplified by situations where the language of a minority colonial master, due to its status and power, influences the majority native language(s) of the colonized people. This is the typical situation during the long period of western colonization of large parts of the world during the last 500 years. The influence of English and French on many native languages of Africa can serve as an example; cf. Myers-Scotton (1993) and Kamwangamalu (1997). Examples of (1b) are provided e.g. by Zulu – English mixing (data from Kamwangamalu 1997: 47). Zulu is the main language and English is the secondary language.

Clauses with object pronouns show OV order in Zulu, but regular VO order in English. The mixed example in (3) has the Zulu OV order, and inflectional affixes are also from Zulu.

- (3) No mngame zama uku-**ba-respect**-a Zulu-English
no my friend try to them respect
 ‘No my friend, try to respect them.’

Type (1c) is exemplified by situations where a group of people from one language community settles on the native soil of another and larger, more powerful language community, and where the language of the members of the immigrant minority community is influenced by the dominating majority language. The empirical basis of this paper will consist of exactly this situation, namely American Norwegian. As previously stated, this is the variety spoken by Norwegian immigrants who settled in the USA during a hundred years’ period starting from the first half of the 19th century, as well as their descendants. A lot of material was collected by Einar Haugen in the 1930’s (see Haugen 1953) and Arnstein Hjelde in the 1980’s (Hjelde 1992). Currently, however, an electronic database called *Corpus of American Norwegian Speech* (CANS) is being created at the Text Laboratory at the University of Oslo, including material that has been collected in recent times. It is this newer material that our data come from. This corpus is a rich source of American Norwegian mixing data that is excellent for our purposes. First, it comprises data collected in recent years and therefore contains considerably more instances of language mixing as compared to the earlier data, as the speakers are being ever more influenced by English. Moreover, it contains sound and video files together with transcriptions, which enables us to actually listen to the pronunciation of the inserted English item to determine whether it has a full-fledged American accent or not.

In American Norwegian, Norwegian is the main language and English is the secondary language. Norwegian is a Verb Second (V2) language, whereas English is not. As expected, American Norwegian clauses show V2, as shown in (6). In addition, tense affixes are Norwegian and noun phrases exhibit Norwegian syntax and affixes, even when the lexical content morphemes are borrowed from English. This is shown in (4)-(6). We have altered the transcriptions and used English spelling for English words. These are marked as bold, and importantly, they were uttered with a distinct American accent as opposed to a Norwegian one. The information in brackets behind each American Norwegian example is a reference to the speaker in the CANS corpus who uttered that specific phrase.

- (4)
- a. Jeg **teach**-a # første # **grad**[e]-en American Norwegian
I teach-PAST # first # grade-DEF.M.SG-
 ‘I taught the first grade.’ (coon_valley_WI_07gk)
- b. Jeg underviste den første klassen Norwegian
I teach-PAST the_M first grade-DEF.M.SG
 ‘I taught the first grade.’
- (5)
- a. Å **celebrat**[e]-e **birthday**-en hennes American Norwegian
to celebrate-INF birthday-DEF.M.SG hers
 ‘To celebrate her birthday.’ (coon_valley_WI_06gm)
- b. Å feire bursdagen hennes Norwegian
to celebrate-INF birthday-DEF.M.SG hers
 ‘To celebrate her birthday.’
- (6)
- a. Så kan du **mow**[e]-e litt **lawn** American Norwegian
then can you mowe-INF some lawn-INDEF.SG
 ‘Then you can mowe some lawn.’ (coon_valley_WI_07gk)

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- b. Så kan du klippe litt plen Norwegian
then can you cut_{-INF} some lawn_{-INDEF.SG}
 ‘Then you can mowe some lawn.’

As shown in the examples above, the English verbs *teach*, *celebrate* and *mowe* have all received Norwegian affixes. Note that the Norwegian translation of *teach*, ‘undervise’, receives the inflectional affix –te in past tense, not the –a used on the mixed verb in the American Norwegian clause. These are both past tense suffixes used in Norwegian, however, and there might well be phonological reasons for why the speaker chose *teach-a* over *teach-te*. Similarly, the English nouns *grade*, *birthday* and *lawn* are all marked for definiteness/indefiniteness, and the noun phrases show Norwegian syntax. We will return to this in section 4.

The overall pattern that emerges from these three types of language contact and mixing is the following: In situations of language mixing, one of the languages involved is the main language while the other is the secondary language. The main language provides the overall grammatical structure of the utterances (e.g. as expressed through word order), as well as most of the lexical content morphemes and all the inflectional/functional morphemes. The secondary (or influencing) language occasionally provides lexical content morphemes, but not inflectional or functional morphemes. We can display the pattern as in (7).⁴

- (7)
- | | | | | |
|----|--------------------|---|----------------------|---------------------------------|
| a. | L _{SEC} | + | INFL _{MAIN} | |
| b. | L _{MAIN} | + | INFL _{MAIN} | |
| c. | *L _{SEC} | + | INFL _{SEC} | (except in bigger mixed chunks) |
| d. | *L _{MAIN} | + | INFL _{SEC} | |

It is worth pausing at the exception in (7c) above, namely that you do find lexical content morphemes from the secondary language with inflectional morphemes also from the secondary language in bigger mixed chunks. (8) and (9) are examples of this.

- (8)
- | | | | |
|----|---|--------------------------------|--------------------|
| a. | Åssen det var der | in the second world war | American Norwegian |
| | <u>how it was there in the</u> | <u>second world war</u> | (westby_WI_03gk) |
| | ‘How it was there in the second world war.’ | | |
| b. | Åssen det var der i den | andre verdenskrigen | Norwegian |
| | <u>how it was there in the</u> | <u>second worldwar</u> | |
| | ‘How it was there in the second world war.’ | | |

- (9)
- | | | | | |
|----|---|------------------------------|---------------------------------|--------------------|
| a. | Første fisken | vi | caught down in the creek | American Norwegian |
| | <u>first fish</u> | <u>we caught down in the</u> | <u>creek</u> | (westby_WI_03gk) |
| | ‘The first fish we caught down in the creek.’ | | | |
| b. | Den | første fisken | vi tok nede i bekken | Norwegian |
| | <u>the</u> | <u>first fish</u> | <u>we caught down in creek</u> | |
| | ‘The first fish we # e # caught e # down in the creek.’ | | | |

In (8), the entire PP *in the second world war* is in English, displaying English functional elements and lacking the Norwegian definiteness suffix –en. In (9), the entire VP *caught down the creek* is in English;

⁴ There are exceptions to this pattern, such as the occasional use of the English plural marker –s in an otherwise Norwegian noun phrase, as well as English nouns in an otherwise Norwegian, definite noun phrase lacking the Norwegian definiteness suffix. As this barely ever occurs in the earlier material documented in Haugen (1953), we are for the most part attributing this to attrition. An analysis of this phenomenon can be found in Riksem (2015) and Riksem et al (2014).

and in addition to the English functional elements we find, neither the verb nor the noun displays Norwegian suffixes for tense and definiteness, respectively. This is perfectly in accord with the model we will propose, as it only requires the overall mixed phrase, not the internal structure of the phrase, to fit with the Norwegian structure. In other words, the model requires the PP in (8) and the VP in (9) to appear in positions where a Norwegian PP and VP could have appeared, but the internal structure of these phrases may very well be English. In other words, the observed integration discrepancy between single, other-language items and multiword fragments reported in Poplack and Dion (2012) follows naturally from the model, leaving us with no reason to assume that they are subject to two different mixing processes.

Leaving the bigger mixed chunks aside and coming back to the pattern for word-internal mixing, we will look at American Norwegian and provide an account of why (7c) and (7d) do not exist.

3. A late-insertion exoskeletal model

In this section, we will outline a new approach to grammar, namely a *late-insertion exoskeletal model*. This model will combine work on argument structure with work on the relationship between syntax, morphology, and phonology. In section 3.1, we briefly review the main transition from theta roles to structural constraints on argument structure. Section 3.2 proposes a specific model of language mixing, which we use to analyze data from American Norwegian in section 4.

3.1. Advances in our understanding of argument structure

It is commonly argued that e.g., verbs carry information about its surrounding syntactic structure. This is illustrated in (10)-(11), where each verb contains information about its number of arguments (subject, object, etc.). Underlining of the number denotes the subject.

(10)

- a. John kicked the ball.
- b. *John kicked → kick: 1, 2

(11)

- a. Kim gave Michael candy.
- b. *Kim gave Michael. → give: 1, 2, 3

This information is typically known as *theta roles* (Chomsky 1981), or thematic roles (Gruber 1965, Jackendoff 1990, Carlson 1984). The assumption is that theta roles account for syntactic constraints on argument structure.

Since Chomsky (1995), Harley (1995) and Kratzer (1996), many scholars have argued that the Agent is introduced by a dedicated functional projection, VoiceP or vP (Alexiadou, Anagnostopoulou and Schäfer 2006, Folli and Harley 2007, Merchant 2013), distinguishing between the external argument and all the internal arguments (Williams 1981, Marantz 1984). Since then, other work has argued that all arguments are introduced by dedicated projections (Borer 2005a, b, 2013, Ramchand 2008, Bowers 2010, Lohndal 2012, 2014).

In this paper, we will assume that instead of encoding properties of syntactic structures into the words themselves, the syntactic structures are generated independently of the words. This is inspired by non-generative construction grammar work, as witnessed e.g., in Goldberg (1995, 2006) (and see Booij 2010 for morphology). A series of scholars have worked on developing a generative neo-constructivist model, e.g., van Hout (1996), Borer (2005a, b, 2013), Åfarli (2007), Ramchand (2008), Lohndal (2012, 2014) and Marantz (1997, 2013), to mention some. The most “radical” approach can be called exoskeletal, as the syntactic structure is assumed to provide a *skeleton* (Borer: *template*; Åfarli: *frame*) in which lexical items can be inserted, much like in Chomsky (1957) and in *Distributed Morphology*

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(Embick and Noyer 2007). Of the researchers mentioned above in favor of a generative neo-constructivist model, both Borer, Marantz, Áfarli and Lohndal support an exoskeletal view. Let us briefly review two arguments in favor of an exoskeletal model.

The first involves the variability that verbs display. Many verbs can occur in a range of sentential environments, viz. the examples in (12) from Clark and Clark (1979).

(12)

- a. The factory horns sired throughout the raid.
- b. The factory horns sired midday and everyone broke for lunch.
- c. The police car sired the Porsche to a stop.
- d. The police car sired up to the accident site.
- e. The police car sired the daylight out of me.

It is natural to assume that even native speakers of English who have never heard *siren* used as a verb easily can interpret these sentences. The examples show that *siren* can appear with a varying number of arguments, and that the core meaning (to produce a siren sound) seems to be maintained in all cases, even though the specific meanings are augmented according to the syntactic environment. This strongly suggests that the meaning of *siren* cannot just come from the verb itself, but that it depends on the meaning of the syntactic construction. This is more in accord with an exoskeletal model than the mainstream, endoskeletal one, where syntax is generated on the basis of features inherent to lexical heads (e.g. verbs).

Another supporting argument for the exoskeletal view is the flexibility many lexical items display as to what word class they belong to. One example is provided in (13).

(13)

- a. He ran *out* the door.
- b. My son *outed* me to his preschool.
- c. He was desperately looking for an *out*.

In (13), *out* surfaces as a preposition (a), a verb (b) and a noun (c). In an endoskeletal model of the grammar where features inherent to a lexical head determine, amongst other things, what word class category it belongs to, there are two options for accommodating (13). *Out* either has to be stored in the lexicon as both a preposition, a verb and a noun, or alternatively, one has to assume that one word class is derived from the other. Both solutions are circular, and therefore not explanatory: they do not capture the systematic relation between the different versions of *out*, meaning the verb *out* and the noun *out* are no more related in the grammar than, say, the verb *out* and the noun *sofa*. An exoskeletal theory fares better, in that one assumes a category-less primitive, usually referred to as root, receives a specific word class category (noun, verb, ...) by virtue of being inserted into a particular syntactic position in a template/frame.

For reasons of space, we cannot review other arguments in favor of an exoskeletal view, but we refer to extensive discussions in the literature, cf. Parsons (1990), Schein (1993), Kratzer (1996), van Hout (1996), Borer (2005a, b, 2013), Levin and Rappaport Hovav (2005), Alexiadou et al. (2006), Pietroski (2007), Ramchand (2008), Lohndal (2012, 2014), Adger (2013). It is important to emphasize that exoskeletal theories cover a *family of approaches*. The works we cite here differ in details, but they share the claim that syntactic structure is crucial in determining argument structure, a view that has gained traction in recent years. This is clearly conveyed in the following quote from Marantz (2013: 153) where he says that current developments in linguistic theory

“... have shifted discussion away from verb classes and verb-centered argument structure to the detailed analysis of the way that structure is used to convey meaning in language, with verbs being integrated into the structure/meaning relations by contributing semantic content, mainly associated with their roots, to subparts of a structured meaning representation.”

This is in contrast to what has become a hallmark of much work within the Minimalist Program (Chomsky 1995), namely its lexical nature: syntactic structure is generated based on features on lexical and functional elements (see Adger 2003 for a textbook illustration where this is pursued in great detail, see also Adger 2010 and Adger and Svenonius 2011). This feature-based approach has also been applied to intra-individual variation; see especially MacSwan (1999, 2000), King (2000), and Adger (2006).

However, features are not unproblematic. Let us briefly consider some issues that emerge. The first is that it is unclear what the nature of features is (see Chomsky 1995, Brody 1997, Pesetsky and Torrego 2004, Zeijlstra 2008, 2012, Adger 2010, Boeckx 2010, Adger and Svenonius 2011 for discussion). What kind of features are there? Are they binary, privative? Are features the only building blocks in syntax? Despite a lot of work on features, there is no consensus on these issues. Another issue is that several of the syntactic features that are invoked appear to be rather pragmatic, semantic or phonological in nature. This seems to be true of features such as [TOPIC] and [FOCUS] and EPP-features triggering movement if there is a semantic effect of the movement (Reinhart 1997, Fox 1995, Chomsky 2001). If the features have a pragmatic, semantic or phonological basis, one could argue that rather than syntacticizing such features, the relevant effects should be analyzed in these components in order to avoid duplicating the analysis across grammatical components (Borer 2005a, b, 2013).

An important tenet of features in the Minimalist Program was to constrain derivations. Taken to its most radical conclusion, it means that grammar is "crash-proof" (Frampton and Gutmann 2002) in the sense that only grammatical structures are licit at the interface. If features do not constrain derivations, there have to be other ways of "filtering" out illicit representations. These can be derivational constraints like Relativized Minimality (Rizzi 1990, 2001, Starke 2001, etc.), or they can be interface constraints that are either phonological or semantic. In order to account for argument structure violations, the exoskeletal view typically relies on an interface account: A combination of language use and conceptual knowledge account for the absence of certain meanings (Borer 2005a, b, Åfarli 2007, Nygård 2013, Lohndal 2014). In this sense, the theory is more like Government and Binding (Chomsky and Lasnik 1977, Chomsky 1981, Lasnik and Saito 1984, 1992) than most approaches within the Minimalist Program.

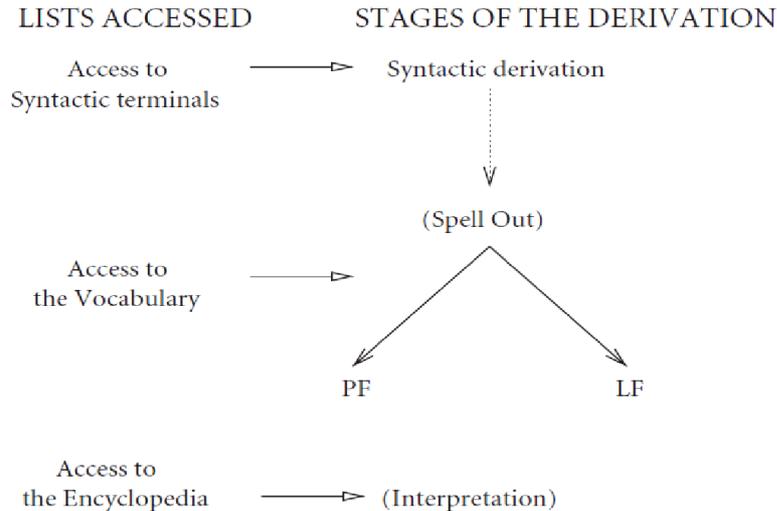
In the exoskeletal model that we will be developing in the next section, the role of features in syntactic derivations is restricted to formal morphological features of functional nodes, and we thus assume that it is desirable to adopt a restrictive view on the role played by features in a derivation. Instead, syntactic templates or frames take on an important role. Importantly, syntactic structures will contain features, but the role played by feature matrices is different regarding functional elements as compared to lexical content items. Put differently, we assume that the abstract building blocks of syntactic structures are functional features and functional feature matrices, but we will assume that the functional elements instantiate feature matrices, whereas lexical content items are freely inserted into designated lexical slots.

3.2. *A specific model of language mixing*

We will assume an exoskeletal model, which is a version of Distributed Morphology (DM) (Halle and Marantz 1993, Marantz 1997, Harley and Noyer 1999, Embick and Noyer 2007). Rather than assuming one lexicon one can access at the very beginning of the syntactic derivation, DM has distributed the content of the lexicon throughout the derivation, comprising three separate lists. This is illustrated in (14).

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(14) *The Grammar (Embick & Noyer 2007: 301)*



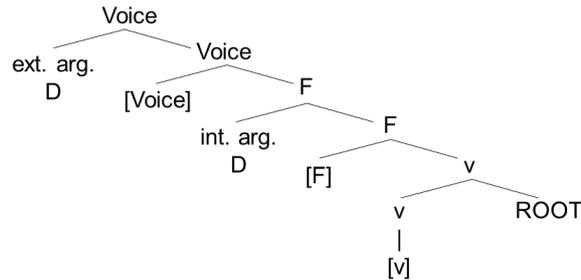
The syntactic terminals consists of two types of primitives, namely roots and features or feature bundles. Roots are items like $\sqrt{\text{TABLE}}$, $\sqrt{\text{CAT}}$ or $\sqrt{\text{WALK}}$. There is a discussion amongst the proponents of exoskeletal models as to what the nature of roots are (see for instance Harley 2014 and subsequent articles in the same issue of *Theoretical Linguistics*). We will assume that roots are devoid of grammatical features and that they are underspecified for phonology and semantics, following Arad (2005); but the exact nature of roots is not of vital importance to this article. What is important is that we assume that all roots one individual has ever learned, whether that speaker is monolingual or multilingual, are stored together. In other words, roots do not belong to any particular language in the sense of being listed separately or having any sort of language features; rather, knowledge of what language a specific root usually appears in is stored in the Encyclopedia, along with other idiosyncratic and idiomatic pieces of information.

Unlike the roots, we assume that the features and feature bundles, known collectively in the DM literature as *abstract morphemes*, are stored in language-specific lists. This means that someone competent in two languages or varieties will have one list for the abstract morphemes of the one language or variety, another list for those belonging to the other, and a third list encompassing all the roots. Importantly, the features that make up the abstract morphemes are drawn from a universal repository; and part of learning a language or variety is learning which features that are “active” in that specific language, as well as how they bundle together, and then storing that information as specific abstract morphemes. Thus, if Norwegian makes use of the feature bundle [+X, +Y, +Z], and a particular speaker of Norwegian also speaks another language or variety which makes use of the exact same feature bundle, the same bundle will be stored in both lists of abstract morphemes. Roots, however, are not universal, and we can therefore always add new ones – there is no final list. This distinction between abstract morphemes and roots reflects the classic division between open and closed class items.

There are two options for the generation of syntactic structures (templates/frames). Either they are generated by the functional features, or alternatively Merge operates freely (Chomsky 2004, Boeckx 2014). We will not take a stand regarding this particular question. Rather, we want to look into the consequences for language mixing of a model such as the one proposed here, where abstract syntactic

frames or templates are generated prior to any lexical insertion. Let us look at an abstract and simplified representation of the argument structure domain of a clause. [] denotes a feature matrix.

(15)



This structure builds on Lohndal (2012, 2014), where the abstract verb slot is generated prior to functional structure introducing arguments. Both the internal and the external arguments are introduced into the structure by way of dedicated functional projections. Other structures such as Borer (2005a, b), Ramchand (2008), Bowers (2010) or Alexiadou, Anagnostopoulou and Schäfer (2015) are also compatible with what follows, we are simply using (15) for ease of exposition.

We will follow DM in assuming that both roots and abstract morphemes are abstract units, which do not get their phonological content until after Spell-Out to the interfaces. Another way of putting it is to say that the exponents of all lexical material (in the wide sense, comprising both functional and content items) are inserted late. This process is known in DM as *Vocabulary insertion*. The Vocabulary is the second type of list assumed in DM, and consists of the phonological exponents of the different roots and abstract morphemes, also known as *Vocabulary Items* (VI). This process will prove important when we account for the word-internal cases of language mixing in section 4. Another thing that naturally follows from DM, is that syntax operates word-internally as well. By making this assumption, we make it easy for the theory to address word-internal language mixing, pace e.g. MacSwan (1999, 2000) and King (2000). In fact, it is impossible to prevent the theory from saying something about word-internal mixing.

The resulting picture is one in which we get an abstract syntactic structure where the exponents of roots and abstract morphemes can be inserted. Root insertion is without any syntactic constraints, as the syntactic slots in which roots are inserted make no featural demands regarding their content. This explains why we can get the pattern in (7a), repeated underneath as (16a).

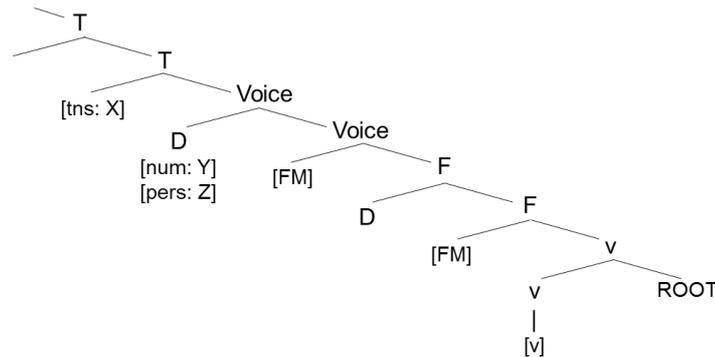
(16)

- | | | | | |
|----|--------------------|---|-----------------------------|---------------------------------|
| a. | L_{SEC} | + | $\text{INFL}_{\text{MAIN}}$ | |
| b. | L_{MAIN} | + | $\text{INFL}_{\text{MAIN}}$ | |
| c. | $*L_{\text{SEC}}$ | + | INFL_{SEC} | (except in bigger mixed chunks) |
| d. | $*L_{\text{MAIN}}$ | + | INFL_{SEC} | |

As seen in (16c) and (16d), however, the exponents of abstract functional morphemes apparently always come from the main language, never from the secondary one. In the present context of American Norwegian, this amounts to saying that the functional vocabulary comes from Norwegian and not from English. This asymmetry needs an explanation, and this is where features really play a role in this model. We assume that the main or matrix language builds the structure, and thus that the feature matrices that are part of the structure come from the Norwegian list of abstract morphemes. As mentioned, roots do not instantiate feature matrices, but are rather inserted as modifiers in the appropriate lexical slots. Abstractly, this can be illustrated as in (17).

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(17)



In (17), we have specified the feature matrices relevant to our illustration of language mixing, leaving the others as [FM] (for feature matrix) for ease of exposition. The functional exponent that will be subject to vocabulary insertion in any particular one of those slots has to match the features of the underlying abstract morpheme. This follows from the rules of exponence summarized in the *Subset Principle* (Halle 1997), which reads as follows:

Subset Principle: The phonological exponent of a Vocabulary Item is inserted into a position if the item matches all or a subset of the features specified in that position. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions of insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

What also follows from this particular formulation of the Subset Principle is that the most specified form will block the insertion of a less specified form, even though they both are compatible. This specification will prove important when addressing verbal word-internal language mixing in section 4.

For the lexical categories, items can be inserted from any language. We have specified in the structure where you would get a root and where you would get a full nominal phrase, D (the internal structure of which we will get back to). At least for English-Norwegian mixing, we assume that roots never are mixed on their own. The smallest element that is mixed, at least in English-Norwegian mixing, is a categorizing stem. In other words, the categorizing head has to come from the same language as the root. We can assume this because of data such as (18), based on intuitions from several native speakers of Norwegian.

(18)

- a. Han sprang *ut* døra
he ran out door-DEF.F.SG
 ‘He ran *out* the door.’
- b. Sønnen min *out-a/*ut-a* meg til førskolen sin
son-DEF.M.SG my out-PAST out-PAST me to preschool-DEF.M.SG his
 ‘My son *outed* me to his preschool.’

We see that the Norwegian preposition *ut* roughly corresponds to the English preposition *out*, but whereas *out* can surface as a verb in English, *ut* is not attested in similar use in Norwegian. What is attested, however, is the verb *out* being used as a verb in Norwegian, as seen in (18b). If what was mixed into Norwegian were the uncategorized root, we would not expect *outa* in Norwegian to have the exact same idiosyncratic meaning as *outed* has in English, simply because that specific, verbal meaning is not present in the meaning content of the preposition, adverb, noun or adjective built using the same root. In other

words, Norwegian must have mixed in a structure involving at least the categorized root for the specialized verbal meaning of *out* to be attained as well.

This outlines the model we will be using, and we now turn to word-internal language mixing and how this specific model can account for the pattern we observe in American Norwegian.

4. Accounting for word-internal mixing

Let us consider how we can employ the model developed in section 3 to analyze more data from American Norwegian. We will first look at verbs and then at nouns.

The examples in (19) illustrate word-internal mixing within verbs. As in the previous examples, the index in brackets behind each example is a reference to the speaker in the CANS corpus who uttered that specific phrase. Again, CANS' transcriptions have been altered for ease of exposition: English words are here written using English spelling. This will be the norm for all subsequent examples.

(19)

- | | |
|--|------------------------|
| a. spend -e | (blair_WI_02gm) |
| <u>spend</u> _{-INF} | |
| 'to spend' | |
| b. bother -e | (westby_WI_01gm) |
| <u>bother</u> _{-INF} | |
| 'to bother' | |
| c. figur[e] -e ut | (blair_WI_01gm) |
| <u>figure</u> _{-INF} <u>out</u> | |
| 'to figure out' | |
| d. harvest -e | (coon_valley_WI_02gm) |
| <u>harvest</u> _{-INF} | |
| 'to harvest' | |
| e. cultivat[e] -e | (coon_valley_WI_04gm) |
| <u>cultivate</u> _{-INF} | |
| 'to cultivate' | |
| f. shut -e | (coon_valley_WI_04gm) |
| <u>shut</u> _{-INF} | |
| 'to shut' | |
| g. count -e | (sunburg_MN_03gm) |
| <u>count</u> _{-INF} | |
| 'to count' | |
| h. rais[e] -er | (blair_WI_01gm) |
| <u>raise</u> _{-PRES} | |
| 'raise(s)' | |
| i. rent -er | (coon_valley_WI_02gm) |
| <u>rent</u> _{-PRES} | |
| 'rent(s)' | |
| j. pre-empt -er | (harmony_MN_01gk) |
| <u>pre-empt</u> _{-PRES} | |
| 'pre-empt(s)' | |
| k. hunt -er | (coon_valley_WI_04gm) |
| <u>hunt</u> _{-PRES} | |
| 'hunt(s)' | |
| l. feed -er | (spring_grove_MN_05gm) |
| <u>feed</u> _{-PRES} | |

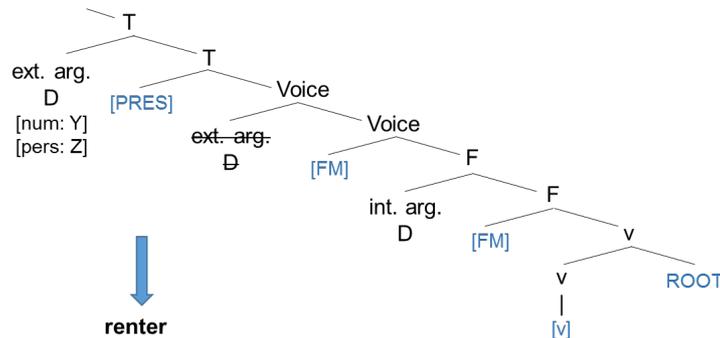
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- | | | |
|----|------------------------|-----------------------|
| | ‘feed(s)’ | |
| m. | retir[e]-a | (coon_valley_WI_06gm) |
| | <u>retire</u> -PAST | |
| | ‘retired’ | |
| n. | visit-a | (blair_WI_01gm) |
| | <u>visit</u> -PAST | |
| | ‘visited’ | |
| o. | telephon[e]-a | (harmony_MN_01gk) |
| | <u>telephone</u> -PAST | |
| | ‘telephoned’ | |
| p. | car[e]-a | (webster_SD_02gm) |
| | <u>care</u> -PAST | |
| | ‘cared’ | |
| q. | tight-a | (westby_WI_01gm) |
| | <u>tight</u> -PAST | |
| | ‘tighted’ | |
| r. | catch-a | (sunburg_MN_03gm) |
| | <u>catch</u> -PAST | |
| | ‘caught’ | |
| s. | watch-a | (sunburg_MN_03gm) |
| | <u>watch</u> -PAST | |
| | ‘watched’ | |
| t. | walk-te | (rushford_MN_01gm) |
| | <u>walk</u> -PAST | |
| | ‘walked’ | |
| u. | rais[e]-te | (blair_WI_01gm) |
| | <u>raise</u> -PAST | |
| | ‘raised’ | |

As illustrated, even though an English stem is used in the American Norwegian examples, the affixes are not English, but rather the ones used in Norwegian. How can we account for this?

A structure for the example in (19i), *renter*, will be as in (20), where the vocabulary item or exponent has been inserted to make it easier to read the structure. In the syntax, importantly, there are only feature matrices and roots. Note that only the relevant features are shown.

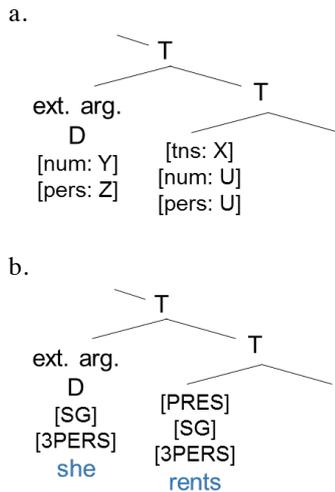
(20)



The verb moves from stem position/v through F and Voice until it picks up the inflectional morpheme in T. Not included here is that together, the verb and the inflectional ending would then move to C, since American Norwegian conforms to the V2 rule.

Importantly, the exponent is *renter*, with a Norwegian tense inflection, not *rent* or *rents*, with an English one. In order to explain why this is a pattern we observe for all mixed verbs in American Norwegian as opposed to a random coincidence, we have to look at the corresponding English structure. (21a) shows the relevant abstract structure with feature matrices, whereas in (21b), we have inserted exponents.

(21)



As we see, the English structure is identical to the Norwegian one, apart from the fact that the English T has unvalued features for number and person that have to be valued by features of the external argument. When the external argument has the features [num: SG, pers: 3], as in (21b), the exponent of T is *rents* with an –s. Had the external argument had any other feature combination, however, the exponent would have been *rent*. In other words, English has subject-verb agreement. As we recall from the abstract, Norwegian structure in (17), we do not assume that the feature matrix of T used in Norwegian includes unvalued features for number and person, simply because Norwegian does not display subject-verb agreement. This means that following the Subset Principle, both Norwegian *renter*, English *rent* and English *rents* are exponents compatible with the feature matrix of the Norwegian T; but since the Norwegian exponent is a better match, seeing as it is the exponent of the exact feature matrix called for, it blocks the use of the English ones.

It is worth noting that one also could assume that *all* languages have subject-verb agreement, but that some languages, such as Norwegian, have identical exponents for all feature combinations. If that were the case, the Norwegian and English exponents would be equally well-matched, meaning the syntax would pose no restrictions for the insertion of any of them. We claim that even in such situations, we can expect the exponent from the matrix language to be chosen over that from the embedded language. The reason is that the speaker is aware of what language constitutes the main language of any given utterance. When building an American Norwegian syntactic structure, for instance, the speaker gets his or her abstract morphemes from the Norwegian list of abstract morphemes; and that will likely influence what exponent they will choose to use, even if there was an identical abstract morpheme in the American list. We do not even have to get very technical, as this really is a matter of communication strategies. If I am speaking a specific language or variety, say, Norwegian, I am likely to make use of mostly Norwegian exponents for both abstract morphemes and roots. If I choose to use an exponent associated with a different language instead of a Norwegian one, it will not just be because they both were compatible and I randomly chose one; I will be choosing that exponent for some form of purpose. In the case of categorized roots, there are many reasons why one might want to choose one from another language. It

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could be that the matrix language does not have an exponent with the specific semantic content the speaker wants to express, as the case is with the verb *out*; or there could be other psychosocial reasons (e.g., Poplack and Dion 2012 mention conspicuousness and attention-seeking as to oft-cited motivations). It is more difficult to see what the motivation for choosing a functional exponent from another language could be, though.

Now, let us turn to word-internal mixing within nouns.

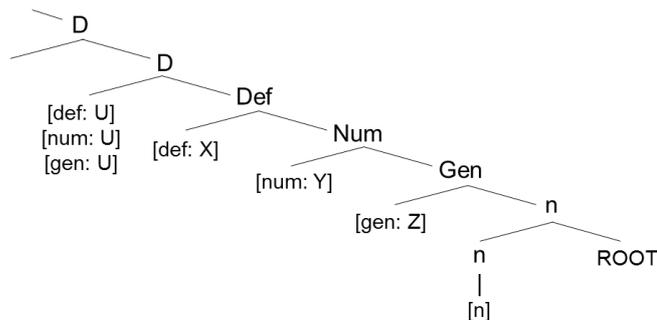
(22)

- | | |
|---|-----------------------|
| a. road -en
<u>road</u> _{DEF.M.SG}
'the road' | (westby_WI_02gm) |
| b. graveyard -en
<u>graveyard</u> _{DEF.M.SG}
'the graveyard' | (blair_WI_07gm) |
| c. river -en
<u>river</u> _{DEF.M.SG}
'the river' | (chicago_IL_01gk) |
| d. teacher -en
<u>teacher</u> _{DEF.M.SG}
'the teacher' | (rushford_MN_01gm) |
| e. end loader -en
<u>end loader</u> _{DEF.M.SG}
'the end loader' | (westby_WI_01gm) |
| f. track -en
<u>track</u> _{DEF.M.SG}
'the track' | (coon_valley_WI_04gm) |
| g. squirrel -en
<u>squirrel</u> _{DEF.M.SG}
'the squirrel' | (coon_valley_WI_02gm) |
| h. railroad -en
<u>railroad</u> _{DEF.M.SG}
'the railroad' | (harmony_MN_05gm) |
| i. university -en
<u>university</u> _{DEF.M.SG}
'the university' | (harmony_MN_04gm) |
| j. color -en
<u>color</u> _{DEF.M.SG}
'the color' | (coon_valley_WI_04gm) |
| k. choir -en
<u>choir</u> _{DEF.M.SG}
'the choir' | (coon_valley_WI_07gk) |
| l. cousin -a
<u>cousin</u> _{DEF.F.PL}
'the cousin' | (harmony_MN_01gk) |
| m. fair -a
<u>fair</u> _{DEF.F.SG}
'the fair' | (coon_valley_WI_06gm) |
| n. field -a
<u>field</u> _{DEF.F.SG}
'the field' | (westby_WI_02gm) |

- | | |
|--|-----------------------|
| o. field -et
<u>field</u> _{DEF.N.SG.}
'the field' | (rushford_MN_01gm) |
| p. pastur[e] -et
<u>pasture</u> _{DEF.N.SG.}
'the pasture' | (coon_valley_WI_03gm) |
| q. government -et
<u>government</u> _{DEF.N.SG.}
'the government' | (harmony_MN_01gk) |
| r. shed -et
<u>shed</u> _{DEF.N.SG.}
'the shed' | (blair_WI_07gm) |
| s. school board -et
<u>school board</u> _{DEF.N.SG.}
'the school board' | (westby_WI_01gm) |
| t. stor[e] -et
<u>store</u> _{DEF.N.SG.}
'the store' | (wanamingo_MN_04gk) |
| u. fenc[e] -a
<u>fence</u> _{DEF.N.PL}
'the fences' | (coon_valley_WI_06gm) |

As can be seen, even though an English stem is used in the American Norwegian examples, the definiteness morpheme is not the English prenominal free morpheme *the*, but rather the Norwegian postnominal suffix. Just like in the case of the verbal examples above, our model readily explains this pattern. Since American Norwegian is a variety of Norwegian, the speaker employs a Norwegian syntactic structure; and the relevant Norwegian syntactic structure is sketched in (23) (cf. Riksem et al 2014).

(23)



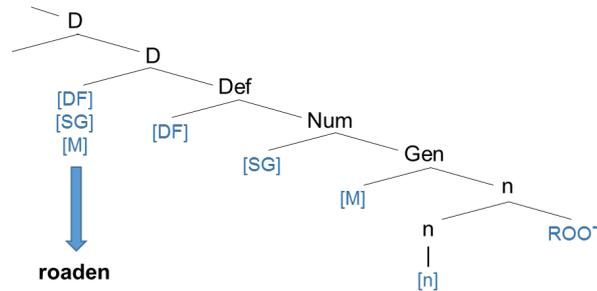
The structure builds on Julien (2005), with the exception of the gender projection. Whereas Julien argues that gender lacks a projection of its own and rather is a feature of the root or stem, we will assume that it is an independent functional head, cf. Picallo (1991, 2008) (though see Alexiadou 2004 and Kramer 2014 for a different analysis). Note that our data also are consistent with an analysis where gender is a feature of another syntactic head instead of being a projecting head itself. Definiteness, number and gender could for instance be features of the same functional head, as argued for in Riksem (2015). This is also compatible with the gender feature being located on different syntactic heads in different languages, as proposed in Ritter (1993). For the purposes of this paper, however, we will use GenP to implement our

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analysis. What we will argue not to be compatible with our data is gender being a feature of the root or n, contrary to what is argued in Julien (2005) as well as in Alexiadou (2004) and Kramer (2014).

The functional D head provides a feature matrix that must be made visible by the best matching available exponent, in accordance with the Subset Principle. If English made use of the same structure with the same feature matrices, one could insert exponents from both languages. However, as gender is a non-existent feature in English, and since number is not expressed on the definite/indefinite article, English does not have exponents matching the relevant feature matrices, such as [+DEF, +F, +SG] for *-a* in *fielda*, or [+DEF, +M, +SG] for *-en* in *graveyarden*. Consequently, only Norwegian exponents will do. The structure for (22a) is illustrated in (24).

(24)



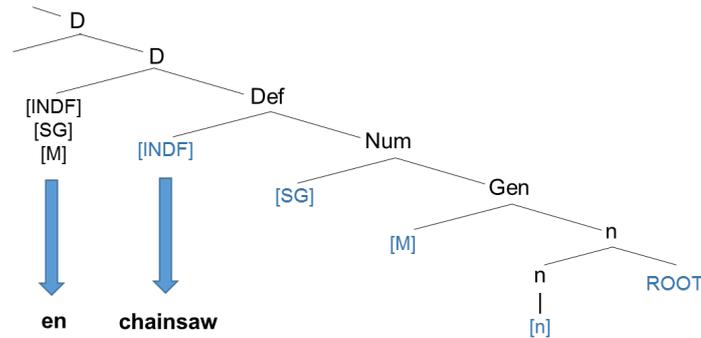
The fact that features that are non-existent in English but existing in Norwegian are assigned to English nouns in American Norwegian is of particular interest. This is illustrated for gender in (22), where the nouns have suffixes denoting either feminine, masculine or neuter gender. It also shows up on the articles chosen to accompany singular, indefinite nouns borrowed from English, as illustrated in (25).

(25)

- | | |
|---|-----------------------|
| a. en chainsaw
<u>a</u> -INDEF.M.SG. <u>chainsaw</u> -INDEF.M.SG
'a chainsaw' | (blair_WI_07gm) |
| b. en strap
<u>a</u> -INDEF.M.SG. <u>strap</u> -INDEF.M.SG
'a strap' | (coon_valley_WI_04gm) |
| c. en permit
<u>a</u> -INDEF.M.SG. <u>permit</u> -INDEF.M.SG
'a permit' | (westby_WI_06gm) |
| d. en licence
<u>a</u> -INDEF.M.SG. <u>licence</u> -INDEF.M.SG
'a licence' | (westby_WI_06gm) |
| e. ei nurse
<u>a</u> -INDEF.F.SG. <u>nurse</u> -INDEF.F.SG
'a nurse' | (coon_valley_WI_02gm) |
| f. ei field
<u>a</u> -INDEF.F.SG. <u>field</u> -INDEF.F.SG
'a field' | (westby_WI_01gm) |
| g. ei stor family
<u>a</u> -INDEF.F.SG. <u>large family</u> -INDEF.F.SG
'a large family' | (harmony_MN_02gk) |
| h. ei slik turkey cooker
<u>a</u> -INDEF.F.SG. <u>such turkey cooker</u> -INDEF.F.SG | (westby_WI_01gm) |

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(27)



Keep in mind that within a lexicalist or endoskeletal model where features are inherent properties of individual lexical items, one could not readily explain how an English lexical item, such as *chainsaw*, receives gender – as it can only project the features inherent to it, and English nouns are not assumed to have gender features. As shown, the exoskeletal model proposed here, on the other hand, explains both why and how this assignment of otherwise alien features takes place.

5. Conclusions

To conclude, we have argued that language mixing data provide important evidence for grammatical theory. More specifically, the data from language mixing in American Norwegian that we have been discussing support a late-insertion exoskeletal model of grammar whereby the functional part of the sentence constitutes a template or frame in which lexical content items are inserted.

The primary explanatory device in an exoskeletal analysis is the syntactic template or frame, and although we assume that the existence of features and feature matrices is important as explanatory devices, features still have a somewhat reduced role and scope in our analysis as compared to mainstream minimalist theory. More concretely, we claim that the syntactic functional structure is generated by way of bundles of abstract formal features, i.e. feature matrices consisting of abstract morphemes. These features generate a syntactic template or frame. For the realization of the feature matrices, we assume a set of vocabulary insertion rules. Based on a specific version of the subset principle, we have argued that as the functional feature matrices belonging to the matrix language rarely will match the feature specifications of the functional exponents of an embedded language equally well or better than the feature matrices belonging to the matrix language itself, there is a strong tendency for functional morphology to be provided by the matrix language. We have shown this to be the case in American Norwegian. As discussed, we assume that there will be a preference for functional exponents from the matrix language even when the exponent from the embedded language is equally well matched.

On the other hand, lexical content items are freely inserted into designated slots in the structure generated by the abstract feature matrices, and importantly there is no feature-matching requirement pertaining to content items. As a result, these items are freely inserted and can be picked from any language. Thus, as we have shown, American Norwegian often contains content items (stems) from English.

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