Towards an interactive account of word intelligibility

The case of Saterland Frisian and German

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Contents

1 Introduction

1.1 Overview

The present study seeks to fulfil two objectives – the first is to demonstrate that intelligibility of the surrounding context is a determinant of word intelligibility in an unfamiliar written language, as are word cognacy and predictability of context. The second is to shed light on how context intelligibility interacts with word cognacy in conditioning word intelligibility, i.e. what influence varying context intelligibility has on the transparency of cognates and non-cognates.[1] [2]

To this end, I will present a series of experiments testing the intelligibility of Saterland Frisian (Anglo-Frisian/ West Germanic, Germany) to native speakers of the German variety of Standard High German. I ultimately show that a context made more intelligible by cognates contained within is more important to word intelligibility than cognacy of the word itself, thereby establishing context intelligibility as a key factor affecting word intelligibility at least in the written modality. I also present evidence that an intelligible context increases the transparency of non-cognates more substantially than that of cognates, and argue that this motivates more research into how the factors behind word intelligibility interact with each other.

This paper is structured as follows:

The remainder of this section will define the main concepts underpinning this study and provide a brief overview of prior research on the relationship between cognacy, contextualisation and mutual intelligibility. Section 2 then introduces some sociolinguistic background to Saterland Frisian and compares its linguistic features to German. Sections 3 and 4 present three experiments that build on each other and ultimately demonstrate that an intelligible context affects word transparency, but the degree to which it does so depends on target word cognacy. Subsequently, section 5 theorises about the reasons for which context intelligibility has as sizeable an influence on word intelligibility and relates the findings of the experiments to the existing literature. Finally, section 6 concludes.

1.2 Definitions

This subsection will set out the scope of the study and the key terms used here. These revolve around intelligibility at the word level, something I will also refer to interchangeably as ‘transparency’. As mentioned above, the experiments carried out as part of this study focus on Saterland Frisian (STQ), which will be introduced at greater length in section 2, and Standard High German as spoken in Germany, which I will term ‘German’ for short.

In this context, ‘cognate’ will refer to a STQ word which has an etymologically related equivalent in German, showing systematic phonetic correspondences and a high degree of semantic similarity. Examples of words that fulfil these three criteria are as follows:

1 My heartfelt thanks go to Dr Henk Wolf of the Seeltersk-Kontoor for his patience in translating and proofreading my Saterland Frisian stimuli. This study would not have been possible without his help.

2 Glosses in this study abide by the Leipzig Glossing Rules.

Table 1 – Categories of words considered cognates between Saterland Frisian and German

	Saterland Frisian	**German**
shared stem	*Húus* (‘house’)	*Haus*
shared stem, shared affixes	*bi-drouv-ed* (‘depressed’)	*be-trüb-t*
shared stem, differing prefix, semantically identical	*ou-wisk-je* (‘to wipe’)	*aus-wisch-en* (*ab-wisch-en* the fully cognate form)

Non-cognates are words that do not fulfil these criteria. For instance, non-transparent compound words in STQ that are entirely composed of cognates to German but which are not themselves found in German are considered non-cognates. An example is the STQ verb *bigrootsnuutje* (‘to judge disdainfully’), whose three constituent elements (*bi-* VERBAL PREFIX, *groot* ‘big’, *Snute* ‘snout’) have cognates in German (*be-*, *groß*, *Schnauze*), but which is not itself found in German.

Likewise, false friends – as will be discussed in 2.2.4 , fail the semantic similarity criterion and are therefore not cognates under my definition. More examples of cognates and non-cognates will be adduced in that subsection.

1.3 Existing research

The brief literature review in this subsection seeks to make three points – the first that in isolation cognates are more intelligible than non-cognates, subject to the influence of phonological distance; the second that the characteristics of the surrounding context are another important determinant of word transparency, which have however been largely neglected thus far; and the third that cognacy and context interact. The short exposition to follow will make clear the gap that this study shall attempt to fill and lay the groundwork for the experiments to be presented in sections 3 and 4.

1.3.1 Cognates aid comprehension

The lexical distance between two languages – i.e. the number of cognates they share – has been identified by many scholars as a crucial measure of mutual intelligibility, with a greater number of cognates generally correlating with higher intelligibility (e.g. Heeringa et al. 2014, Golubovic 2016). Cognates are in fact cognitively salient in language learning (Hall 2002, Vanhove & Berthele 2015) and word recognition in an L2, with a ‘cognate facilitation effect’ having been identified on these fronts (e.g. Dijkstra et al. 2010).[3]

To date, research has demonstrated that cognates in isolation generally facilitate word-level comprehension when people encounter an unfamiliar language that shares a sizeable amount of its vocabulary with their L1 (Otwinowska & Szewczyk 2019, Toassi & de Albuquerque Pereira 2019).

However, although cognacy and mutual intelligibility are clearly correlated, there is evidence of a sizeable gap between both measures. Most tellingly, data from Van Bezooijen & Gooskens (2005) cited in Swarte & Hilton (2013:282-3) shows that Afrikaans texts were only 59-66% intelligible to

3 Lexical distance may be asymmetrical (Gooskens & Swarte 2017:132), but this is not relevant for our purposes as the present study only focusses on one-way intelligibility of STQ to German speakers.

Dutch speakers even though 84-100% of the content words in them were cognates and Afrikaans is a relatively recent descendant of Dutch. Similarly, Swarte & Hilton (2013) found that the mutual intelligibility between North and West Frisian, close relatives of Saterland Frisian, was significantly lower than the proportion of cognates in the texts used would have us believe. The authors of these studies attribute this disparity to several factors that bear heavily on cognate intelligibility, most notably of which for the purposes of this study is phonological/ orthographic distance.[4]

1.3.2 Abduction and phonological distance

Working out how words in an unfamiliar language relate phonologically to cognates in one's L1 reportedly forms the basis for figuring out sound correspondences between both languages, in a process dubbed 'abduction' (Berthele 2011). The main idea is that identifying and generalising these correspondences allows one to make sense of cognates in the unfamiliar language, facilitating comprehension on the word level. Crucially, as abduction presupposes that a word is recognisable as a cognate, if the phonological distance separating two words is so great that they cannot even be identified as cognates in the first place, we would expect abduction to fail and intelligibility to be compromised.[5] The same applies to non-cognates, to which abduction cannot be productively applied due to the absence of regular sound correspondences.

In short, abduction is crucial to intelligibility, but does not apply to non-cognates. Thus, I will only discuss phonological distance in the context of obscuring cognate transparency from here on.

1.3.3 The role of context and its interaction with other factors

In addition to the factors named above, the presence of context has also been claimed to by and large enhance the intelligibility of cognates in particular. This has been found to hold true for two of the three Slavonic languages whose mutual intelligibility with Russian was tested in Stenger & Avgustinova (2021) by means of a word translation task.

Further, Jágrová (2022) presents among other experiments another word translation task that tested the effect of high-constraint contextualisation on word intelligibility. Her results are highly pertinent to the present study as they imply that the different factors bearing on word intelligibility interact, although she does not explicitly note this. The first type of interaction appears to obtain between cognacy and the presence of a predictable context, as with contextualisation, the intelligibility of non-cognates improves vastly more than that of cognates (494% for non-cognates vs 21.5% for cognates, ibid:177 comparing her 'C-C' and 'NC' categories). The second type of interaction

4 Morphological differences have also been found to affect intelligibility, but for the sake of simplicity my coverage of morphology will be restricted to the brief discussion in 2.2.5 (see e.g. Swarte & Hilton 2013). Syntactic factors will be not considered here because the differences between STQ and German in this regard are insignificant compared to the phonological and lexical disparities that will be treated in greater detail in 2.2 . An equally important reason is that syntax is controlled for in most of this study.

5 In the written modality, orthographic factors are closely associated with phonological distance, as parsers of an unfamiliar language would often attempt to pronounce words presented to them based on the spelling rules in their native language (Van Bezooijen & Gooskens 2005:10-1, Heeringa et al. 2014). Because it only focusses on the written modality, this study will consider orthographic distance as a rough gauge of phonological distance, while taking into account the language-specific points to be listed in 2.2 . From this point on, I will use the term 'phonological distance' in the specific sense of phonological distance as inferred from spelling.

concerns phonologically non-identical cognates, with contextualisation improving accuracy in the word translation task for such cognates by a significant margin, from 65.9% to 80.1% ($p < 0.01$). This may indicate that contextualisation, one, makes a bigger difference in intelligibility to non-cognates than to cognates, and two, can partly negate the effects of phonological distance.

These points taken together justify considering context a factor in word intelligibility, and may imply that the different influences on word intelligibility – in this case context and cognacy/ phonological distance – interact with each other in ways not yet fully understood.

However, despite how these studies have enhanced our understanding of the factors behind word intelligibility, their not having addressed two basic issues has precluded a comprehensive account of how these factors interact.

First, barring a handful of exceptions, there has been no direct attempt to date to confirm if, in context, cognates are more comprehensible than non-cognates as they are when in isolation. While research to date suggests that the intelligibility of a text correlates with the number of (non-)cognates it contains (e.g. Swarte & Hilton 2013, Swarte & Gooskens 2017, Jágrová 2022), those findings are not based on principled experiments that controlled for either the contextual salience or syntactic positions of (non-)cognates. As noted by Stenger & Avgustinova (2021:8), contextually important words would logically be expected to impact on intelligibility more strongly than would contextually insignificant words. Furthermore, given how the syntactic position of a word affects its intelligibility is poorly understood, it would be ideal to keep the variation in sentence structure in the texts compared to a minimum, contrary to the practice to date. Hence, despite Jágrová's (2022) tantalising findings, we cannot say with confidence that the differential effect of contextualisation on cognates and non-cognates is the consequence of these factors interacting, as her set-up did not sufficiently control for other potentially confounding variables.

Second, it is distinctly unsatisfactory to claim that the presence or absence of a predictable context could alone decisively influence word transparency. As alluded to earlier in this section, where an unfamiliar language is concerned, intelligibility cannot be taken for granted. Hence, it is doubtful if contextualisation would bring about any positive effect on cognate transparency if the context itself were unintelligible.

1.3.4 Word intelligibility and context intelligibility

Against the foregoing backdrop, my contention is that it is context intelligibility in particular – as facilitated by cognates in the surrounding context – that influences word intelligibility, not the mere presence or absence of a predictable context.

In fact, Jágrová (2022), cited above, found it necessary to include the number of non-cognates contained in a sentence as a predictor of whether the target word was translated correctly, as the presence or absence of a context in itself was not sufficient to explain the variation in accuracy of translation. There is, however, potential counter-evidence to my claim. Stenger & Avgustinova (2021) report, quite at variance with the literature cited two paragraphs above, that the number of non-cognates in their sample of Slavonic languages turned out consistently non-significant as a predictor of word intelligibility. This complication will be taken up in section 5.

Before that, I will adduce experimental evidence in section 3 showing that the presence of contextually important cognates facilitates sentence intelligibility. These experiments differ from those of Jágrová's (2022:199) in controlling for the number and position of (non-)cognates in each sentence, to the end of being able to analyse the effects of target word cognacy separately from those brought about by the cognacy of surrounding words. On this basis, I go on to assume that having cognates in the context would improve intelligibility of that context, while the absence of such cognates could be taken to indicate reduced intelligibility.

This will allow me to show in section 4 that word intelligibility is very strongly correlated with the presence of cognates in the surrounding context, i.e. by the assumptions above, the intelligibility of the surrounding context.

Before proceeding to the experiments, it would be appropriate to discuss the current status of STQ as well as its linguistic features as represented in my stimuli. This will provide us a clearer understanding of how intelligible the language would be to different groups of German speakers.

2 Background on Saterland Frisian

This section will first sum up the past and present of the STQ speech community. After that, it will provide an overview of STQ's linguistic characteristics as seen in my experimental stimuli to predict how intelligible it would be for native German speakers without prior knowledge.[6]

2.1 Historical and sociolinguistic context

STQ is one of the Frisian languages, which are the closest living relatives to English on the European continent. These languages form the Anglo-Frisian subgroup of West Germanic, whose members are defined mainly by certain common sound changes and lexical items. These will be taken up in 2.2 .

STQ is the last remaining variety of East Frisian. Today, its 1000 to 2000 speakers are mainly concentrated in four villages in the municipality of Saterland (*Seelterlound* in STQ) in the western half of the province of Lower Saxony in Germany. There are very minor dialectal differences between the villages that do not impede mutual intelligibility (Slofstra & Hoekstra 2022:22-3).

The region has traditionally known two dominant languages, Low German, which STQ has been heavily influenced by, and more recently Standard High German. Low German has supplanted the other varieties of East Frisian in much of the area, STQ only having survived because of the historical isolation of Saterland (Slofstra & Hoekstra 2022:12-3). Although there is currently no one standard spelling system for STQ, the language is taught at local schools using a simplified version of the orthography originally developed by Pyt Kramer, which is also used by the municipal government in Saterland. This study, however, aligns with the spelling system used in Marron Fort's dictionary (Fort 1980), mainly for reasons of practicality.[7]

6 This includes three short passages in STQ used for a cloze test (based on Evers 2011), which results I have not obtained in time to include here.

7 This video explains the differences between the spelling systems in existence: https://www.seeltersk.de/archiv/video-ueber-den-saterfriesischen-rechtschreibdschungel/.

2.2 Linguistic features

To reiterate, the purpose of this section is to look at the similarities and differences STQ exhibits to German as represented in my experimental stimuli. This will allow us to make predictions about the transparency of the STQ material to German speakers. As a note, I have also included some words not found in my stimuli for illustrative purposes. These words are marked with a hash sign (#).

2.2.1 General closeness to German

Although in a different subbranch, STQ is, like German, a continental West Germanic language. Therefore, it naturally follows that STQ is very close to German in its syntax, with verb-second order for one, and its lexicon, although as will be expounded on in 2.2.2 , phonological differences often obscure this closeness.

To illustrate the striking syntactic and lexical parallels between STQ and German, (1) is a sentence formed entirely out of cognates shared by both languages, with identical word order:

(1) **The same sentence in Saterland Frisian (a) and German (b) consisting only of cognates**

a. *Bie dän Koopmon häd er jee gans loange oarbeid-ed.*
at ART.MASC.OBL storekeeper had he after.all very long work-PTCP
'After all, he had worked for the storekeeper for a very long time.'

b. *Bei dem Kaufmann hatte er ja ganz lange ge-arbeit-et.*
at ART.MASC.DAT storekeeper had he after.all very long PTCP-work-PTCP

2.2.2 Phonological distance

Many STQ words are phonologically quite close to their German counterparts, as shown below:

Table 2 – Phonologically similar cognates in Saterland Frisian and German

English	Saterland Frisian	German
'tree'	*Boom*	*Baum*
'socks'	*Sokken*	*Socken*
'to adjust'	*anpaasje*	*anpassen*
'to reward'	*biloonje*	*belohnen*
'afraid'	*boang*	*bange*
'creased'	*knitterg*	*knitterig*

Historically, however, both languages have undergone some rather dissimilar sound changes. To begin with, STQ has like English and West Frisian been affected by certain phonological shifts that characterise the North Sea Germanic subgroup of West Germanic (Bremmer 2009):

Table 3 – A sampler of sound shifts shared between English and Frisian (sounds of interest enclosed in angle brackets <>)

	English	**Saterland Frisian**	**West Frisian**	**German**
/g/ > /j/	<y>esterday	*<j>äärsene#*	*<j>uster*	*<g>estern*
	wa<y>	*Wa<i>* (‘road’)	*we<i>*	*We<g>*
unrounding of certain vowels	gr<ee>t	*Gr<äi>t* (‘greeting’)	*gr<oe>t* (Dutch borrowing)	*Gr<u>ß*
	th<i>n	*t<ää>n#*	*t<i>n*	*d<ü>nn*
affricativisation of /k/ before front vowel	<ch>eese	*<S>íes#*	*<ts>iis*	*<K>äse*

Moreover, STQ has been implicated in several sound changes that are highly unusual among the West Germanic languages. These include vowel lengthening, /r/-dropping and ‘plosivisation’ of /r/, as shown in Table 4 contrasted against cognates from West Frisian – which has only partaken of some of these sound shifts, and German, which has not.

Table 4 – Some sound shifts largely unique to Saterland Frisian

Sound shift	**Saterland Frisian**	**West Frisian**	**German**
vowel lengthening (shared with West Frisian)	*H<úu>nd* (‘dog’) – /u:/	*h<û>n* – /u:/	*H<u>nd* - /ʊ/
	W<íe>nd (‘wind’) – /i/	*w<y>n* – /i/	*W<i>nd* – /ɪ/
initial /r/ > /g/ or /ɣ/	*<G>jucht* (‘right(, dish)’) – /g/ ~ /ɣ/	*<r>jocht* – /r/	*<R>echt* – /ʁ/
intervocalic /r/ > /d/ (‘plosivisation’)	*jä<dd>en* (‘gladly’) – /d/	*je<r>n* – ø	*ge<r>n* – /ɐ̯/ ~ /ʁ/
	Bäi<d>en (‘child’) – /d/	*bê<r>n* – ø	--
/r/ before plosive > vowel or ø (manifested differently to West Frisian and German)	*Ä<i>de* (‘earth’) – /ɪ/	*ie<r>de* – ø	*E<r>de* – /ɐ̯/ ~ /ʁ/
	Wo<u>d (‘word’) – /ʊ/	*wu<r>d* – ø	*Wo<r>t* – /ɐ̯/ ~ /ʁ/
	wu<>kkelk (‘really’) – ø	*we<r>klik* – /r/	*wi<r>klich* – /ɐ̯/ ~ /ʁ/
/r/ or /d/ before glide > ø	*F<>jund* (‘friend’) – ø	*f<r>eon* – /r/	*F<r>eund* – /ʁ/
	t<>jo (‘three-MASC’) – ø	*t<r>ije* – /r/	*d<r>ei* – /ʁ/
	<>joop# (‘deep’) – ø	*djip* – /d/	*tief* – /t/
bilabial plosive/ fricative after long front vowel > bilabial glide	*fieu<w>* (’five’) – /w/	*fîi<f>* – /f/	*fün<f>* – /f/
	líeu<w>je# (‘to live’) – /w/	*li<b>je* – /b/	*le<b>en* – /b/
	skeeu<w> (‘crooked’) – /w/	*skee<f>* – /f/	*schie<f>* – /f/

German has likewise undergone certain sound changes not shared by STQ, for instance the (af)fricativisation of stops. The substantial phonological distance separating STQ words from their

German cognates could therefore be reasonably expected to pose a barrier to intelligibility by German speakers.[8]

In designing the stimuli for the experiments to be covered in sections 3 and 4, I have attempted to include a mix of these phonological differences, although it has not been feasible to control for these because of my unfamiliarity with STQ. Therefore, this minor caveat and that in footnote 8 aside, the stimuli would collectively be predicted not to be entirely transparent to the German reader without prior knowledge of STQ.

2.2.3 Orthographic differences

As alluded in to in 2.1 , there is no standard orthography for STQ at present. The Fort spelling system opted for here is largely similar to the German one, with the following notable differences:

- the letter <z> represents the voiced alveolar sibilant /z/, unlike in German, where it indicates the voiceless alveolar affricate /ts/; accordingly, <s> is always unvoiced, unlike in German
- long vowels are doubled in closed syllables, but spelt as a single vowel in open syllables (e.g. *Húus* 'house', *Húus* + *-e* 'plural'→ *Húze* 'houses'); the sole exception is <íe>,which is spelt this way irrespective of context (*Híer* 'a strand of hair', *Híer* + *-e* 'plural' → *Híere* 'hair, collective').

Given cognate recognition through the written medium is highly dependent on what sounds the parser thinks the written letters on the page represent (see footnote 5), we might expect these differences to obscure the relationship between STQ words and their German cognates if the German speakers rely on the German spelling system to guess at how the STQ words are pronounced.

2.2.4 Lexical differences

For this overview, it will be useful to distinguish three groups of non-cognates – the first false friends, the second comprising stems with cognates in English and other North Sea Germanic languages but not German itself and the third stems unique to STQ to the best of my knowledge. In this section, I shall explain why these non-cognates can be predicted not to uniformly impede comprehension.

To begin with, false friends for the purposes of this study are STQ stems that have an etymological equivalent in German but whose semantics has diverged quite significantly from that equivalent. Although studies such as Jágrová (2022:18) have noted that false friends impair intelligibility more than other non-cognates, I here opt to lump them with the other two categories for expediency. Examples include:

8 That said, speakers of regional West Germanic languages – such as Low German – that have not participated in the same sound shifts may experience less of a barrier to comprehending STQ words. However, as the samples in this study are relatively small, this cannot be rigorously tested.

Table 5 – Some false friends in Saterland Frisian and German

Meaning	Saterland Frisian	Resembles German	Translates as German
'broken'	*kuut*	*kurz* ('short')	*kaputt*
'empty'	*loos*	*los*, *lose* ('loose')	*leer*
'to sew'	*säie*	*säen* ('to sow'), *sehen* ('to see')	*stricken*
'wet'	*wäit*	*weit* ('far')	*nass*
'wall'	*Woge*	*Woge* ('billow')	*Welle*

The second group may be more comprehensible to German speakers with a working knowledge of these related languages, English and Dutch foremost of all.

We shall start with cognates to English but not to German, of which STQ has a few. This is unsurprising – recall that STQ is historically more closely related to English than German. However, for the most part, these cognates are phonologically quite far removed from each other:

Table 6 – Words Saterland Frisian shares with English but not German

Saterland Frisian	English cognate	German non-cognate
litje(t)	little	*klein*
Koai	key	*Schlüssel*
säie	to sew	*stricken*
Sleeuwe#	sleeve	*Ärmel*
wäit	wet	*nass*

There are also cognates with Dutch but not German, which are phonologically closer. By some accounts part of this group may be loans from Dutch (cf. Slofstra & Hoekstra 2022:24):

Table 7 – Words Saterland Frisian shares with Dutch but not German

Saterland Frisian	Dutch cognate	German non-cognate
froai ('beautiful')	*fraai*	*schön*
hiere ('to rent')	*huren*	*mieten* (but cf. *anheuern* 'to hire')
mäkkelk ('easy')	*makkelijk*	*leicht*
Takke ('branch')	*tak*	*Ast*
uumdät ('because')	*omdat*	*denn, weil*
wäggooije ('to throw away')	*weggooien*	*wegwerfen, wegschmeißen*

To reiterate, this group of non-cognates with German might not hamper intelligibility to German speakers familiar with those languages where cognates to these stems do exist.

The third group of non-cognates, however, comprises words largely unknown outside of STQ where extant Germanic languages are concerned. Some examples are illustrated in the following:

Table 8 – Words (largely) unique to Saterland Frisian

English	**Saterland Frisian**	**German**
'to speak'	*bale*	*reden*
'to say' (cf. 'to bequeath')	*kwede**	*sagen*
'to fertilise'	*mjuksje*	*düngen*
'to give'	*reke***	*geben*
'oneself'	*säärm#*	*selbst*
'to cook' (cf. 'to seethe')	*sjode***	*kochen*
'knife'	*Soaks* ^	*Messer*
'basket'	*Täine**	*Korb*

* These lexemes may have cognates in non-German varieties of Upper German.

** These items are cognate to semantically distinct German terms (*reichen* 'to pass sth. to someone' and *sieden* 'to boil' respectively) and the latter has a direct cognate in West Frisian (*siede* 'to cook').

^ This term has a cognate that means 'scissors' in the North Germanic languages and is also a historical term in German referring to a sword used by the ancient Saxons.

These will be expected to impede intelligibility to German speakers who do not know STQ.

2.2.5 Other miscellaneous differences

In this final part of section 2, I will compare the morphological and syntactic features of STQ and German. While not the focus of this study, a few remarks are in order as these bear on the comprehensibility of my stimuli.

Where verbs are concerned, the two STQ infinitival suffixes are perhaps the most conspicuous in their outward difference to their one German equivalent, the suffix *-en*. Which STQ ending is used is largely decided based on two factors – the first is verb class (*-e* or *-je*) and the second whether the verb appears as a to-infinitive or a bare infinitive (determines whether a further *-n* is added to the end of the infinitival verb). Past participle forms in STQ also take only a suffix (see *oarbaid-ed* work-PTCP 'to have worked' in (1)), whereas those in German generally take both a prefix and a suffix (*ge-arbeit-et* PTCP-work-PTCP 'IDEM').

Another locus of morphological differences between both languages is the simplified case system in STQ, with oblique case only marked on pronouns and the masculine definite article there. By contrast, German distinguishes four cases – as opposed to the two in STQ – on pronouns and most articles. However, these morphological differences arguably pale in comparison to the phonological ones described in 2.2.2 .

Additionally, in the light of my observation that STQ syntax is in most respects identical to German, where the positions of verbs and nominal arguments are fixed in canonical word order, the word class and thematic role of verbs and nouns should be inferable from their position in a sentence.

To sum up the above, the STQ cognates that will be used in my stimuli are sufficiently far removed from their German counterparts phonologically to not be fully transparent to a German speaker, although these and certain non-cognates may be slightly more intelligible to German speakers with knowledge of other related West Germanic languages such as Dutch, English and Low German.

3 Preliminary experiments

3.1 Design and predictions

The main experiment, to be described in section 4, rests on two main assumptions – firstly, that a context that comprises cognates is substantially more intelligible than a context comprising non-cognates and secondly, that cognate words are more intelligible than non-cognates in sentences, just as they are in isolation. The two preliminary experiments to be outlined in this section will test these assumptions in turn.

As mentioned in 1.3 , the greater intelligibility of cognates as compared to non-cognates has mostly only been systematically investigated with cognates presented in isolation. One notable exception is Gooskens & Swarte (2017:138), who find the number of non-cognates ('lexical distance' in their terms) to be the only linguistic predictor that contributes significantly to overall text intelligibility in Germanic languages. Jágrová (2022:199) likewise observes that the number of non-cognates is a good predictor of sentence intelligibility in Polish. However, neither study explicitly controlled for the syntactic position or contextual salience of non-cognates. Hence, for the purposes of the present study, we need to ascertain in a principled fashion that the facilitation effect of cognates not only applies in isolation but also carries over into texts.

With this in mind, my first experiment tests whether contextually important cognates and non-cognates in comparable syntactic positions within a sentence affect sentence intelligibility differently. If cognates improve sentence intelligibility, a context containing semantically important cognates would be more intelligible than a context containing non-cognates. This will serve to establish to what extent the presence of cognates in the surrounding context can be used as a predictor of and indeed proxy for context intelligibility.

The second experiment then determines whether a fully intelligible context would allow cognates to be as easily identifiable as non-cognates. This is important in order to ascertain if context intelligibility diminishes the effect of cognacy on the intelligibility of a target word, and whether in the main experiment target cognacy should be included as a predictor in its own right alongside context intelligibility.

I will now proceed to describe each experiment in more detail.

3.1.1 Experiment 1 – Intelligibility of sentences with vs without cognates

The objective of this experiment is to find out if sentences containing cognates are more intelligible than those containing non-cognates, assuming the contextual salience and syntactic positions of both are identical.

This set-up required participants to fill in a missing word in a STQ sentence by selecting one of the four STQ words supplied. There was only one logically correct answer to each question and for each question, two options were cognates and the other two were non-cognates. Which option was the correct one could be made out from exactly two other words around the blank – to ensure that this was the case, contexts were made as predictable as possible, with no unexpected twists.[9] I shall term the missing word in each sentence the target word (or 'target' for short) and the two other contextually important words the context words (or 'context' for short).

In order to arrive at the correct response, one would need to understand both the context words and the target word. Only being able to understand one of these (i.e. the target but not the context or the context but not the target) would not reliably lead one to the correct answer. Therefore, the number of correct responses per participant and condition is a good gauge of sentence intelligibility.

Where my stimuli were concerned, all sentences were phrased according to the template <I – MODAL VERB – OBJECT – TRANSITIVE VERB – BECAUSE – OBJECT – ADJECTIVE – COPULA>. The following is a translated example of one such sentence:

(2) **Example sentence from stimuli for Experiment 1 illustrating structure used**

I | MODAL VERB | OBJECT | TRANSITIVE VERB | BECAUSE | OBJECT | ADJECTIVE | COPULA

Iek	*mout*	*t Húus*	*aprüme,*	*uumdät*	*et*	*uunoantelk*	*is.*
I	must	ART.NEUT house	tidy.up-INF	because	it	untidy	is

'I need to tidy up the house because it is untidy.'

Sentences were designed varying two conditions – cognacy of the target word and cognacy of the context words, as shown in Table 9. However, for reasons to be explained in 3.3.1 , only conditions I (cognate target, cognate context) and III (non-cognate target, non-cognate context), making up half the stimuli, were considered for analysis; the other half was discarded:

Table 9 – The four groups of stimuli used in Experiment 1, representing all combinations of the predictor variables target cognacy and context intelligibility (cognate terms are underlined)

Variables	CONTEXT INTELLIGIBILITY – do both context words have cognates in German?	
	Y	**N**

9 It was impossible to pre-test the predictability of each target word in as dedicated a way as discussed in Jágrová (2022:166-7) due to practical limitations. I would not have been able to use findings from those earlier studies she draws on (Bloom & Fischler 1980, Block & Baldwin 2010) as my stimuli control for different factors, most notably cognacy and sentence structure, which was not the case in the works cited.

TARGET COGNACY – does the target word have a German cognate?	**Y**	GROUP I *context target context*	GROUP III *context target context*
	N	GROUP II *context target context*	GROUP IV *context target context*

Different sentences had the missing word – i.e. the blank to be filled in – in different positions. Eight sentences had a missing noun, eight a missing adjective and a further four a missing verb, equally split between the four conditions shown in Table 9:

Table 10 – Examples of missing words of different classes, with the condition (i.e. group) their containing sentence represents indicated underneath

Example sentence with blank	Missing word	Class of missing word
Iek mout t Húus aprüme, uumdät t ___ is. ('I need to tidy up the house because it is untidy.') – GROUP I	*uunoantelk* ('untidy')	adjective
Iek wol ju ___ klöärje, uumdät ze roar is. ('I want to paint the wall because it is ugly.') – GROUP IV	*Woge* ('wall')	noun
Iek mout ju Gräid ___, uumdät ze soor is. ('I need to fertilise the lawn because it is barren.') – GROUP IV	*mjuksje* ('to apply fertiliser')	verb

As stated above, for each sentence two cognate options and two non-cognate ones were provided. For the first sentence in Table 10, the options were, in alphabetical order and with cognates to German underlined, *uunoantelk* ('untidy'), *uuntjudelk* ('unclear'), *uunferfierd* ('fearless') and *uunmis* ('completely wrong').

Going by the literature named in 3.1 , we would predict that cognates should make sentences more intelligible than non-cognates, with their syntactic position and contextual importance held constant.

3.1.2 Experiment 2 – Cognate intelligibility in transparent context

The objective of this set-up is to find out whether target word cognacy plays a role in target word intelligibility when the context is fully transparent. Findings here will inform the design of the main experiment, to be discussed in section 4. As mentioned in 1.3.1 and 3.1 , this is necessary to find out if cognates are more readily identifiable than non-cognates regardless of whether they are in isolation or presented in context.

If a fully transparent context makes both cognates and non-cognates equally intelligible, we could infer that target word cognacy is overshadowed by context intelligibility as a predictor for target word intelligibility, whence it might be advisable not to include target word cognacy as a predictor variable in the main experiment. However, if cognates and non-cognates in a transparent context are not equally intelligible, this would mean that target word cognacy exerts an influence on target

word intelligibility independent of context intelligibility, making a case for its inclusion as a predictor variable.

The experiment asked participants to select the correct STQ word to complete one blank in a German sentence. The stimuli and options supplied were otherwise identical to experiment 1. In contrast to that experiment, the context words being in German here makes them transparent, whence participants only needed to understand the STQ target words supplied in order to answer each question correctly.

Different sentences had the missing word – i.e. the blank to be filled in – in different positions. Eight sentences had a missing noun, eight a missing adjective and a further four a missing verb, each group equally split between the cognate and non-cognate conditions.

If cognates are more intelligible than non-cognates both in isolation and in context, for this experiment we would expect higher accuracy of responses when the target word is a cognate as compared to when it is a non-cognate.

3.2 Implementation

3.2.1 Format

Both experiments were combined into one Google Forms questionnaire, and responses were collected from December 2023 to early January 2024.

As each experiment was contained in a separate section of the form, participants needed to complete experiment 1 before they could navigate to experiment 2. The rationale for this was that going through the experiments in the other sequence would have meant providing participants the German translations of the STQ stimuli in experiment 2. That would have made the STQ stimuli more intelligible than otherwise.

Also, while different groups of people should ideally have been recruited for each experiment, that was not possible in this case given time and logistical constraints.

Participants were asked for their age, native languages aside from German, foreign languages spoken at least at level B1 according to the Common European Framework of Reference for Languages.

3.2.2 Participants

14 native German speakers from Germany were recruited using the snowballing method. Most of them were people I knew personally. None of these participants had had any prior exposure to or knowledge of STQ.[10]

All were university graduates, with 42.8% (n = 6) having had a degree in linguistics. Their ages ranged from 23 to 65, with the median age being 30.

10 This section only summarises those points pertinent to the analysis.

In terms of knowledge of languages closely allied to STQ, two participants spoke Low German natively and two Bavarian. All knew English as a foreign language, while four had at least rudimentary non-native skills in Dutch.

3.2.3 Data processing

This subsection will briefly go through how I treated the data collected. I shall start by explaining which of the responses were excluded from analysis.

Firstly, two participants provided anomalous responses, which were not considered – the participants in question correctly identified most non-cognates but did not recognise most cognates, which is completely unexpected in the light of the literature review in 1.3.1 . This left only 12 participants in the dataset used for analysis.

In addition, certain non-cognate target words approached cognates in their intelligibility due to participants having recognised those words as cognate to stems in either English or Dutch. As predicted in 2.2.4 , Dutch cognates were especially recognisable, according to participants who knew Dutch, most of them remarking in feedback collected informally after the experiment that STQ was very similar to that language. Two stimuli containing such Dutch cognates were therefore entirely excluded from analysis so as not to blur the distinction between the cognate and non-cognate conditions. English cognates were less identifiable and therefore retained.

Data for the remaining participants and stimuli was converted into tidy format, i.e. each response to every individual question was taken as one data point. A total of 456 data points (12 participants times 38 questions) were considered after excluding the participants and stimuli named above. The following section will describe and attempt to interpret the results of the experiments.

3.3 Findings

3.3.1 Experiment 1

Recall my prediction in 3.1.1 that when syntactic position, contextual salience and word class are controlled for, cognates would facilitate sentence intelligibility more than non-cognates.

The results bear out the prediction. I ran a generalised linear mixed-effects regression (GLME) model on the data, with response as the binary outcome and the composite variable ‘group’ – a combination of target cognacy and context intelligibility – as the sole binary predictor, also including the random effects of subject and of group by subject. This revealed that participants were 3.82 times ($e^{1.34}$, standard error of log odds = 0.647, $z = 2.69$, $p < 0.05$) as likely to answer questions correctly where all words of interest were cognates (group I), compared to those questions where these words were non-cognates (group IV).

In other words, controlling for the aforementioned factors, cognacy is a reliable marker of sentence intelligibility and for the purposes of the main experiment, contexts comprising cognates would be more intelligible than contexts comprising non-cognates.[11]

3.3.2 Experiment 2

The results of this experiment support the hypothesis stated in 3.1.2 that target word cognacy is a significant factor affecting target word intelligibility. This effect is independent of context intelligibility and holds whether target words appear in isolation – as confirmed by the literature cited in the foregoing – or in a context, as was the case in this experiment.

I ran a GLME model with response as the binary outcome variable and target cognacy as the (binary) predictor, including the random effects of subject and of target cognacy by subject. This showed that participants were 11.4 times ($e^{2.44}$, standard error of log odds = 0.58, z = 4.20, $p < 0.001$) as likely to provide the correct answer when the target word was a cognate compared to when it was a non-cognate. These significant results confirm that it would be feasible to include both target word cognacy and context intelligibility (i.e. cognacy of both context words) as predictor variables in the main experiment.

4 Main experiment

4.1 Method

As a reminder, my findings for the two experiments detailed in section 3 clearly demonstrated two points – one, that sentences comprising (contextually salient) cognates are significantly more intelligible than sentences comprising non-cognates and two, that target word cognacy improves target word intelligibility whether or not the target word is contextualised.

Building on these insights, this experiment will address each of my two research questions in turn. I start with the first, pertaining to whether context intelligibility affects the intelligibility of target words in general. Taking into account the findings of Experiment 1 (3.3.1), I simplistically take a context comprising cognates to be intelligible, and one comprising non-cognates as unintelligible. The experiment will hence test if words are more readily identifiable when presented in an intelligible context as opposed to a non-intelligible context, i.e. one without any cognates. Now to the second question about how cognacy and context intelligibility interact in influencing word intelligibility, this experiment will also investigate whether context intelligibility has a differential effect on the transparency of cognate target words as opposed to non-cognates.

11 Experiment 1 originally intended to test the influence of surrounding cognates – i.e. cognacy of context words – on how well participants could identify cognate target words. However, it later became clear that the multiple-choice format of this experiment required participants to not only understand the target words, but also the surrounding context in order to select the correct target word. Failure to understand either target or context would result in accuracy at chance level. This meant that, as mentioned above, what was tested in this set-up was full comprehension of the sentences, not the identifiability of cognate target words.

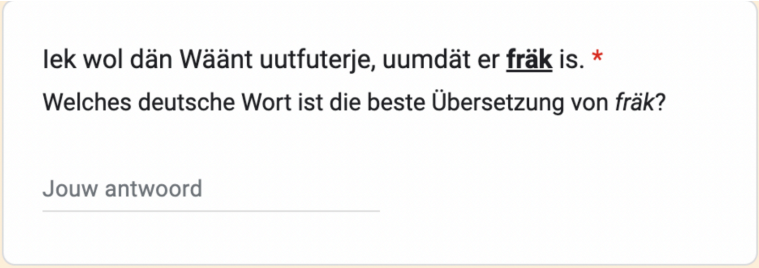
4.1.1 Design

This experiment was a word translation task. It was designed such that participants were only required to identify the target word correctly in order to derive the correct answer to the question.

The stimuli used for this experiment were largely the same as for Experiment 1, the chief difference being that all target words were left in their sentence and participants were asked to key in the German word that best corresponds to it in meaning instead of selecting the correct answer from a list of options. Cognate target words were selected to not be phonologically too close to their German equivalents, although no principled way of measuring their phonological distance was used here as my unfamiliarity with STQ would have made it unfeasible to select target words based on their Levenshtein distance to their German cognates.

Figure 1 shows a screenshot of a question as participants saw it in the Google Form (more details in the next section), with the target word in bold and underlined, and a prompt below each question asking for the best translation of the target word to be keyed into the field provided.

Figure 1 – A sample question from the online questionnaire used for the main experiment



For ease of reference, Table 9 is repeated as Table 11, as the same factors were controlled for in this experiment as in Experiment 1:

Table 11 – The four groups of stimuli used in the main experiment, representing all combinations of the predictor variables target cognacy and context intelligibility (cognate terms are underlined)

Variables		CONTEXT INTELLIGIBILITY – do both context words have cognates in German?	
		Y	**N**
TARGET COGNACY – does the target word have a German cognate?	**Y**	GROUP I *context target context*	GROUP III *context target context*
	N	GROUP II *context target context*	GROUP IV *context target context*

Unlike Experiment 1, stimuli for all four conditions were considered in the analysis. The number of stimuli was likewise increased from 20 to 24, with six items in each of the four conditions. This balanced out the number of target adjectives, nouns and verbs, with two each per condition.

Table 12 – Number of missing words of each class by condition in the main experiment

Missing word	GROUP			
	I	II	III	IV
Adjectives	2	2	2	2
Nouns	2	2	2	2
Verbs	2	2	2	2

In addition, problematic stimuli from Experiment 1 were removed where non-cognates were as easily identifiable as cognates due to the context being overly predictable and/ or participants knowing languages other than German with which STQ shared these non-cognate stems.

4.1.2 Predictions

I will start with how context affects the transparency of phonologically divergent cognates. In line with my contention outlined at the start of the paper, we would predict an intelligible context to improve cognate intelligibility as compared to a non-intelligible context. This would mean in other words that phonological distance can only be overcome by an intelligible context.

With non-cognates, an intelligible context should similarly increase their intelligibility. This would tie in with Jágrová's (2022) finding that contextualising non-cognates improves their transparency. However, the evidence is not conclusive as to whether an intelligible context would improve the transparency of non-cognates more or less than that of cognates. Jágrová's model (2022), as stated in 1.3.3 , seems to suggest a much larger improvement in non-cognate transparency as compared to cognates. Nevertheless, as also mentioned above, she did not control for context intelligibility or syntactic structure, whence it is not entirely certain if her findings are reliable. On the other hand, in Experiment 2 (see 3.3.2), I demonstrated there that given a transparent context, non-cognates are significantly less identifiable than cognates. Judging from this, we would predict an intelligible context to improve the transparency of non-cognates *less* than that of cognates.

4.1.3 Participants

The experiment was implemented via Google Forms in February 2024 and responses were collected from 24 native German speakers. Collectively, they grew up in 11 different German states, i.e. all but Bremen, Hamburg, Mecklenburg-Western Pomerania, Saarland and Thuringia. Their ages ranged from 20 to 84 years old, with the median being 28.5.

Relevant native languages included Bavarian, English and Ripuarian German. In terms of foreign languages, all but one knew English, one reported knowledge of Dutch and yet another knowledge of Danish.

Compared to Experiments 1 and 2, a much smaller proportion of participants, 16.7%, had a linguistics degree, largely due to my having relied on secondary contacts for this experiment.

All but 2 participants had no knowledge of the existence of Saterland Frisian, and unsurprisingly they all had neutral to slightly positive attitudes towards the language.

4.1.4 Data processing

There were no problematic responses for this experiment, hence data from all stimuli and all 24 participants was retained for analysis. This made for a total of 576 data points (24 questions times 24 participants).

The raw responses collected were strings, as participants had been given a field to key in their one-word answers. Prior to analysis, all these responses were replaced by zeros ('incorrect') and ones ('correct'). For simplicity, there was no separate score for partially correct responses – most were considered incorrect. Some participants gave multiple answers despite the instructions discouraging that – these were marked correct so long as one of the answers was correct. (Which responses were accepted and which were not is shown in the Appendix.)

Near-synonyms of correct answers were marked correct, even though they did not always contain the stem cognate to the STQ target word sought by the question. As shown in Table 13, an example of such a response was *pflücken* ('to pluck'), semantically very close to *ernten* ('to harvest'), the German cognate of the STQ target word in the sentence, *adenje* ('to harvest'):

Table 13 – Accepted responses to a group I sentence in the main experiment

Saterland Frisian sentence	**Target word**	**Target translation**	**Acceptable alternative**
*Iek mout do Apele **adenje**, uumdät ze riep sunt.* ('I need to harvest the apples because they are ripe.')	*adenje* ('to harvest')	*ernten* (IDEM)	*pflücken* ('to pluck, pick')

Conversely, responses that contained the stem being sought but that did not correspond to the correct answer semantically were labelled incorrect. Examples include:

Table 14 – Responses marked incorrect to two group III sentences in the main experiment

Saterland Frisian sentence	**Target word**	**Target translation**	**Incorrect responses**
*Iek wol dussen Fänt **undläite**, uumdät er ööazig is.* ('I want to sack this guy because he is off-putting.')	*undläite* ('to fire someone')	*entlassen* (IDEM)	*ablassen* ('to drain off'), *auslassen* ('to let out')
*Iek wol do Takken binoaderje, uumdät ze **oustúurven** sunt.* ('I want to prune the branches because they are dead.')	*oustúurven* ('dead, withered away')	*abgestorben* (IDEM)	*ausgestorben* ('extinct')

See the Appendix for a full list of responses to this experiment.

4.2 Findings

This subsection will address the predictions made in 4.1.2 , starting with assessing the significance of context intelligibility as a predictor variable, then moving on to a closer look at how it interacts with cognacy to determine word intelligibility.

4.2.1 Context intelligibility influences word intelligibility

The data reveals an intelligible context to have made it significantly more likely for participants to translate the target word correctly. This is concrete evidence that context intelligibility – as measured by whether the context contains cognates – influences word intelligibility.[12]

Also, as expected given the results to Experiment 2 in 3.3.2 , target cognacy likewise brought about a similar significant effect.

Using backward model selection, a GLME model was arrived at with the predictor variables target cognacy and context intelligibility as main effects on the binary outcome variable response accuracy alongside the random effects of subject and of target cognacy and context intelligibility by subject.

As mentioned, both target cognacy and context intelligibility had a significant influence on response accuracy. A cognate target word was 4.33 times ($e^{1.47}$) as likely as a non-cognate target word to be correctly translated, assuming context intelligibility was held constant ($z = 4.06$, $p < 0.001$). Likewise, an intelligible context was 7.14 times ($e^{1.97}$) as likely as a non-intelligible context to result in a target word being correctly translated, holding target cognacy constant ($z = 5.08$, $p < 0.001$).[13]

Table 15 – Coefficients of fixed effects of both predictors in GLME model for all data from main experiment

Fixed effects	Estimate	Standard error	z value	Pr(>|z|)
(Intercept)	-2.9546	0.2878	--	--
Cognate target	1.4660	0.2280	6.429	< 0.00001 ***
Intelligible context	1.9659	0.2498	7.869	< 0.00001 ***

This implies that target cognacy and context intelligibility both significantly increased the chance of participants translating target words correctly, regardless of whether the latter were cognate or non-cognate.

12 While this variable was encoded as 'context cognacy' in my data, I will refer to it as 'context intelligibility' here to be consistent with the rest of the paper.

13 The interaction between both predictor variables was left out because the Bayesian Information Criterion (BIC) of the model including the interaction was higher (BIC = 603.7) than the less complex one without (BIC = 598.7), and the interaction did not prove significant in any case ($z = -1.11$, $p > 0.2$). I will, however, take up the issue of interaction in 4.2.2 . Random slopes for the effect of target cognacy and context intelligibility by subject were also included as each subject was exposed to all four conditions. However, I excluded the correlation between these predictor variables and subject. Although not ideal, this was the largest model that converged given the limited size of my dataset.

An example for which a predictable and intelligible cognate context facilitated the correct interpretation of a non-cognate target word is in (3), with the non-cognate target word *Soaks* (‘knife’) and the cognate context words *sliepe* (‘to whet’) and *stump* (‘blunt’):

(3)	*Iek*	*wol*	*dät*	***Soaks***	*sliepe,*	*uumdät*	*et*	*stump*	*is*
	I	want	ART.NEUT	knife	whet	because	it	blunt	is

‘I want to sharpen the knife because it is blunt.’

For this item, both context words are semantically closely associated with the target word, 9 of 24 participants correctly translated *Soaks* as ‘knife’, while a further 5 supplied answers semantically related to the context. These were namely ‘axe’ (G. *Axt*), ‘saw’ (*Säge*), ‘scissors’ (*Schere*) and ‘sword’ (*Schwert*).[14]

The next subsection will show that non-cognate targets are influenced by context intelligibility to a greater degree than cognate targets.

4.2.2 Context intelligibility affects non-cognate target words more than cognate ones

Recall that in 4.1.2 I was unable to confidently predict if an intelligible context would improve the transparency of cognates more or less than that of non-cognates. The results unequivocally replicate Jágrová’s (2022) findings, i.e. that context intelligibility improves the transparency of non-cognate targets much more than cognate targets.

Sections 2.2 to 4.1.1 explained that my stimuli were designed such that a considerable phonological distance separated most words represented there from their German cognates. In order to see to what extent context intelligibility improved intelligibility of cognate target words in particular, I ran a second GLME model on data from conditions I (cognate target and cognate context) and III (cognate target and non-cognate context). Here, the main predictor was context intelligibility, with the random effects of subject and context intelligibility by subject.

The model found that an intelligible context contributed to a significantly improved response accuracy rate. Having cognate context words around a cognate target word improved the latter’s intelligibility by a factor of 5.62 ($e^{1.7259}$, $z = 6.17$, $p < 0.0001$) according to the model as compared to when the context comprised non-cognate words:

Table 16 – Coefficient of fixed effect of intelligible context in GLME model for stimuli with cognate target (i.e. groups I and III) in main experiment

Fixed effects	**Estimate**	**Standard error**	**z value**	**Pr(>|z|)**
(Intercept)	-1.3463	0.2355	--	--
Intelligible context	1.7259	0.2798	6.169	< 0.00001 ***

14 As mentioned in 4.1.4 , no partial marks were awarded for this experiment, whence these alternative answers were all labelled incorrect.

With non-cognate target words, it is a similar story, only that an intelligible context improved their intelligibility by a much greater factor. Running yet another GLME model on the other half of the data – conditions II (non-cognate target and cognate context) and IV (non-cognate target and non-cognate context) – revealed that non-cognates in an intelligible context were 13.1 times ($e^{2.5732}$, $z = 6.17$, $p < 0.001$) as likely as those in a non-intelligible context to be correctly translated. The predictor for this model was again context intelligibility, with the random effects of subject and context intelligibility by subject:

Table 17 – Coefficient of fixed effect of intelligible context in GLME model for stimuli with non-cognate target (i.e. groups II and IV) in main experiment

Fixed effects	Estimate	Standard error	z value	Pr(>|z|)
(Intercept)	-3.4958	0.6680	--	--
Intelligible context	2.5732	0.6713	3.833	< 0.001 ***

The same difference is manifested in the mean improvement in accuracy across the four conditions. Here, the main comparison will be between conditions I/ III, where the target word is a cognate, and conditions II/ IV, where the target is a non-cognate. For cognate targets, we see an improvement in mean accuracy of around 174% when they are in an intelligible context (group I, 59%) as opposed to a non-intelligible one (group III, 21.5%). This pales against the much larger improvement for non-cognate targets, with the mean accuracy for non-cognates in an intelligible context (group II, 30.6%) seven times, i.e. 700%, that of non-cognates in a non-intelligible context (group IV, 4.2%). This is logical given that non-cognate target words become intelligible to a certain degree when embedded in a cognate context, while non-cognates surrounded by a non-cognate context are barely intelligible.

Therefore, although footnote 13 mentions that the interaction between the predictor variables context intelligibility and target cognacy did not turn out significant in my GLME model, I have presented considerable evidence to suggest that this may be due to sampling error.

4.2.3 Context intelligibility more important than target cognacy to word intelligibility

In the light of the foregoing, I will now proceed to make explicit a point clearly visible in Table 15, that the coefficient for ‘intelligible context’ (1.9659) is higher than that of ‘cognate target’ (1.4660). This means, simply put, that context intelligibility has a substantially more visible effect on intelligibility of the target word than cognacy of the target word itself.

Indeed, this can be partly accounted for by how as mentioned in 4.2.1 an intelligible context does not only improve the intelligibility of cognates but also makes non-cognates more transparent, the proviso being that the context in question is a predictable one.

However, beyond that, non-cognate targets in an intelligible context are surprisingly more transparent than cognate targets in a non-intelligible context.

This is seen from the palpable disparity in mean accuracy rates between conditions II (non-cognate target, cognate context) and III (cognate target, non-cognate context), which were 30.6% (1.83 of 6 questions) and 21.5% (1.29 of 6 questions) respectively. Although the difference in response accuracy between both conditions did not turn out significant, this nonetheless makes an incontrovertible case for context intelligibility as a key determinant of word intelligibility.

5 The importance of an intelligible context

This section will theorise about how context intelligibility affects word intelligibility and subsequently explain how the findings laid out in the foregoing pertain to the literature.

To reiterate, assuming a predictable context, my experiments have shown word intelligibility in an unfamiliar language to be jointly determined by two factors, intelligibility of the context and word cognacy, the former to a greater extent than the latter. As the role of word cognacy is relatively well documented (see sources cited in 1.3), my exposition here will focus exclusively on how context intelligibility acts on word intelligibility.

I submit that an intelligible context narrows down the range of possible meanings that any given word in a text written in an unfamiliar language could have. If the word in question has a cognate in the parser's L1, this whittling down of possible translations could make it easier to match the word to its cognate by the process of abduction mentioned in 1.3.2 .

The sentence named in Table 13 (4.1.4), repeated as (4), is a prime example of this.

(4) *Iek mout do Apele **adenje**, uumdät ze riep sunt.*

I must ART.PL apples harvest because they ripe are

'I need to harvest the apples because they are ripe.'

In (4), the target word is *adenje* ('to harvest'), cognate to but phonologically rather distant from German *ernten* (IDEM). The context words are the cognates *Apele* ('apples') and *riep* ('ripe'). As touched on above, the range of answers included the German equivalents of 'to harvest' (*ernten*, 13 of 24 responses) and 'to pick' (*pflücken*, 2), but also related verbs like 'to eat' (*essen*, 2), 'to cut' (*schneiden*, 1) and 'to take a bite of' (*anbeißen*, 1). Although it is impossible to know for sure what was going through their minds when they were answering the question, the fact that so many participants (19 of 24) translated the target word with a verb semantically compatible with the context words 'apples' and 'ripe' is positive evidence for the narrowing of the search space.

With non-cognates, an intelligible context similarly reduces the list of possible candidates. However, being a non-cognate, the target word is not amenable to abduction, whence the search space could not be shrunk as much as with cognates. A good example is (3), repeated as (5):

(5) *Iek wol dät **Soaks** sliepe, uumdät et stump is*

I want ART.NEUT knife whet because it blunt is

'I want to sharpen the knife because it is blunt.'

Despite the target word being the non-cognate *Soaks* ('knife'), most participants (14 of 24) provided translations that had semantics roughly corresponding to 'a sharp tool or weapon', as suggested by the context words *sliepe* 'to whet' and *stump* 'blunt'. However, assumedly due to the unavailability

of abduction as a strategy here, fewer participants were able to supply a correct answer (9) as compared to the cognate example above (15).[15]

Having shown how significant an impact context intelligibility – as determined by whether the context contains cognates – has on word intelligibility, we could now revisit Jágrová (2022), a study exploring the effect of contextualisation on word intelligibility that I cited extensively above.

Recall that she also found the number of non-cognates in a sentence to be a strong predictor of target word intelligibility when target words were contextualised. My Experiment 1 having demonstrated a direct link between the presence of (non-)cognates and intelligibility, we could reinterpret the significant effect in her study as having in fact been brought about by context intelligibility. This implies that my findings on context not only apply to STQ and German, but can equally generalise to the morphologically much more complex West Slavonic languages.

By controlling for syntax and contextual importance and treating target cognacy and context cognacy as separate variables, my study has also made clear that the lexical distance of target word and context actively influence one another in determining word intelligibility (see 4.2.2), thereby nuancing our understanding of how lexical distance affects comprehension.

I contend that it is exactly such considerations of interaction between predictors that could account for the anomalous findings in Stenger & Avgustinova (2021:7). Recall from 1.3.4 how that study reported lexical distance to be barely correlated with response accuracy, contrary to much of the cited literature. Although it is unclear how the authors modelled their data, a likely explanation for that is in that study, lexical distance was concurrently included alongside Levenshtein distance as a predictor of intelligibility. Given its authors state that Levenshtein distance was meant as a gauge of orthographic and morphological distance (ibid:4), which is directly affected by and therefore strongly correlated with lexical distance (i.e. cognacy), we would not expect both predictor variables to be significant at the same time. The consensus in the literature that lexical distance is a key predictor of intelligibility, confirmed by the findings in the foregoing, should therefore still be taken to hold.

Nonetheless, the picture painted by the present study is necessarily incomplete, as it is underpinned by a number of simplistic assumptions that were made owing to constraints of a practical nature. Foremost among these is its exclusive focus on cognacy of the target word and intelligibility of the surrounding context as predictors of word intelligibility. As the brief literature review in 1.3 and this section have shown, what determines word intelligibility is in fact a whole nuanced range of distinct, albeit closely related, variables.

With this in mind, further research ought to break target cognacy down into multiple variables in order to avoid conflating the linguistic distance of stems and affixes, as recommended by Heeringa et al. (2014). The focus being on mutual intelligibility in the synchronic dimension, ‘cognacy’ of both the target and surrounding words could moreover be replaced by more precise, synchronically oriented, measures of linguistic distance that would be controlled for in the stimuli. Likewise, context intelligibility should not be interpreted as fully synonymous with ‘cognacy of surrounding

15 Testament to the importance of abduction as claimed by 1.3.2 is the fact that a small minority of participants (3 of 24) still attempted to apply abduction anyway, translating the target word with the phonologically similar *Socke(n)* (‘socks’).

words'. Instead, it would ideally also take into account syntax, given as in the real word, where sentence structure cannot be controlled for, syntactic factors would be almost certain to play a role in context intelligibility as well. Comparing these predictors in a way similar to what Golubovic (2016:53-4) does for her six Slavonic languages would be necessary to do justice to the underlying complexity of word intelligibility as a linguistic phenomenon.

6 Concluding remarks

In the foregoing study, I presented three experiments that investigated word intelligibility in context. Its main contribution consists in teasing apart the cognacy of words in the surrounding context from the cognacy of the word whose intelligibility is being investigated, separately exploring how they affect word intelligibility.

By so doing, I demonstrated that the cognacy of context words was considerably more important to word intelligibility than the cognacy of the target word itself. This affirms the importance of lexical distance (i.e. the number of non-cognate words) as a predictor of sentence intelligibility, as has been widely reported in the literature. Adducing experimental evidence to (simplistically) equate cognacy of surrounding words to context intelligibility, I argue that context intelligibility is an important determinant of word intelligibility alongside context predictability and word cognacy, the latter two factors already identified in earlier research.

Finally, this study controlling for extraneous factors such as the syntactic positions and contextual importance of words of interest has also revealed that context intelligibility and word cognacy interact as predictors to a degree which, while it did not meet the threshold for significance here, may yet be shown to be important to deepening our understanding of how exactly the various factors named above collectively determine word intelligibility.

References

Berthele, R. (2011). On abduction in receptive multilingualism. Evidence from cognate guessing tasks. In L. Wei (ed.), *Applied linguistics review* (2nd ed., pp. 191-220). Berlin, New York: De Gruyter.

Block, C. K., & Baldwin, C. L. (2010). Cloze probability and completion norms for 498 sentences: Behavioral and neural validation using event-related potentials. *Behavior Research Methods*, 42(3), 665-70.

Bloom, P. A., & Fischler, I. (1980). Completion norms for 329 sentence contexts. *Memory & Cognition*, 8(6), 631-42.

Bremmer, R. H. Jr. (2009). *An introduction to Old Frisian. History, grammar, reader, glossary*. Amsterdam/ Philadelphia: John Benjamins.

Dijkstra, T. et al. (2010). How cross-language similarity and task demands affect cognate recognition. *Journal of Memory and Language*, 62(3), 284–301.

Evers, J. (2011). *Friesischer Sprachkurs Seeltersk*. Arbeitskreis Saterfriesisch.

Fort, M. C. (1980). *Saterfriesisches Wörterbuch mit einer grammatischen Übersicht*. Hamburg: Helmut Buske.

Golubovic, J. (2016). *Mutual intelligibility in the Slavic language area*. PhD dissertation, University of Groningen.

Gooskens, C., & Swarte, F. (2017). Linguistic and extra-linguistic predictors of mutual intelligibility between Germanic languages. *Nordic Journal of Linguistics*, 40(2), 123–147.

Hall, C. J. (2002). The automatic cognate form assumption: Evidence for the parasitic model of vocabulary development. *International Review of Applied Linguistics in Language Teaching*, 40, 69–87.

Heeringa, W. et al. (2014). Modeling intelligibility of written Germanic languages: Do we need to distinguish between orthographic stem and affix variation? *Journal of Germanic Linguistics*, 26(4), 361-394.

Jágrová, K. (2022). *Reading Polish with Czech Eyes: Distance and Surprisal in Quantitative, Qualitative, and Error Analyses of Intelligibility*. PhD dissertation, Saarland University Press.

Otwinowska, A., & Szewczyk, J. M. (2019). The more similar the better? Factors in learning cognates, false cognates and non-cognate words. *International Journal of Bilingual Education and Bilingualism*, 22(8), 974-991.

Seeltersk-Kontoor. (2022). *Meedelengen fon't Seeltersk-Kontoor*. Retrieved from https://seeltersk.de, retrieved on 30 March 2024.

Slofstra & Hoekstra (2022). *Sprachlehre des Saterfriesischen 2022-2023*. Niedersächsisches Ministerium für Wissenschaft und Kultur, a.o.

Stenger, I., & Avgustinova, T. (2021). On Slavic cognate recognition in context. *Dialogue*.

Swarte, F., & Hilton, N. H. (2013). Mutual intelligibility between speakers of North and West Frisian. In C. Gooskens & R. van Bezooijen (eds.), *Phonetics in Europe: Perception and Production* (pp. 281–302). Frankfurt am Main: Peter Lang.

Toassi, P. F. P., & de Albuquerque Pereira, S. H. (2019). Understanding cognate words in a first contact with English. *Caderno de Letras*, (35), 27-44.

Van Bezooijen, R., & Gooskens, C. (2005). Intertalig tekstbegrip. De begrijpelijkheid van Friese en Afrikaanse teksten voor Nederlandse lezers. Ms.

Vanhove, J., & Berthele, R. (2015). Item-related determinants of cognate guessing in multilinguals. In G. De Angelis et al. (eds.), *Crosslinguistic influence and crosslinguistic interaction in multilingual language learning* (pp. 95–118). London: Bloomsbury.

Appendix