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The influence of non-native morphosyntax and phonology on the intelligibility of a closely related language

1 INTRODUCTION

This article discusses the role that a foreign morphology and syntax might play for the comprehension of a closely related language. We investigate this with an experiment testing Danish listeners' comprehension of Norwegian morphology, syntax and phonology. The claim that differences in morpho-syntax have an influence on our comprehension abilities when listening to a closely related language is previously untested. This study aims to rectify this and add to our understanding of how individual linguistic factors contribute to comprehension of speech. Before turning to the details of the experiment we present some background literature about mutual intelligibility in Scandinavia alongside general literature about the role of syntax for intelligibility.

2 BACKGROUND

The Scandinavian languages Swedish, Danish and Norwegian are closely related. Within the Scandinavian Germanic speech community, communication mostly happens in speakers' native varieties rather than in a lingua franca. This situation differs from inter-dialectal communication where speakers mostly have a standardised variety to refer to if miscommunication occurs. The situation in Scandinavia has been referred to as one of 'receptive bilingualism' (Braunmüller and Zeevaert, 2001) or 'semi-communication' (Haugen, 1966). The intelligibility between speakers of Swedish, Danish and Norwegian is far from perfect, however.

Extra-linguistic factors like attitudes and contact frequency have been identified as influential for intelligibility of closely related varieties within Scandinavia (Delsing and Lundin-Åkesson, 2005) but a causal relationship between the extra-linguistic factor attitude and

comprehension is difficult to establish (van Bezooijen and Gooskens, 2007). Previous research has also shown that intrinsic linguistic factors play a role for the comprehension of a closely related language. In addition to lexical differences, phonetic distances between the languages as well as differences in word length, word frequencies and the occurrence of foreign sounds were found to affect intelligibility negatively between speakers of Scandinavian languages (Gooskens, 2007; Kürschner et. al 2008). There has been very limited research as of yet, however, of the role that syntactic differences might play for the comprehension of closely related languages.

This article focuses on that topic within the Scandinavian linguistic community, an ideal situation to explore the role of syntactic differences on comprehension. The Scandinavian languages Norwegian, Swedish and Danish have a large number of cognate words in common. They differ rather substantially with respect to their phonologies, but only minor morphological and syntactic differences exist between them. The languages are all verb-second languages, for example, all have expletive subjects, and suffixes to express definiteness on nouns (for a discussion in English of more syntactic similarities between Scandinavian languages see Holmberg and Platzack, 2005). These three national languages are thus structurally similar to a large degree but with certain differences. Investigations of the relative influences of these differences on comprehension help create a clearer view of which linguistic factors are important to aid multilingual communication.

Some empirical studies of differences in morphology or word order have previously been conducted in the Scandinavian speech community, but these are concerned with differences in production rather than the potential problems differences might cause for comprehension. Ridell (2008) studies speech accommodation in Swedes and Danes who work together, and focuses partly on syntactic differences. She notes that word-order differences between Danish and Swedish are rare and that particle placement in phrasal verb constructions is the only difference frequent enough to study quantitatively. Her results show that Swedish speakers accommodate the particle placement pattern in their speech towards that of Danes (Ridell, 2008:65,203) but it is unknown whether these results mean that particle placement differences play a role for Danes' comprehension of Swedish in the first place.

When it comes to the role that syntax plays for comprehension of a variety that is linguistically similar to one's own, studies have focused largely on comprehension of or by second language learners. Van Heuven and de Vries (1981), for example, investigated the impact of foreign phonic features versus foreign non-phonic features word order, lexical choice and morphological features on the comprehension of spoken Dutch. The non-phonic factors were influential for the native listeners' comprehension of the speech material but phonic factors contributed more to listeners' comprehension than did the non-phonic ones (see also van Heuven and de Vries, 1981:316). Blau (1990) found that although syntactic modifications to English affect second language learners' comprehension when reading, the effect of such modifications was not significant for the comprehension of spoken language.

The role of morphosyntactic differences for comprehension of a different dialect or, specifically, a standard variety, has also received some attention in previous studies. Speidel *et al.* (1985), investigated to what degree a simplified syntax or a native phonology might improve Hawaiian English school children's comprehension of Standard English. A simplified syntax,

attained by reducing morphological complexity, had no significant effect on children's comprehension of a different dialect.

The question of how humans process and understand sentences has received attention in different linguistic disciplines. What most accounts have in common is an agreement that grammatical constructions are created online by the listener during the comprehension process (e.g. Frazier 2002 [1987]). We assume that the comprehension of a foreign word order can be compared to the comprehension of scrambled sentences. When confronted with sentences where a word is not in its canonical order it is believed that a listener relies somewhat on the distance between the canonical gap and the word that has been moved. Nearby words are more likely to be associated with one another (Fodor and Frazier, 1980:442) and it is therefore assumed that the greater the linear distance of the displacement is between the actual (incorrect) and the canonical sentence position of a word (or larger constituent), the longer comprehension will take (cf. Sekerina, 2003). A question that needs more investigation, however, is whether syntactic anomalies in foreign linguistic varieties are processed in the same manner. This article discusses this issue in greater detail and explores whether the processing of Norwegian syntax and morphology is problematic for Danes in comparison with the processing of Danish syntax and morphology by the same listeners.

The focus of this article is to explore the relative influence morphosyntactic differences might have on comprehension of aural input as opposed to the influence of phonological differences. It is hypothesised that aural comprehension of sentences is the most efficient in one's native phonology and morphosyntax. Furthermore we predict that input with native phonology but foreign morphosyntax will make comprehension more difficult but less difficult again compared to input with foreign phonology but native morphosyntax. The prediction is also that sentences where both phonology and morphosyntax is foreign are the most difficult to comprehend for listeners. To investigate the issues above, an experiment was designed to assess to what degree aural comprehension is compromised by differences in phonology and morphosyntax between Danish and Norwegian for Danish listeners.

3 METHODOLOGY

3.1 Stimuli

Identifying syntactic differences between varieties is not straightforward. It is difficult to create an exhaustive overview of all syntactic differences that exist between two languages, even if one were to consider written language only. There is little data available on syntactic constructions that are possible in spoken varieties of Scandinavian languages (although these are currently being mapped out in the projects attached to the ScanDiaSyn network (ScanDiaSyn, 2010)). Constructions that are available in the standard written languages were therefore chosen for the current investigation. The syntactic constructions were identified by consulting literature for Norwegian, Swedish and Danish learners of the neighbouring languages. A number of syntactic constructions that cause problems for Scandinavian learners of another Scandinavian language are described in the literature about inter-Scandinavian language learning (e.g. Brøndsted, 1967; Christensen, 2007; Teleman, 2008). The accounts assess which linguistic factors cause problems

for Scandinavian learners of other Scandinavian languages and hence also give an indication of which linguistic factors are different between the languages.

According to the literature written on inter-Scandinavian language learning (Brøndsted, 1967; Christensen, 2007; Teleman, 2008) the biggest discrepancy in syntactic constructions identified is between Danish and the other two Scandinavian national varieties. We therefore decided to test the influence on comprehension of differences between Norwegian and Danish, as the number of cognate words has been shown in an earlier study (Gooskens, 2007) to be somewhat larger between these two varieties than between Swedish and Danish. An aim for the investigation design was to create stimuli that consisted of cognate words only so as to enable testing of the particular influence of phonology and morphosyntax (as opposed to the influence of lexical differences).

Testing whether constructions in Norwegian are problematic for Danes (rather than whether Danish constructions are problematic for Norwegians) was believed the most likely to yield results in this study. This is because the number of differences between Norwegian and Danish are not symmetric. Because syntactic variability is wide-spread in the languages, and perhaps especially in Norwegian, the problematic syntactic constructions for Danes in Norwegian do not necessarily have corresponding problematic constructions for a Norwegian in Danish. A number of constructions available in Norwegian do not exist in Danish, e.g. double marking of demonstratives, or placement of phrasal verb particles before, rather than after, an object. Although phrasal verb particles are always placed after the object in Danish sentences, however, this is a variable feature in Norwegian, where particles can either be placed before or after the object, as is also the case for English in the following Norwegian example: *Jeg skrudde lyset av* 'I switched the lights off' and *Jeg skrudde av lyset* 'I switched off the lights'. The syntactic constructions used for this type of experimental study are therefore only problematic to listeners from one language group (e.g. Danes listening to Norwegian), but not the other (e.g. Norwegians listening to Danish) due to more syntactic variants being available in the latter's language.

Five syntactic or morphosyntactic constructions in Norwegian that Danes struggle with when learning the language were chosen for our experimental study. All of the Danish construction variants are also possible (although somewhat archaic) constructions in Norwegian.

Firstly, a number of Germanic languages, including Norwegian, have variable particle placement in clauses consisting of a transitive particle verb (a phrasal verb) and its object, but Danish does not (cf. Holmberg and Platzack, 2005:427). This means that in Norwegian both construction 1a and 1b exists, whereas in Danish, 1b is ungrammatical. In phrases consisting of a transitive particle verb and a direct object, the particle always succeeds the object in Danish. In Norwegian, this is variable, and the particle can be placed before the object. Construction 1b, ungrammatical in Danish, but grammatical in Norwegian, may therefore present a comprehension problem for a Dane listening to Norwegian.

1a	*En*	*mann*	*spiser*	*maten*	*opp*
	A	man	eats	food+THE	up
	'A	man	eats	the food'	

1b	*En*	*mann*	*spiser*	*opp*	*maten*
	A	man	eats	up	food+THE
	'A	man	eats		the food'

The second syntactic difference tested is the placement of infinitive markers and negators, also a word-order difference between the two varieties. In Danish the infinitive marker cannot precede negation, whereas in Norwegian, the infinitive marker can both precede and succeed negation before a verb phrase. In Norwegian this variability could reflect a semantic difference, cf. example 2a and 2b. Note that sentences with this semantic difference are not used as experimental stimuli for the current investigation.

2a	*Jeg*	*lover*	*å*	*ikke*	*vanne*	*blomstene*
	I	promise	to	not	water	flowers+THE
	'I	promise	to	not	water	the flowers'
2b	*Jeg*	*lover*	*ikke*	*å*	*vanne*	*blomstene*
	I	promise	not	to	water	flowers+THE
	'I do not	promise	to		water	the flowers'

It is not possible to create this distinction in Danish, however, where the infinitive marker always follows the negator (cf. Christensen, 1997). This means that a sentence like 2d will be ungrammatical to a Dane, whereas it will be one of two possible constructions in Norwegian. 2c is grammatical in Danish.

2c	*Fotomodeller*	*prøver*	*ikke*	*å*	*bli*	*tykke*
	models	try	not	to	become	fat
	'Models	try	not	to	become	fat'
2d	*Fotomodeller*	*prøver*	*å*	*ikke*	*bli*	*tykke*
	models	try	to	not	become	fat
	'Models	try	to	not	become	fat'

For stimuli belonging to this category, only sentences that are semantically near-identical (in Norwegian) were chosen, as in 2c and 2d, instead of constructions that result in entirely dissimilar meanings like in 2a and 2b.

Thirdly, there exists a difference between Norwegian and Danish in the usage of the reflexive possessive pronouns. In Norwegian, the reflexive possessive pronoun *sin(e)* can refer back to both plural and singular subjects, whereas the form can only refer back to a singular subject in Danish. The Danish plural reflexive pronoun is *deres*, which is the same form as the 3pl possessive pronoun, also used as such in Norwegian. The semantic scope of the reflexive marker *sine* is thus that it can express either a singular or a plural subject's possession in Norwegian, while it can only express a singular subject's possession in Danish. It is believed, therefore, that a

sentence like the one presented in 3b may cause some comprehension difficulty for a Danish listener of Norwegian. Only 3a is a grammatical Danish construction, whereas both constructions are grammatical in Norwegian. In Norwegian, the first sentence could be read as referring to another proprietor of the flowers than 'the gardeners', however. 3b is ungrammatical in Danish. The gloss in 3a represents the meaning of the sentences in both Danish and Norwegian, while the gloss in 3b represents the meaning of the sentence in Norwegian.

3a	*Gartnere*	*vanner*	*deres*	*blomster*
	Gardeners	water	their (?own)	flowers
	'Gardeners	water	their	flowers'
3b	*Gartnere*	*vanner*	*sine*	*blomster*
	Gardeners	water	their own	flowers
	'Gardeners	water	their own	flowers'

The fourth construction type is a morphological difference that exists between the varieties: the marking of definiteness in nouns. In Norwegian (and Swedish) demonstrative noun phrases the marking of definiteness occurs twice, once with an overt definite article (*den* 'the' or 'that' or *denne* 'this', for example) and with a definite article suffix. In Danish noun phrases, the definiteness is only marked once. A definite phrase is marked with a definite article suffix on the noun. If the phrase is demonstrative, a definite phrase is marked with a definite article before the noun phrase. The morpheme used in Norwegian for definiteness in a demonstrative phrase is therefore not foreign to Danes. The same definite-article morpheme is found in their native language. It is the double marking of definiteness that is the anomaly.

In rare instances, spoken Norwegian also shows the single marking of definiteness in these types of sentences. This is the variable in certain expressions, like ***den*** *amerikanske president* or ***den*** *amerikanske president****en*** 'the American president'. To Danes, the extra marking of definiteness on the Norwegian nouns may cause some comprehension problems. 4a is grammatical in Danish (but archaic in Norwegian). 4b is ungrammatical in Danish and the unmarked variant in Norwegian.

4a	*Februar*	*er*	*den*	*korteste*	*måned*
	February	is	the	shortest	month
	'February	is	the	shortest	month'
4b	*Februar*	*er*	*den*	*korteste*	*måneden*
	February	is	the	shortest	month+THE
	'February	is	the	shortest	month'

The final and fifth construction that may prove difficult for Danes in Norwegian is both morphological and word-order based: the placement of possessive pronouns and the addition of a definite article suffix in possessive noun phrases. In Danish (and Swedish) the possessive

pronouns are placed before the noun. The pre-posed possessive marker also marks definiteness (cf. Holmberg and Platzack, 2005:440). In Bokmål Norwegian, however, the possessive pronoun can either be pre-posed, as in Danish, or post-posed. When post-posed, the possessive pronoun does not work as a definite marker and a definite article suffix must be added to the noun. Norwegians thus have available sentence type 5a as well as 5b, whereas the 5b is ungrammatical in Danish.

5a	*En*	*bonde*	*arbeider*	*på*	*sin*	*traktor*
	A	farmer	works	on	his	tractor
	'A	farmer	works	on	his	tractor'
5b	*En*	*bonde*	*arbeider*	*på*	*traktoren*	*sin*
	A	farmer	works	on	tractor+THE	his
	'A	farmer	works	on	his	tractor'

3.2 The Experiment

To test the effect of the Norwegian (morpho-)syntactic constructions described above on comprehension by Danish listeners, a sentence plausibility experiment was designed where informants had to judge the content of aural input as 'plausible' or 'implausible'. This approach was chosen over a more traditional sentence verification test (where the content would be deemed as either 'true' or 'untrue') as it was considered impossible to design enough sentence types for the experiment that are universally true at the same time as being formulated within the syntactic frameworks discussed above.

3.3 The Participants

The participants in this investigation were all native Danish speakers from the Jylland (N=45) and Copenhagen (N=8) areas. In the chi-square analysis of correct answers there were no significant differences between speakers from these two regions in the sample. The informants are therefore all included together in the analysis. The subjects ranged between 21 and 50 years old. Twenty-five informants were female and 28 were male. For the analysis of reaction times (discussed in 3.2), a subsample of 41 right-handed informants was used.

3.4 The Stimulus Material

Forty sentences consisting of cognate words only were constructed for the experiment: eight sentences for each syntactic construction type. Four of these eight had a semantic content that could be deemed plausible while the other four were semantically implausible. The distribution of the sentences across construction types and plausibility are given in table 1.

Table 1 The distribution of test sentences across construction type and plausibility conditions

	Particle Placement	Infinitival and negator placement	Possessive Type	Double definiteness	Possessive Placement
Plausible	4	4	4	4	4
Implausible	4	4	4	4	4
Total	8	8	8	8	8

Certain sentences in the corpus consisted of semantically related words, as 'only child' and 'sister' as above or 'doctors' and 'patients' in the sentence 'doctors treat their patients'. Semantically related concepts like these were found both in implausible as well as plausible conditions. Some sentences did not have related concepts, but could still be deemed plausible or implausible from the context. An example is the sentence 'A man prints out an article', a sentence with plausible content. Only sentences that were deemed semantically unambiguous in a pre-test with a small group of native speakers of Danish and Norwegian were included in the experiment. All 40 statements in the experiment were articulated in the present tense. None of the content words in the stimuli are used more than twice. See appendix A for all test sentences used in the experiment.

Stimulus recording

The 40 sentences described above were recorded in four different conditions: with Danish phonology and Danish morphosyntax (condition A), with Danish phonology but Norwegian morphosyntax (condition B), with Norwegian phonology but Danish morphosyntax (condition C), and with Norwegian phonology and Norwegian morphosyntax (condition D). A bilingual speaker was chosen to produce the stimuli to control for differences in personal voice characteristics between the conditions. All sentences consisted of morphemes that are available in Danish as well as Norwegian. The bilingual speaker was therefore presented with an unnatural, yet fairly unproblematic task when producing the sentences in different conditions.

The bilingual speaker was born in the Aarhus area in Denmark but had lived in Oslo, Norway, from the age of 8. Two 'voice parades' were designed to test how native the bilingual speaker sounded to Norwegian and Danish listeners. For both voice parades text passages were recorded and presented to listeners through a web site. Listeners were asked to state to which degree the recordings they heard sounded foreign. In the Danish voice parade, four recordings of the same text passage were presented to listeners. One of these recordings was made by the bilingual speaker. The three others were produced by native Danish speakers from Aarhus and Aalborg, i.e. the same geographical area that the bilingual hailed from. The Norwegian voice parade consisted of five recordings of the same text passage. The distracter recordings in the Norwegian version were all recorded by speakers from Oslo. In neither test was the bilingual speaker rated significantly less native sounding than the other speakers. In both tests, one, or more, recordings of native speakers scored worse on a perceived native-ness scale than the

bilingual speaker. We claim therefore that all stimuli recorded for the experiment sound natively Norwegian and Danish, phonetically speaking.

Running the Experiment

Our experiment was designed and conducted using E-prime, version 2.08.22. Informants were first presented with a short demonstration task where they heard two sentences with Danish phonology and two sentences with Norwegian phonology. The syntactic structure of these test sentences were both grammatical in Norwegian and Danish, and sentences consisted of cognate words only.

In both the demonstration task, as well as the actual experimental setting, listeners were instructed to listen to sentences and evaluate their content as either 'plausible' or 'implausible'. Subjects wore headphones and heard the stimuli while an hour glass and the two alternative answers 'implausible' and 'plausible' were displayed on the computer screen in front of them. Two keys on the keyboard, M and Z on a Standard Dutch Qwerty Keyboard, were marked with a green and a red sticker, respectively. The green key (to the right) represented a plausible reply, and the red (to the left) represented an implausible reply. All informants were informed explicitly, by the experimenter, that they should respond as quickly and correctly to the stimuli as possible by pressing the appropriate key on the keyboard.

The recorded sentences (160 in total) were not all presented to the same informants. A crossed design was used, such that each informant heard the 20 plausible and 20 implausible sentences divided equally over the four phonology-by-morphosyntax conditions. Listeners heard the same sentence in just one version and heard an equal number of sentences (10) from every morphosyntax-by-phonology condition. Correct responses as well as decision times were collected from the informants. All informants participated in the experiment on the same laptop computer.

3 RESULTS

A number of sentences with Danish phonology and Danish morphosyntax were judged incorrectly by the Danish listeners. No listener replied correctly to all stimuli. The errors the listeners made in each condition are presented in table 2.

Table 2 N of correct replies to stimuli in the four conditions, total N responses: 2160

Response	DaPhon DaSyn (A)	DaPhon NoSyn (B)	NoPhon DaSyn (C)	NoPhon NoSyn (D)
Error	40 (7%)	49 (9%)	72 (13%)	104 (19%)
Correct	500 (93%)	491 (91%)	468 (87%)	436 (81%)
Total	540	540	540	540

As expected, the Danish listeners had fewest difficulties to comprehend sentences with Danish phonology and morphosyntax (condition A) and most difficulties to comprehend sentences with Norwegian phonology and morphosyntax (condition D). They responded correctly to 93% of the sentences in condition A, but only on 81% of the sentences in condition D. The data also suggests that sentences with native phonology and foreign morphosyntax (condition B) are easier to comprehend than sentences with foreign phonology and native morphosyntax (condition C). Ninety-one percent of the sentences in condition B are decoded, but only 87% of the sentences in condition C.

Certain sentence types were judged incorrectly in condition A by a number of informants. Some sentences were judged incorrectly only by one informant in this condition, and these are subsequently kept in the analysis. The remaining eight sentences that were judged incorrectly at least twice in the native phonology and native morphosyntax condition are excluded from the remainder of the analysis as we believe that these sentences were too problematic, semantically speaking, for the experimental design. For an overview of all the sentence types that were judged incorrectly, see appendix B. The percentages of incorrect answers for the remaining 32 sentences are presented in figure 1.

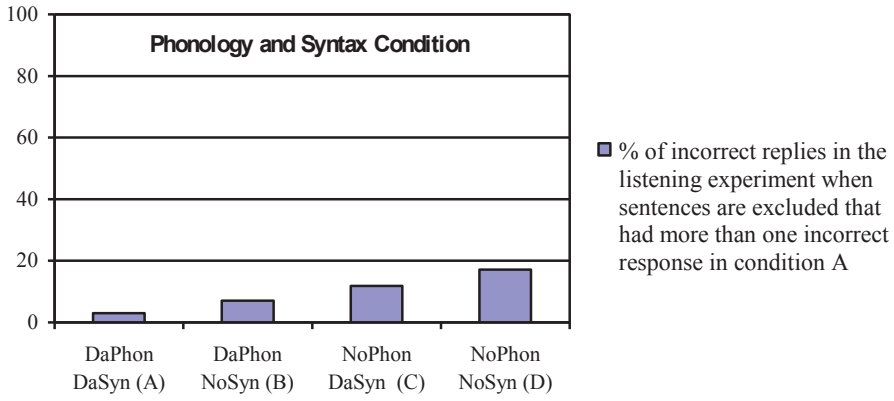

Figure 1 Percent incorrect judgments of sentences in four different phonology -by- morphosyntax conditions.

As the percentages of correct replies were not distributed normally, but all ranged from 41.3-100% they were transformed using a rationalised arcsine transform (Studebaker, 1985) to make them more suitable for statistical purposes. A 2 x 2 repeated measures ANOVA was conducted on the transformed data. The effect of phonology and morphosyntax were both reported as significant at $p < .05$. There was a significant effect of phonology on the correctness results F (1) =44.203 and of morphosyntax on the correctness results F (1) =10.203.

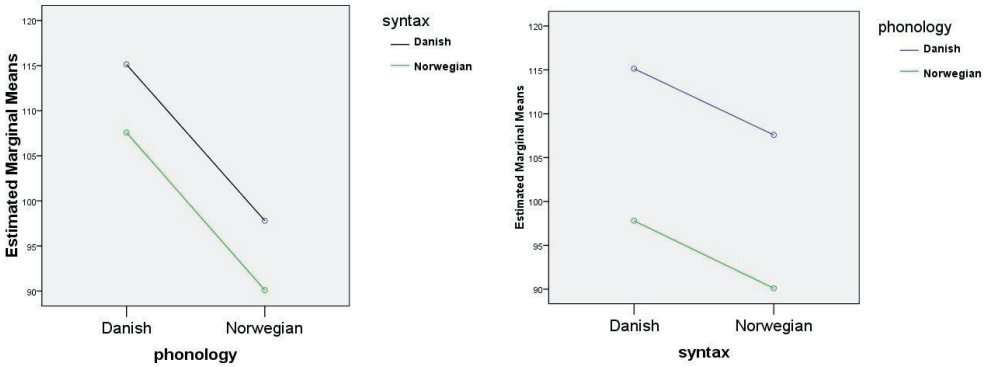

Figure 2 The effect of phonology (left) and syntax (right) on correctness results for sentences of the two morphosyntax types. As can be seen from figure 2 the introduction of a foreign phonology results in a more dramatic decline in comprehension scores than the introduction of a foreign morphosyntax does (note that the y-axis reflect the transformed correctness results).

4 CONCLUSION

The results of the current study have shown there is an effect of Norwegian morphosyntax and phonology on Danes' comprehension of sentences. When listening to sentences made up solely of cognate words and native morphemes Danish listeners do not comprehend sentences with Norwegian morphosyntactic constructions as well as sentences with Danish morphosyntactic constructions. Likewise, a Norwegian phonology impedes sentence comprehension for Danish listeners. Although they both play a role, the influence of a foreign phonology on comprehension appears to have a more dramatic effect on comprehension than the influence of foreign morphosyntax. It was hypothesised that comprehension would be slowest for Danish listeners when hearing sentences with phonology and morphosyntax from the closely related language Norwegian.

The findings of this study are in line with previous literature on sentence comprehension in a closely related variety. The finding that phonological differences play a larger role for comprehension than syntactic differences do was indicated by previous studies such as Van Heuven and de Vries (1981), who found that word order, morphological features as well as lexical choice affect comprehension of spoken Dutch. They also concluded that the role of phonic factors was much larger as that of non-phonic factors. One of the reasons why the phonological differences have a larger effect on intelligibility in our study could be the fact that there are simply more phonological differences in the stimuli than there are morpho-syntactic differences. Future studies should investigate this in more detail and determine whether it is also the case that phonological differences play a large role if there is only a smaller number of them. It could also be the case that certain phonological differences are more difficult to process than others. If

one were to control for prosodic and segmental features individually, one could investigate whether one of the two factors have a larger effect on intelligibility. This is also a question that researchers can investigate in more detail in the future.

This current study has not investigated the influence of lexical choice on comprehension, as was done by van Heuven and de Vries (1981), but this factor could be another important constraint on sentence comprehension and can be investigated more in depth in future studies, especially within Scandinavia. It could be that the usage of a word that is a cognate, but that does not entirely overlap semantically in the two languages, also provides difficulties for comprehension of a closely related language. Word frequency and complete semantic overlap was not controlled for in the stimuli for the current experiment. Neither has the current study looked at the relative influence on comprehension of different types of lexical content in the stimuli. It could be that a significant difference in comprehension can be found between sentences that have semantically related concepts, such as 'doctors treat their patients' and sentences with content words that are less closely connected semantically, like 'a man prints an article out'. It could be that morphosyntax plays a larger role for sentence comprehension when the lexical content of sentences is not semantically related, and future research could focus more on this possibility.

Overall, the results presented in this article indicate that there is an effect of morphosyntactic differences on the mutual intelligibility within the Scandinavian linguistic area. The finding that phonology plays a large role for comprehension is in line with previous studies of speech intelligibility in Scandinavia (e.g. Gooskens, 2007; Kürschner *et al.* 2008). The effect of morphosyntactic differences must not be disregarded in future studies, however. The effect of these types of differences is likely to be found also for the other language pairs in the area (Swedish and Norwegian, and Swedish and Danish). Syntactic differences also, presumably, play a role for Norwegians comprehension of Danish, although this was not investigated empirically in this study. What is more one could deduce that syntactic differences also play a role for intelligibility of a different *dialect*. The fact that syntactic differences influence our ability to comprehend sentences should have implications for teaching in schools where children are expected to understand a standard language but have a non-standard native syntax themselves. Awareness of which individual linguistic factors that determine intelligibility is important then not only to improve communication between speakers of closely related languages, but also in other situations of receptive bilingualism and in situations of (language) learning and teaching.

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APPENDIX A: ALL SENTENCES

Training sentences

Plausible

Drager finnes i eventyr

'Dragons exist in fairy tales'

Et hus er større enn en bil

'A house is larger than a car'

Implausible
Russland er Europas minste land
'Russia is the smallest country in Europe'
En fisk leser sin avis
'A fish reads his newspaper'

Test sentences
Plausible
En mann skriver ut en artikkel
'A man prints out an article'
En rådgiver ramser opp en liste
'A councillor regurgitates (*up) a list'
En politibetjent legger ned en penn
'A police officer puts down a pen'
En nabo finner frem en sykkel
'A neighbour takes out a bike'
Farmor er i familie med faren min
'Grandma (lit. Father's mum) is related to my father'
Du ser med øynene dine
'You see with your eyes'
En statsminister leder regjeringen sin
'A prime minister leads his government'
'Ministerens sekretær skriver brevet hans
The minister's secretary writes his letter'
Lærere underviser sine elever
'Teachers teach their pupils'
Leger behandler sine pasienter
'Doctors treat their patients'
Gartnere vanner sine blomster
'Gardeners water their flowers'
Hunder følger gjerne sine eiere
'Dogs follow their owners gladly'
De fleste mennesker håper å ikke bli syke
'Most people hope to not become ill'
Konkurransedeltagere ønsker å ikke tape
'Competitors wish to not lose'
Flaggermus pleier å ikke pusse vinduer
'Bats usually do not clean windows'
Fotomodeller prøver å ikke bli tyke

'Photo models try to not become fat'
I kristendommen er bibelen den viktigste boken
'In Christianity the Bible is the most important book'
I Danmark er København den største byen
'In Denmark, Copenhagen is the largest city'
Februar er den korteste måneden
'February is the shortest month'
I England er engelsk det viktigste språket
'In England English is the most important language'

Implausible
Et bibliotek låner ut kaffe
'A library lends out coffee'
Et insekt leser av temperaturen
'An insect reads off the temperature'
En gris legger ut penger
'A pig advances money'
En elefant slår opp et ord
'An elephant looks up a word'
Et enebarn leker med søsteren sin
'An only child plays with its sister'
Du lukter med hendene dine
'You smell with your hands'
En katt snakker med moren din
'A cat speaks with your mother'
Jeg er eldre enn faren min
'I am older than my father'
Hester spiser sine hover
'Horses eat their hooves'
Kaniner selger sine haler
'Rabbits sell their tails'
Elektrikere drikker sine ledninger
'Electricians drink their cables'
Mekanikere koker sine biler
'Mechanics boil their cars'
Piloter håper å ikke lande trygt
'Pilots hope to not land safely'
Forfattere ønsker å ikke skrive
'Writers wish to not write'
Fugler pleier å ikke kunne fly

'Birds are usually not able to fly'
Vektløftere prøver å ikke bli sterke
'Weight lifters try to not become strong'
Sukker er den sunneste maten
'Sugar is the healthiest food'
I Sverige er gress den sjeldneste planten
'In Sweden grass is the rarest plant'
Murstein er den mest dyrebare edelstenen
'Bricks are the most valuable jewel'

APPENDIX B

Construction type	Sentence	Plausible?	N error responses
Particle placement	A police officer puts a pen down	Yes	6
	A councillor reads a list out loud	Yes	5
	A neighbour takes the bike out	Yes	4
	An insect reads (out) the temperature	No	2
	A pig makes an advance payment	No	1
Possessive placement	You smell with your hands	No	3
	I am older than my father	No	2
	An only child plays with its sister	No	1
	The minister's secretary writes his letters	Yes	1
Possessive type	Dogs like to follow their owners	Yes	1
	Doctors treat their patients	Yes	1
	Mechanics boil their cars	No	1
Negator and infinitival placement	Bats usually do not clean windows	Yes	3
	Photo models try not to become fat	Yes	2
	Participants in contests do not wish to lose	Yes	1
	Most people hope not to become ill	Yes	1
	Pilots hope not to land safely	No	1
	Weight lifters try not to become strong	No	1
	Birds usually do not fly	No	1
Demonstrative marking	February is the shortest month	Yes	1
	Bricks are the most valuable precious stone	No	1