

Lexical inferencing and the mutual intelligibility of Estonian and Finnish

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Several factors affect the comprehension of a text written in a language related to the reader's first language (L1): (i) orthographic similarity with the reader's L1, (ii) contextual clues, (iii) semantic relationships between components of phraseological units, and (iv) L1 reading comprehension strategies. This article compares the results of a cloze test (CT), in which a group of Finns read a text in their L1 (Finnish) and filled the gaps, and a translation test (TT), in which another group of Finns translated the Estonian version of the same text into Finnish. This text included five pairs of primes and targets, parts of the same phraseological unit, representing different semantic relations; in the CT the target was replaced by a gap and in the TT the respondents had to translate the target. The results indicated that the respondents used similar inferencing strategies in both tests, and thus provide evidence for the assumption that orthographic similarity is not the sole factor contributing to understanding a foreign text, but that L1 reading comprehension strategies are also employed.

Keywords: Estonian, Finnish, phraseological unit, receptive multilingualism, semantic priming

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1. INTRODUCTION

This article examines the mutual intelligibility of Estonian and Finnish, and is rooted within the respective multilingualism (RM) framework (see e.g. ten Thije & Zeevaert 2007): it approaches the mutual intelligibility of related languages by studying how individuals who have not learned the related language before understand it on the basis of their native language. Recent research in closely related languages has emphasised the effects of phonetic proximity and the similarity of vocabulary on intelligibility (see e.g. Gooskens 2006, 2007). However, similarity is not the only factor contributing to intelligibility, but various first-language (L1) skills, such as lexical inferencing, also promote comprehension. The ability of Finns to understand an Estonian text on the basis of their mother tongue is in this article approached from a cognitive perspective focusing on lexical inferencing. LEXICAL INFERENCING can be defined as using a variety of linguistic and non-linguistic clues to fill the gaps in understanding when encountering unfamiliar words in a text (Oxford 1990:47). A

reader of a text in a related language can try to infer the meaning of a word for which they find no resemblance with their mother tongue, based on general knowledge of the topic and other either factual or linguistic clues found in the text or in the word. The activation of this kind of background knowledge helps readers not only to make hypotheses about the meaning of an unknown word but also to confirm them (Vaurio 1998:60).

The material was obtained by using a Finnish-language cloze test (CT), which sheds light on the L1-based inferencing strategies, and a translation test (TT) from Estonian to Finnish. The text was first designed in Estonian for the TT, and for the CT it was translated into Finnish. The aim was to determine whether the construction of meaning is in both tests influenced by previous knowledge of e.g. the theme of the text, schemas, word combinations and collocations. By comparing the two sets of test results it was hoped to demonstrate that linguistic and discursive competences developed in the mother tongue create a precondition for a capacity for lexical inferencing.

Within RM, the article presents a new approach to reading comprehension by using the notion of SEMANTIC PRIMING, referring to the effect according to which the meaning of a word (a target) is recognised better or faster if it is preceded by another, semantically related word (a prime). The prime activates related words (words belonging to the same semantic field, synonyms, antonyms, hypernyms, hyponyms, etc.) in the reader's mind and thus facilitates recognition of the target. (For lexical priming, see e.g. Hoey 2005, 2007; Lutjeharms 2007:272–273.) The tests were designed to reveal whether certain semantic relations between concepts offer one possibility for Finnish speakers to understand a simple Estonian text.

The theoretical background of the study is discussed in Section 2. In Section 3, the aims of the study, the tests and the two separate groups of participants are described. Section 4 presents the results of the CT and TT. Both test groups were asked to validate their choices in replacing the missing words or translating an Estonian word into Finnish; these justifications are introduced in Section 5. Finally, in Section 6, the results of the study are discussed, and the possibilities of using lexical inferencing in RM situations, or in formal instruction of Estonian or Finnish as a second language, are considered.

2. CENTRAL CONCEPTS

2.1 *Crosslinguistic similarity*

Relatedness of languages makes it easy to notice similarities between words of the two languages, thus facilitating comprehension (for transparency of the lexical relatedness see van Beezoijen & Gooskens 2007:256). Of importance is the distinction

between actual, perceived and assumed similarity, suggested by Ringbom (2007:5–8). ACTUAL (objective) SIMILARITY can at least theoretically be defined by comparing the linguistic systems of related languages. PERCEIVED SIMILARITY refers to language learning, where learners become aware of second-language (L2) features that bear resemblance to their L1; the learners perceive something to be similar between L1 and L2. ASSUMED SIMILARITY, in turn, rests upon perceived similarity: because there are actual and perceived similarities between the languages, learners produce L2 by relying on the similarities they assume to exist. In the case of cognate languages, such as Estonian and Finnish, assumed similarity has a predominantly positive effect on learning (see e.g. Odlin 1989:27; Ringbom 2007:26; Kaivapalu & Muikku-Werner 2010:72; Jarvis 2011:2). However, when assumed similarity does not coincide with actual similarity, this leads to learner's errors (Ringbom 2007:7, 24; Kaivapalu 2009:388–389; Kaivapalu & Muikku-Werner 2010:74–75).

In the context of the present article, there are several reasons to pay attention to the similarity between Estonian and Finnish. Firstly, in the TT, actual similarity probably assists comprehension of a written text as a whole; several studies (Kaivapalu 2005; Kaivapalu & Muikku-Werner 2010; Muikku-Werner 2013) have shown that participants of an Estonian–Finnish TT can understand written Estonian on the basis of Finnish. Secondly, the TT design rests on the expectation that the respondents recognise the prime, which is a cognate word, and based on this they are able to infer the meaning of the non-cognate target (for the terms PRIME and TARGET see Section 2.2.3 below). Thirdly, on the basis of previous research (e.g. Kaivapalu & Muikku-Werner 2010; Paajanen & Muikku-Werner 2012) it is predicted that the participants of the TT assume some similarities between Finnish and Estonian that do not exist in reality, resulting in incorrect translations.

2.2 Lexical inferencing in reading comprehension

'Reading between the lines' is a strategy called LEXICAL INFERENCING. The term STRATEGY refers to a conscious procedure for solving a problem; the strategy of lexical inferencing involves a deeper processing of information given in the text, and it is considered to improve the comprehension of texts as a whole (see e.g. O'Malley & Chamot 1990; Bernhardt 1991; Vaurio 1998:41–44). In addition, all meaning in a text is to some extent social, because it is partly dependent on a certain situation and on the aims of the writer. As for the reader and the situation, they are both a part of a larger social community, the conventions, values and attitudes of which influence the emergence of meaning (Pitkänen-Huhta 1999:279; Holopainen 2003:21). Thus, successful reading in a foreign language is not directly or merely dependent on language skills, but also relies on the reader's background knowledge and processing strategies (see e.g. Coady 1979; Pitkänen-Huhta 1999:269).

Two different views to the comprehension process are utilised in the present article. The INTERACTIVE READING MODEL consists of two processes. In the bottom-up process, the reader constructs the meaning on the basis of the linguistic form of the text, whereas in the top-down process, the interpretation is directed by the experiences and background knowledge of the reader. (For a more detailed view of these processes see e.g. Rumelhart 1985; Underwood & Batt 1996; Pitkänen-Huhta 1999:263–266.) The second view, which is connected with the cognitive approach, is the SCHEMA THEORY (see e.g. Carrell & Eisterhold 1983; Lutjeharms 2007:277), which has been important in second language reading research, especially in the 1980s and 1990s (Koda 1994:16).

SCHEMA refers to unconscious mental structures representing generic knowledge about the world (see e.g. Rumelhart 1980:34). The features and content of an unfamiliar text are compared with items of information in the reader's long-term memory. All previous knowledge helps to deal with new information, and existing knowledge is used as a foundation of assumptions and conclusions. With the help of this knowledge, we can generate new knowledge and learn new things (Holopainen 2003:23–24). This view does not regard either memory or the mental lexicon as a mere storage of knowledge; remembering things and accessing words are seen as more dynamic and context-dependent phenomena (Dufva 1999:26–27). The schema theory has been criticised for failing to directly explain how a foreign language is understood (for details, see Forrester 1996), but some of its ideas, e.g. the importance of activating prior lexical and semantic knowledge, as well as the importance of coherence, are useful in describing the text comprehension processes.

When talking about a logical text, the term COHERENCE is relevant: coherence presents itself as the thematic unity of a text (van Dijk 1977:50–53). Trusting the text to be coherent also promotes reading comprehension. In a well-written text, the strong linkage of lexical elements can exceed the boundaries between sentences. From the text linguistic viewpoint, it is essential that certain items, sentences and words in a text are organised in a certain order, which is often based on the semantic relationships between concepts (see e.g. Enkvist 1975:32–37, 42–45; Halliday & Hasan 1976:4–10, 332).

Texts do not consist only of separated words, but the concepts in texts are connected through phraseological units which are linked with each other non-arbitrarily. The occurrence of one word can invite the co-occurrence of a second word; two items alongside each other (like the English words *strong* and *tea*) can have strong preferences for co-occurrence. (Sinclair 1991:110; Jantunen 2009:356–358) This kind of noticeable arrangement of linguistic elements is called COLLOCATION. Hoey (1991:6) defined collocation as 'the relationship a lexical item has with items that appear with greater than random probability in its (textual) context'. Collocation can be considered to follow a psychological, subconscious process, and most formulaic utterances are a part of first-language skills (Pace-Sigge 2013b:13–14): a reader

assumes that the information in the next sequence is relevant in a particular context. The coherence of a text, in particular when collocational items or other lexical combinations are situated in different clauses, is partly created by the associative relationship of lexemes (Halliday & Hasan 1976:284–286).

2.3 Semantic priming

In order to understand the mechanisms of meaningful connections between lexical items, the concept of SEMANTIC PRIMING is useful. Priming refers to the effect caused by the repeated experience of a stimulus. Priming may occur at several levels of linguistic structure, notably the lexical and the syntactic levels (Hoey 2007:8). Each time a combination of words is encountered, ‘we subconsciously keep a record of the context and co-text of the word’ (Hoey *ibid.*). Thus, when re-encountering the word, a record of its collocations is built up cumulatively. We are primed to recognise and replicate the meanings with which the word is associated. The previous context directs the reuse of the word (Hoey 2007:7–8). One of Hoey’s priming hypotheses states that every word is primed to occur with particular semantic sets which are its semantic associations (Hoey 2007:13).

In semantic priming, a particular word, a PRIME, provides the semantic context to another word, the subsequent TARGET, thus activating other words in the same semantic field (McNamara 2005:3–4, 11, 18). This activation is a form of retrieval from the semantic memory: words that go together make association possible (see Pace-Sigge with references 2013a:157–160, 162). Semantic priming can be used in many cognitive tasks, such as naming and semantic categorisation; it is a tool for researching word recognition, sentence and discourse comprehension and knowledge representation. Finding out how the regularities of associations can be explained is useful from the viewpoint of second-language learning and receptive multilingualism.

3. AIMS AND METHODS

The aims of the present article were based on previous research on reading comprehension (see Section 2.2 above) and earlier findings of RM between Estonian and Finnish (Muikku-Werner 2013, 2014, 2015, 2016). Three hypotheses can be presented as a background for research questions. Firstly, the semantic relationships between the components of phraseological units improve mutual intelligibility if one of the words is familiar on the basis of L1. Secondly, these relations represent a sort of ‘universal’ similarity with respect to content, thus differing from the orthographic similarity of cognates. Thirdly, other contextual cues, including knowledge of the world and of the theme, and coherence of the text, promote deciphering the meaning of an unknown word.

The overall aim of this work was to test whether the reading comprehension strategies of L1 are used when trying to understand a related language. The specific research questions were the following:

- What kind of strategies do the respondents use when trying to infer the meaning of either a removed word (CT) or an unknown Estonian word (TT)?
- Do the respondents have some common ways to fill the gaps in the CT when the missing word is an essential part of a phraseological unit or a collocational string?
- Do the respondents have some common ways to translate an unknown Estonian word that is an essential part of a phraseological unit or a collocational string?
- Do the respondents of the CT and TT reason about their decisions in the same way?

In order to test the hypotheses and answer the research questions, two different tests were planned. The first was a CT with a Finnish text: the participants were asked to suggest suitable replacements for removed words, in order to complete the gap. The second test was a TT, in which the participants were asked to translate a short text from Estonian into Finnish. The text was created in Estonian following the principles of the semantic priming theory so that the selected target words were primed by another word having a specific semantic relation with the target. The aim was to determine whether combinations of words based on specific schematic knowledge or semantic relations help to find the correct translation for the target. For the CT, the Estonian text was translated into Finnish and it contained the same priming relations (in this case, the target words were removed from the text). In addition, both groups of participants were asked briefly to describe or justify the clues that had led them to choose the replacement or the translation equivalent.

The CT was completed by 32 native Finnish speakers studying Finnish linguistics at university level (median age 24 years; 25 women, six men, one non-gendered). The Estonian–Finnish TT was performed by 25 participants with no proficiency in Estonian; this was a heterogeneous group consisting of people of different ages (median age 57 years; 17 women, eight men). All of them had either a high school education or a college degree. The number of participants was rather small, but was sufficient to test the applicability of this combination of CT and translation; one of the aims of this work was to determine whether these tests are able to show unanimity in deciphering meanings of missing Finnish or unknown Estonian words. If so, the awareness of inferencing techniques and semantic priming could contribute in the context of receptive multilingualism and when learning non-related languages.

The theme of the test text concerns Christmas. In order to make translating easier, the text was mainly constructed using simple main clauses, which might in some places have diminished the coherence of the text as a whole. However, the

focus in this research was in the relations between the prime–target pairs and the phraseological units. The text is presented below first in Finnish, then in Estonian and finally as an English translation of the Estonian text. Here and throughout the paper, the prime is presented in bold and italics, and the target in italics.

JOULU ON OVELLA

Kohta on joulu! Ennen **joulua** ostamme 1 Koristamme kuusen ja leikimme sen ympärillä. Tänä vuonna ostan sukulaisille kirjoja. Toinen kirja voi olla **kallis**, toinen 2 Katamme pöydän runsaasti: sen päällä on pähkinöitä ja olkisia tähtiä. Maljakossa on yksi **hyasintti**. Se on kaunis 3 Paitsi siitä pidän myös ruusuista ja tulppaneista. Viime jouluna otimme paljon kuvia. Tässä kuvassa on minun **isä** ja 4 Tässä kuvassa puolestaan on minun vaimo. Hän on 5 **Lapsi syntyi** heinäkuussa. Joulupyhinä ihmisillä on aikaa olla perheen kanssa.

JÕULUD ON UKSE EES

Kohe on jõulud käes! **Jõulu** eel ostame *kingitusi*. Kaunistame kuuse ja mängime selle ümber. Käesoleval aastal ostan sugulastele raamatuid. Üks raamat võib olla **kallis**, teine *odav*.

Katame laua rikkalikult. Sellel on pähkleid ning õlgedest tähed. Potis on üks **hüatsint**. See on ilus *lill*. Peale selle armastan ka roose ja tulpe.

Möödunud jõulu ajal tegime palju pilte. Sellel pildil on minu **ema** ja *õde*. Sellel pildil omakorda on minu naine. Ta on *rase*. **Laps sündis** juulis. Jõulupühadel on inimestel aega olla perekonnaga.

CHRISTMAS IS COMING

Christmas is coming! Before **Christmas** we'll buy *presents*. We'll decorate the Christmas tree and play around it. This Christmas I'll buy books for my relatives. One book may be **expensive**, the other *cheap*.

We'll set the table abundantly. On it there will be nuts and straw stars. In the pot is a **hyacinth**. It is a beautiful *flower*. In addition, I also like roses and tulips.

Last Christmas we took a lot of photos. This is a photo of my **mother** and *sister*. As for this photo, it is of my wife. She is *pregnant*. The **child was born** in July. At Christmas time, people have the time to be with their family.

In the CT, the participants were requested to skim the Finnish text, and in the TT, the participants translated the whole text. The CT is based on the notion of default value (see e.g. Brown & Yule 1983:223–224): if there is nothing in the text to provide a specific value for a particular slot, the slot will be filled by a default value, i.e. a stereotypical expression derived from the context. Christmas was considered to be a

schema familiar to the participants, and it was assumed easily to evoke default values connected with Finnish Christmas, e.g. presents, Christmas tree, Father Christmas and ham.

In the test texts, five phraseological units (prime and target pairs) were combined in five different ways. It is assumed that the semantic relations activated by the prime foster comprehension of the target. The semantic relations are here presented with the TT examples, but the same relations are also valid in the CT. In each case, the prime is a cognate word common to both Estonian and Finnish, whereas the target is non-cognate or phonologically considerably different from the Finnish equivalent. However, some of the targets were ‘false friends’ (for this term, see e.g. Ringbom 1987:124–125), i.e. words that orthographically resemble a Finnish word but which have a different meaning. The aim was to investigate whether the participants would base their answers on lexical (semantic) inferencing or on orthographic similarity.

The first relation is SCHEMATIC IMPLICATION, as in (1).

- (1) *Jõulu* eel ostame *kingitusi*. (TT; Est.)
 ‘Before *Christmas* we’ll buy *presents*.’
 (cf. Est. *jõulu* and Fin. *joulun* ‘christmas.GEN’; Est. *kingitusi* and Fin. *lahjoja* ‘presents.PAR’)

Inferencing the meaning of the non-cognate word *kingitusi* ‘presents’ (cf. Fin. *lahja* ‘present’) may be based on the schematic implication of the prime *jõulu* ‘Christmas’ and the verb *ostame* ‘we buy’. The first text paragraph ends with one optional present, a book, from which the reader possibly obtains support for this translation.

The second relation is based on ANTITHESIS; in (2) the components of the phraseological unit are connected on the basis of contrast.

- (2) Üks raamat võib olla *kallis*, teine *odav*. (TT; Est.)
 ‘One book may be *expensive*, the other *cheap*.’
 (cf. Est. *kallis* and Fin. *kallis* ‘expensive’; Est. *odav* and Fin. *halpa* ‘cheap’)

Presumably, the physical closeness of the words *kallis* ‘expensive’ and *odav* ‘cheap’ in the sentence facilitates the conceptualisation of price options.

The third and fourth relation are connected to the semantic fields, which enable diverse togetherness (see e.g. Larjavaara 2007:143–152). Example (3) illustrates the case of INCLUSION, in which the hyponym (*hüatsint* ‘hyacinth’) precedes the hypernym (*lill* ‘flower’), i.e. the semantic field of the prime is included within that of the target.

- (3) Potis on üks *hüatsint*. See on ilus *lill*. (TT; Est.)
 ‘One *hyacinth* is in the pot. It’s a beautiful *flower*.’
 (cf. Est. *hüatsint* and Fin. *hyasintti* ‘hyacinth’; Est. *lill* and Fin. *kukka* ‘flower’)

In (4a), in turn, the prime and the target (*ema* ‘mother’ and *õde* ‘sister’) are co-hyponyms and belong to the SAME SEMANTIC FIELD, kinship terms. A common semantic field creates preconditions for the co-occurrence of co-hyponyms. In the nuclear family schema, the tightest relation is between the parents or siblings. In order to test how strong the parenthood connection is, the primes in the CT and TT differed. In TT the prime is *ema* ‘mother’ (see example (4a)), but in the CT it is *isä* ‘father’ (see 4b).

- (4) a. Sellel pildil on minu *ema* ja *õde*. (TT; Est.)
 ‘In this photo are my *mother* and *sister*.’
 (cf. Est. *ema* ‘mother’ and Fin. *emä* ‘(animal) mother’; Est. *õde* and Fin. *sisar* ‘sister’)
- b. Tässä kuvassa on minun *isä* ja ... (CT; Fin.)
 ‘In this photo are my father and ...’

The aim was to determine whether the participants were prone to prefer filling the empty slot or replacing the missing word with the other parent, be it ‘father’ or ‘mother’.

Finally, the fifth semantic relation incorporated in the test is CAUSE–CONSEQUENCE, in which a relation is founded on knowledge of the world (see e.g. Enkvist 1975:42–45) and is consequently less dependent on mere semantic bonds. In example (5) below, causality is reduced to a relation of one condition being necessary for another to occur (pregnancy and the birth of the baby).

- (5) Ta on *rase*. *Laps sündis* juulis. (TT; Est.)
 ‘She is *pregnant*. The *child was born* in July.’
 (cf. Est. *rase* and Fin. *raskaana* ‘pregnant’; Est. *laps sündis* and Fin. *lapsi syntyi* ‘baby was born’)

It should be easy to infer that if the child was born in July, the wife mentioned in the text was pregnant during the preceding Christmas. This example differs from the others because the prime (the cognate subject and verb combination *laps sündis* ‘the baby was born’) follows, not precedes, the target. The aim was to test whether the word order influences recognition of the target.

4. TEST RESULTS

In this section, the results of the CT and the TT with respect to the five prime and target pairs from the previous section are described and compared. The tables present the expected replacement and other replacements chosen in the CT, and the correct translation and other translations offered in the TT. The numbers show both the absolute frequencies and the percentages (e.g. 11/34%). The answers, which were

	EXPECTED/ CORRECT ANSWERS	OTHER ANSWERS		
CT (N = 32)	<i>(joulu)lahja</i> '(Christmas) present' 11/34%	<i>(joulu)kuusi</i> '(Christmas) tree' 16/50%	<i>(joulu)kinkku</i> '(Christmas) ham' 4/12%	<i>suklaa</i> 'chocolate' 1/3%
TT (N = 25) Est. <i>kingitus</i> 'present'	<i>lahja</i> 'present' 16/64%	<i>(joulu)kinkku</i> '(Christmas) ham' 8/32%	<i>kynttilä</i> 'candle' 1/4%	

Table 1. Replacements and translations connected with the prime Fin. *joulun* or Est. *jõulu* 'Christmas'

given in Finnish, are supplemented with English translations. For the TT the Estonian target is presented, with an English translation.

Within the Christmas schema, there was a slight dispersion in answers (see Table 1). In the CT, the most favoured replacement (50%) was Fin. *(joulu)kuusi* 'Christmas tree' (lit.: 'Christmas spruce'). This choice is logical, because the text continues with the decoration of the tree. However, it causes repetition in the text and even though repetition guarantees thematic continuity, it is not a feature of well written text; a better structured option would have been to substitute the second occurrence with a pronoun. The other answers offered ('ham' and 'chocolate') are also words connected to the Christmas theme and thus the schematic implication appears to guide the participants very strongly in their choices.

In TT, however, the most common translation (64%) was the correct one (Fin. *lahja* 'present'), and thus the familiarity of the Christmas theme clearly diminished the number of incorrect proposals (see Table 1). In this test, translating Est. *kingitus* 'present' to Fin. *kuusi* 'spruce' was not an option because Est. *kuuse* (genitive form of 'Christmas tree') in the next sentence is a cognate word. The participants could easily recognise the cognate and thus had to seek for other translations for Est. *kingitus*. The incorrect translation Fin. *kinkku* 'ham' (and possibly Fin. *kynttilä* 'candle') probably resulted from the similarity of the Finnish and Estonian words. It is well known that speakers of Finnish and Estonian rely on words which resemble those in L1, and in this case, assumed similarity led to an incorrect translation (e.g. Ringbom 2007:9, 70). All in all, familiarity of the Christmas theme clearly diminished the number of incorrect proposals. The results are in line with Pitkänen-Huhta's (1999:267) observation that if the text subject is unknown to readers, they concentrate more on the linguistic form of the text, whereas with a known theme it is possible to make

	EXPECTED/ CORRECT ANSWERS		OTHER ANSWERS
CT (N = 32)	<i>halpa</i> 'cheap' 30/94%	<i>edullinen</i> 'low-priced' 2/6%	
TT (N = 25)	<i>halpa</i> 'cheap' 21/84%	<i>odottaa</i> 'to wait' 1/4%	— 3/12%
Est. <i>odav</i> 'cheap'			

Table 2. Replacements and translations connected with the primeFin./Est. *kallis* 'expensive'.

use of previously acquired conceptual knowledge (the top-down process of reading comprehension, see Section 2.2 above).

In the case of antitheses with Fin./Est. *kallis* 'expensive' as the prime (see Table 2), there were only two options offered in the CT: Fin. *halpa* 'cheap' (94%) and Fin. *edullinen* 'low-priced' (6%). These may be considered as close synonyms, and thus this contrasting relation appears to guide the participants' choices very strongly. Furthermore, the expected choices were probably promoted by physical closeness of the prime and the target in the text. In the TT, Fin. *halpa* 'cheap' was the most common alternative, too, but its share was slightly smaller (84%). However, there were three respondents (12%) who did not translate the word at all, and one respondent (4%) chose the Finnish verb *odottaa* 'to wait', probably because of the similarity of the first letters of the words.

The hyponym-hypernym relation guided the participants strongly in the CT so that the majority (91%) offered the hypernym Fin. *kukka* 'flower' (see Table 3) when the prime in the previous sentence was the hyponym Fin. *hyasintti* 'hyacinth'. The other answers are also logical in the sentence context. The TT provided a greater variety of translations for the unfamiliar Estonian target *lill* 'flower', and the share of the correct translation was only 40%. The translations Fin. *lila* 'lilac' and Fin. *lilja* 'lily' were probably chosen on the basis of similarity of the Estonian and Finnish words, which represent the phenomenon of 'false friends' between Estonian and Finnish. Fin. *violetti* 'purple' was probably offered as a synonym for Fin. *lila* 'lilac'. The translation Fin. *pieni* 'small' was most probably influenced by the resemblance between the Estonian *lill* and the Swedish *lilla* 'small'; Swedish was available for the participants because as the second national language of Finland, it is studied obligatorily at school. This time, however, the clue was misleading (for similar results, see Muikku-Werner & Heinonen 2012:179; Paajanen & Muikku-Werner 2012:238).

	EXPECTED/ CORRECT ANSWERS	OTHER ANSWERS					
CT (N = 32)	<i>kukka</i> 'flower' 29/91%	<i>kukassa</i> 'in bloom' 1/3%	<i>koriste</i> 'decoration' 1/3%	<i>katsella</i> 'to look' 1/3%			
TT (N = 25)	<i>kukka</i> 'flower' Est. <i>lill</i> 'flower' 10/40%	<i>lila, violetti</i> 'lilac' 5/20%	<i>pieni</i> 'small' 5/20%	<i>lilja</i> 'lily' 2/8%	<i>kaunis</i> 'beautiful' 1/4%	<i>ilo</i> 'joy' 1/4%	<i>tuoksua</i> 'to smell' 1/4%

Table 3. Replacements and translations connected with the prime Fin. *hyasintti* or Est. *hüatsint* 'hyacinth'.

	EXPECTED/ CORRECT ANSWERS	OTHER ANSWERS					
CT (N = 32)	<i>äiti</i> 'mother' (prime <i>father</i>) 28/88%	<i>minä</i> 'I' 1/3%	<i>veli</i> 'brother' 1/3%	<i>mummo</i> 'granny' 1/3%	<i>kissa</i> 'cat' 1/3%		
TT (N = 25)	<i>sisar</i> 'sister' Est. <i>öde</i> 'sister' 1/4%	<i>isä</i> 'father' (prime <i>mother</i>) 11/44%	<i>täti</i> 'aunt' 3/12%	<i>setä</i> 'uncle' 1/4%	<i>sukulaiset</i> 'relatives' 1/4%	<i>kohtalo</i> 'fate' 1/4%	— 6/24%

Table 4. Replacements and translations connected with the prime Fin. *isä* 'father' or Est. *ema* 'mother'.

The other alternatives (Fin. *kaunis* 'beautiful', *ilo* 'joy' and *tuoksua* 'to smell') are also reasonable in the context of hyacinths. On the whole, it can be concluded that in this case, the semantic relation of inclusion (hyponym–hypernym) had a weaker impact (40% of correct translations) on lexical inference than similarity (Fin. *lila*, *pieni* and *lilja* altogether 48%).

In the case of the same semantic field (kinship terms), where Fin. *isä* 'father' (CT) or Est. *ema* 'mother' (TT) was the prime, the participants of both tests (see Table 4) preferred the semantic category of parenthood, not family membership at a more general level. In the CT, Fin. *äiti* 'mother' was the most common answer (88%), and most of the other options also referred to family members. Fin. *kissa*

	EXPECTED/ CORRECT ANSWERS	OTHER ANSWERS						
CT (N = 32)	<i>raskaana</i> 'pregnant' 16/50%	<i>kaunis</i> 'beautiful' 8/25%	<i>ihana</i> 'lovely' 3/9%	<i>mukava</i> 'nice' 1/3%	<i>Helena</i> <i>Liisa</i> 1/3% 1/3%	<i>lääkäri</i> 'doctor' 1/3%	<i>synnyttänyt</i> 'given birth' 1/3%	
TT (N = 25)	<i>raskaana</i> 'pregnant' Est. <i>rase</i> 'pregnant' 8/32%	<i>kiire</i> 'hurry' 1/4%	<i>rikki</i> 'broken' 2/8%	<i>raskas</i> 'heavy' 1/4%	<i>rauhallinen ruusu</i> 'peaceful' 1/4%	<i>muisto</i> 'rose' 1/4%	<i>—</i> 'memory' 1/4%	9/36%
		<i>kiireinen</i> 'busy' 1/4%						

Table 5. Replacements and translations connected with the prime Fin. *lapsi syntyi* or Est. *laps sündis* ‘the baby was born’.

‘cat’ was the only non-human alternative, but still a possible creature to be featured in a photo. In the TT, the share of the other parent (in this case Fin. *isä* ‘father’) was considerably lower, 44%. This might be explained by the fact that the prime Est. *ema* ‘mother’ has in Finnish a cognate whose meaning is partly differentiated: Fin. *emä* refers to the female parent of an animal and the connection is thus confounding. The correct translation of Est. *õde* ‘sister’ was offered by one respondent only (4%). Some more remote relatives were also suggested, and six respondents (24%) left the word untranslated. The translation Fin. *kohtalo* ‘fate’ is probably based on another false friend between Swedish and Estonian (cf. Swedish *öde* ‘fate’). All in all, this part of the test still shows that answers are influenced by ‘mother’ and ‘father’ as frequent collocations of each other in language use (on the relation of priming and collocation, see Pace-Sigge 2013b:31). Furthermore, 72% of the options offered in the TT referred to family relationships, which confirms the effect of the same semantic field.

The final semantic relation was that between a cause and its consequence, with the birth of a child as a prime and the word Fin. *raskaana* or Est. *rase* ‘pregnant’ as the target. Even though this relation is very natural, the number of different replacements in the CT (eight options) and translations in the TT (eight options) is notably greater than in the previous examples (see Table 5). The share of expected replacements was 50% in the CT and that of the correct translations in TT only 32%. One explanation may lie in preceding, unsuccessful comprehension. If the idea of photos with family members was partly or totally lost by the participants in the TT, it was very difficult to end up with the pregnant wife theme. This may explain why nine participants (36%) did not give any translation for Est. *rase* ‘pregnant’. In the CT, however, the

participants should not have had comprehension difficulties, and thus there must be other explanations. Possibly the reverse order of the prime and target (the target preceding the prime) made it difficult to see the logical connection. Furthermore, the change from the present tense to the simple past in this part of the text may have caused some confusion (see the test texts in [Section 3](#) above). Apparently, estimating the time of taking the photo, being pregnant and giving birth was not as effortless as assumed.

In the CT, the participants suggested some qualities of the wife (Fin. *kaunis* ‘beautiful’), a name (Fin. *Liisa* or *Helena*), or her occupation (Fin. *lääkäri* ‘doctor’). In the TT, the equivalents Fin. *rikki* ‘broken’, *raskas* ‘heavy’, *rauhallinen* ‘peaceful, calm’ and *ruusu* ‘rose’ share a few letters with Est. *rase*, suggesting the influence of assumed similarity. If the pronoun Est. *ta* ‘she’ in the beginning of the sentence (Est. *Ta on rase* ‘She is pregnant’) was correctly translated to Fin. *hän* ‘she’, one could have easily thought that she might be busy (Fin. *kiireinen* ‘busy’) during Christmastime. If the pronoun is translated with the pronouns Fin. *se* ‘it’ or *tämä* ‘this’, the referent in the previous sentence may have been the photo or the frame, which can be broken (Fin. *rikki* ‘broken’) or which can memorialise the wife (Fin. *muisto* ‘memory’).

All in all, most participants in the CT succeeded in creating a logical text. It has been discovered that reading strategies used in L1 transfer to L2 reading, but some proficiency in L2 is required (Alderson 1984:20–21). In the case of Estonian and Finnish, however, close relatedness creates the prerequisites for some comprehension of the Estonian text, making it possible to make use of L1 reading strategies. The results of the TT show that even though the respondents did not always find the correct translations, they were still able to construct reasonable connections and recognise the phraseological units as elements of a coherent text.

Context in the widest sense of the word seemingly played a key role in finding a suitable translation for the five words selected for closer observation in TT. On the one hand, if the assumed meaning did not fit the context, the participants attempted to continue the deciphering process. On the other hand, they could proceed by relying on the incorrect meaning of a word which they inferred on the basis of similarity of the Estonian and Finnish words. The interpretations of separate words were then erroneously fitted into an incorrectly activated schema (see Vaurio 1998:80; Paajanen & Muikku-Werner 2012:229–230). For example, the false friend translation *rikki* ‘broken’ of the Estonian *rase* ‘pregnant’ cuts the connection between the pregnant wife in the photo and the birth of the baby in July. However, the respondent seems to have built a new connection based on the photo and the broken glass of the frame. The findings are thus in accordance with the hypotheses stated in the beginning of [Section 3](#): the participants mostly aim at constructing a (relatively) coherent and reasonable text with the help of the clues offered by the schematic whole and different semantic relations.

5. JUSTIFYING THE REPLACEMENTS AND TRANSLATIONS

In the above, replacements and translations activated by different primes were presented, and obviously choosing them was influenced by many factors. This section focuses on the reasons the respondents gave for their decisions in the two tests. In the CT, the respondents provided justifications for their choices, and in the TT they explained the reason for choosing a correct or incorrect translation (if a target was left untranslated, there were no justifications). The answers are organised according to the same semantic classification as that used in Section 4 and introduced in Section 3 above. The answers were originally written in Finnish, but here only the English translations are given. As shown in some answers, especially in the TT, the respondents debated a couple of alternatives or they based their translation on several simultaneous strategies.

First, within the schema of Christmas, the correct translation for Est. *kingitus* ‘present’, as in (6a) below, and in the CT some other choices such as ‘chocolate’ in (6b) or ‘Christmas tree’ in (6c) were justified by referring to their compatibility with the theme. In (6d), the respondent’s first association was Fin. *joulukinkku* ‘(Christmas) ham’, probably based on the Christmas theme and the orthographic similarity of Est. *kingitus* ‘present’ and Fin. *kinkku* ‘ham’.

- (6) a. Presents are bought before Christmas. (TT)
- b. In my mind, chocolate is strongly connected with Christmas (things are bought before Christmas). (CT)
- c. Christmas tree, because the following sentence deals with its decoration. (CT)
- d. *Kingitusi* – it could be ham [Fin. *joulukinkku*] . . . , but the text as such did not deal with food. (TT)

The second relation involved antonymy, and as stated in Larjavaara (2007:146), the polarisation of the world and contrasting things are essential for human beings. Opposition is a primal part of our conceptual system, and opposition was explicitly referred to both in the CT, exemplified in (7a) below, and the TT, as seen in (7b–c). In (7c), the respondent described choosing the antonym as a logical solution.

- (7) a. The opposite of expensive → cheap. (CT)
- b. Cheap (I thought it’s the opposite of expensive). (TT)
- c. Logical, contrary to expensive. (TT)

The idea of a hypernym consisting of hyponyms, the third relation in the test settings, also appeared to contribute to choosing a replacement in the CT, as seen (8a) below. In addition, (8b) shows that after the prime Est. *hüatsint* ‘hyacinth’ in the TT, lexical inferencing of the target Est. *lill* ‘flower’ is based on other flowers mentioned in close context in the test text (refer to the test text in Section 3). The statement in

(8c) explicates the misleading influence of a false friend (Est. *lill* ‘flower’, Fin. *lilja* ‘lily’); however, the respondent avoided the error in his final choice of Fin. *kukka* ‘flower’.

- (8) a. It [hyacinth] is a Christmassy flower, isn’t it? (CT)
 b. Flower – hyacinth, rose, tulip . . . all are flowers. (TT)
 c. I made a guess on the basis of the context. At first, I thought about a lily. (TT)

The fourth semantic relation in the tests concerns words belonging to the same semantic field, and this effect was also reflected in the answers: the frame of relatives helped to categorise concepts to the same semantic field. However, the prime ‘father’ or ‘mother’ appeared to activate the words in ‘opposition’, ‘mother’ and ‘father’, and the category of parents appeared to be a stronger principle creating associations than the more general co-hyponymy (family members), exemplified by (9a–b) below. Consequently, other family members were mentioned much less frequently, although some participants pondered the semantic field of relatives, as in (9c). Interestingly, in (9d) one respondent was convinced about ‘right’ answers but made decisions based on liking in the CT, and in (9e), the respondent described the discrepancy created by the logical semantic relation (‘mother’–‘father’) and the orthographic dissimilarity of the Estonian target (*õde*) and Finnish *isä* ‘father’.

- (9) a. Father and mother are associated, they form a unit, parents. (CT)
 b. Comparison of the word pair *äiti* [‘mother’] and *isä* [‘father’] when *ema* must be mother. (TT)
 c. It has to be some relative, probably an aunt. (TT)
 d. *Äiti* [‘mother’] would have been a more natural choice but grandma sounds nice! (CT)
 e. On the basis of the context I wanted to guess *isä* [‘father’] but the word did not look at all like it. (TT)

The final relation examined in the tests was that between the cause and its consequence, with the birth of a child as the prime. If the participants relied on the subsequent sentence in which the birth of the child is mentioned, the antecedent pregnancy could be deduced, as demonstrated in (10a–b).

- (10) a. Before a baby can be born, one has to be pregnant. (CT)
 b. The following sentence tells about the birth of the baby, so certainly pregnant. (TT)

In addition to the semantic relations, the justifications shed light on the way the false friends between Estonian and Finnish influence choosing a translation. As previous studies (Kaivapalu 2005:271; Kaivapalu & Muikku-Werner 2010:83) have

shown, Estonians and Finns trust in the similarity between the two cognate languages. The targets in the TT contain some false friends which were placed in the text on purpose to mislead the participants, and the results show that they indeed led to incorrect translations based on assumed similarity. In some cases, the similarity between Estonian and Finnish was the starting point of inference (11a–b) below, and interestingly, sometimes the participants found similarities between Estonian and Swedish (11c–d) and translated the meaning of the Swedish word into Finnish. However, because assumed similarity was stronger than actual similarity, adherence to the idea of resemblance led to incorrect translations (see also Ringbom 2007:7, 25–26). In (11e), the similarity between Estonian and Finnish words was further supported by the colour of the object.

- (11) a. *Lilja*, . . . the word externally resembles the word *lilja* ['lily']. (cf. Est. *lill* 'flower')
- b. Sounds like Finnish *rauhallinen* ['calm']. (cf. Est. *rase* 'pregnant')
- c. Similar to the Swedish word *lilla* ['small']. (cf. Est. *lill* 'flower')
- d. In Swedish, the word *öde* means 'destiny'. (cf. Est. *õde* 'sister')
- e. Generally, hyacinths are lilac. (cf. Est. *lill* 'flower')

In previous research, Bernardini (2001:258) listed strategies used for foreign language reading comprehension: Readers are looking for collocation, and they pay attention to context (for similar results, see Vaurio 1998:75–79). Of these strategies, the consideration of context and some semantic relations directing the connection of the prime and target were mentioned by the participants of the present study when they described their lexical inferring processes. Linking pregnancy and birth of the baby also utilises implicit knowledge of the world. Thus, the interpretations were directed by the experience of the relations between affairs and knowledge of the world, i.e. top–down processing was used. The results are for the most part also in agreement with previous studies on understanding Finnish or Estonian texts on the basis of L1. It has been shown that the Estonians and Finns base their choices of translation equivalents on a conception of coherent texts or on contextual suitability (Kaivapalu & Muikku-Werner 2010:83–84; Muikku-Werner 2015:205, 2016:332).

6. DISCUSSION

This article has presented a study which tested the comprehension of phraseological units on the basis of semantic relations. A group of Finnish participants was asked to complete a cloze test (in Finnish), and another group to translate a short Estonian text into Finnish. This combination of tests was chosen for comparing the L1 reading comprehension strategies with the translation strategies used when dealing with an

Estonian text. In the CT a Finnish version of the test text was used, and in the TT a similar text was presented in Estonian. The text was constructed around the Christmas theme, which was assumed to be very familiar to the participants and to allow the use of content and schema knowledge. The core of the analysis were five pairs of primes and targets, chosen to represent five different semantic relations; in the TT, the prime was a cognate word (supposedly easily recognisable for Finns) and the target a non-cognate word, impossible to understand on the basis of Finnish. The tests were separate from each other: the participants of the CT did not take part in the TT or vice versa.

The comprehension strategies in the CT and in the TT appeared to be similar, thus providing evidence for the hypothesis that readers rely on their L1 comprehension strategies when dealing with a text written in a foreign language. In the TT, the participants had less information than those performing the CT in their mother tongue, since they did not understand every word in the surrounding Estonian text. However, several prerequisites for increased intelligibility were created by choosing cognate words as primes, and by a familiar theme (schema) with its conventional elements. When trying to solve the problem with either a missing or an unknown word, both groups of participants relied on universal and encyclopaedic knowledge: metalinguistic knowledge of a coherent text and the structure of semantic fields. Most probably there were multiple factors, as discussed in Sections 4 and 5, that collaterally influenced successful lexical inferences.

Assumed semantic relations between the prime and target (based on L1) appeared to help to infer the meaning of the unfamiliar part of a phraseological unit. The qualities of these semantic relations did not depend on the similarity of Estonian and Finnish, but rather on more universal 'regularities'. However, the similarity of Estonian and Finnish was by no means an unimportant factor in the text comprehension process: an inferring process based on the semantic relations was possible only when the participants understood the prime. Understanding a cognate language is dependent on all linguistic knowledge, including among other things proficiency in other foreign languages (for similar results, see e.g. Hufeisen & Marx 2007:308; Singer 2007:343). Sometimes the similarity of the unknown Estonian target word and a Finnish – or Swedish – word appeared to have an influence on the translation process. For this reason, orthographic resemblance was a source of many incorrect translations in the TT: Estonian *lill* 'flower' was translated in Finnish with a rather similar word *lila* 'lilac', and *õde* 'sister' was associated with Swedish *öde* 'fate', and the Finnish word *kohtalo* 'fate' was chosen.

It is important to note that semantic priming can also lead to incorrect choices in the TT: The word *õde* 'sister', connected with *ema* 'mother', was incorrectly translated as *isä* 'father'. In order to find the meaning of *õde*, the participants used

reference to the narrow semantic category of parenthood, not to the more general level of family membership, as the starting point of their inference process. It appears that the collocational expectation of the combination of words 'mother' and 'father' is so strong that it was in this case fallacious.

The differences between the results of the CT and TT are not great: in most cases, the predictable replacement of the missing word and the correct translation of the target were the most frequent solutions. Some results of the TT, such as the significance of context for inferences, are in agreement with previous research of second-language reading comprehension (see e.g. Bernhardt 1991, Vaurio 1998). The reasoning of the respondents, demonstrated by the written comments justifying their linguistic choices, was also predominantly similar.

The results of this study are only suggestive, as the number of the participants was rather small and the topic of the text was restricted. These limitations prevent too daring conclusions, and the nature of the study is above all method-introducing. However, the results do show a certain degree of consistency. In future, it would be useful to construct a text with more instances for every inference strategy, in order to eliminate accidental effects. The order of the prime and target should also be considered, since the reverse order in the cause–consequence relation appeared to confuse some participants. Another thing to consider would be the background of the participants: in the CT, the participants were students of Finnish linguistics, who might have special sensitivity to language and textual features, which could have impacted the results.

Some questions remain open for further research. Does the distance – being in the same sentence or in a later one – between a prime and a target influence the meaning inference process? Does the number of primes (for example several co-hyponyms) in the close context improve the translation process? If the non-cognate target precedes the cognate prime, is it more difficult to infer the meaning of the unknown word? Do the choices have any resemblance to general collocational preferences (compared with large text corpora)?

In order to increase the intelligibility of a cognate language, the participants of interactional RM situations or language learners in the class context could be instructed to pay attention to semantic relations and the associations between words in close context, i.e. in phraseological units. The collocational constraints of the words in a foreign language are not necessarily easy to grasp (Gass & Selinker 1994), but teaching materials and teachers can provide essential shortcuts to priming (Hoey 2005). The semantic associations between words have already been utilised in L2 acquisition and teaching (see e.g. Bonk 2000 and Lewis 2000). Kristiansen (1998:25–31, 85–87, 203–205) emphasised the significance of semantic hierarchies in the interpretation of everyday contacts as an effective learning strategy. Instead of trusting orthographic or phonological similarity too eagerly, one could utilise the

wider context, familiar lexical elements as well as knowledge about the world more effectively. All universal, and thus predictable, linguistic knowledge can be a source of improved comprehension. The tests presented in this article demonstrate that besides the relatedness of Estonian and Finnish, the awareness of semantic priming, known on the basis of L1, can contribute to the comprehension of Estonian written text.

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