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Supervisor: Marianne Gullberg

The relative influence of English (L2) vs. Russian (L1) on the translation from Swedish (L3) into Russian depending on proficiency in L3

Nadezda Tkachenko

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Abstract

This study examined the relative influence of L1 and L2 on the translation from L3 to L1 depending on the proficiency level of participants in the L3. Native speakers of Russian, matched for proficiency in English (L2), translated words from Swedish (L3) into Russian (L1). The words were Russian-Swedish, English-Swedish, English-Russian-Swedish cognates, and noncognates. Three groups participated in the experiment: beginners in Swedish, intermediate learners of Swedish, and advanced Swedish speakers. The results show that the speed of translation depends on both word type and proficiency level. As expected, beginners responded more slowly than two other groups, but responses to English-Russian-Swedish cognates and English-Swedish cognates appeared to be faster than Russian-Swedish cognates and noncognates, showing that the influence of English is relatively stronger than the influence of Russian. Advanced speakers were faster than beginners, but were unexpectedly slower than intermediate learners and showed no influence of English, translating English-Swedish cognates and noncognates with almost similar speed. Moreover, they were slower than intermediate participants in translating even Russian-Swedish cognates. Intermediate learners were equally fast in translating English-Russian-Swedish cognates and Russian-Swedish cognates, and relatively fast in translating English-Swedish cognates. The findings are discussed in terms of usage and activation patterns of the three languages.

1. Introduction

In Sweden there are a lot of students from abroad who are native speakers of different languages and who use English as the language for studying and communicating. Thereby, they are at least bilingual. But studying in Sweden most of them also use Swedish for communication. This trilingual situation raises questions about the process of translation from the third language (L3) to the first language (L1) by unbalanced trilinguals. Based on the notion of crosslinguistic influence we can assume that not only Swedish (L3) and the L1 should affect on the translation, but also L2 English. Surprisingly, few studies have previously examined crosslinguistic influence in translation from a third language. This study examines translation from Swedish as the L3 into Russian as the L1. Swedish and Russian are very different languages with Swedish being closer to English. A reasonable assumption therefore is that translation from Swedish into Russian may be influenced by English. But on the other hand, Russian is a native language and the basic concepts were acquired in Russian such that its effect on the translation may be stronger. Thus, our main research question was: *What is the relative influence of English vs. Russian on the process of translation from Swedish into Russian?*

We assumed that this influence depends on proficiency levels in Swedish and English. Our second research question was therefore: *How does the influence of English and Russian differ, depending on the proficiency in Swedish?* To study these questions, we investigated participants are highly proficient in English, but with different levels of proficiency in Swedish. When we recruited our participants we did not mention English at all, since we knew that all of them passed an examination to determine their English competence (TOEFL or the Academic Version of IELTS) as an admission requirement, and their level allows them to study at the University. We only asked our participants whether they study or speak Swedish. Twenty six unbalanced trilinguals took part in the experiment and they were divided into three groups according to the information they provided in a language experience questionnaire: beginners in Swedish, intermediate learners of Swedish, and advanced speakers of Swedish.

The *purpose of this paper* then is to estimate the relative influence of L2 vs. L1 on the translation from L3 to L1 depending on the proficiency level of participants in L3. We predicted that response latencies would be shorter the higher the proficiency level of participants, and that the relative influence of English would be less strong the higher the proficiency level.

2. Background

Psycholinguistic studies of bilingual processing are preoccupied with how languages interact in the bilingual mind. Psycholinguists generally concentrate their attention on the structure of memory storage, activation and processing. They discuss how several languages are kept in the mind of a person and how (in what order) languages are activated in the bi-/multilingual mind. They offer and test different models of the mental lexicon and lexical access. Linguists consider these issues in terms of crosslinguistic influence. They focus on at what levels and how languages influence each other discussing these issues in terms of representations rather than of processing.

2.1. Crosslinguistic Influence in Linguistics

The linguistic approach assumes that when learners deal with several languages, there is crosslinguistic influence (CLI). CLI is an internal phenomenon which exists in the minds of individual language users. It arises from the interaction of languages stored and processed within the same mind. A detailed overview of studies concerning CLI is made by Jarvis & Pavlenko (2010). The languages interact on different levels of the memory system and the need to represent the relationship between them in the mind of a single bi- or multilingual requires careful differentiation between the semantic and conceptual levels of representation, as well as between implicit and explicit representations.

Conceptual representations or conceptual categories, in the opinion of Jarvis & Pavlenko (2010), involve mostly implicit knowledge about the properties and the scripts associated with a particular category, knowledge about category prototypes and peripheral members, as well as knowledge about internal structure of the category and its links to other categories. This knowledge includes (but is not limited to) visual (mental imagery), auditory (sound), perceptual (texture), and kinesthetic (sensory-motor) information. Semantic representations also involve the mostly implicit knowledge about the mapping between words and concepts (they determine how many concepts and which particular concepts are denoted by a particular word) and connections between words (involving the information about collocations, word associations, synonymy or antonymy) (Jarvis & Pavlenko, 2010: 118).

Implicit knowledge refers to the knowledge that individuals may not be aware of (but researchers may infer this knowledge from systematic verbal performance). Explicit knowledge involves knowledge such as word definitions and grammatical rules. Individuals are aware of this kind of knowledge, and capable of verbalizing it on demand. The extent of this metalinguistic knowledge in the L1 depends on the person's level of education. In the case when the L2 is learned in the classroom, the extent of this knowledge is much greater, and it may play a quite central role in L2 performance of beginning and intermediate students (Jarvis & Pavlenko, 2010 referring to Paradis, 1994, 2004).

Linguistic transfer in most cases arises from interlingual association formed between structures in two or more languages. This may happen as a result of language learning (as learning strategy), communication and socialization. Languages are different: they may differ in the structure of particular conceptual categories (conceptual representation), or in the links between these concepts and words, as well as between words and other words (semantic

representation). If more than two languages are involved, the situation becomes more complicated, studied in the relatively new field of third language acquisition (see e.g. in Cenoz, Hufeisen & Jessner, 2001). One of the important consequences of interlingual associations is that the use of structures in one language will most likely activate the corresponding structures in the other language. Mental lexical representations are linked across languages, and as Pavlenko and Jarvis (2010) mention, these mental links between languages may affect a person's ability to access words. The authors assume that knowledge of words in one language may impede the ability to access words in another language.

2.2 Psycholinguistic Approaches and Multilingual Lexicon Models

The lexicon is considered to contain all the information or pointers to the information that we know about a word. It is a compound net of interconnections which coordinates a huge amount of knowledge. The lexicon contains phonological, semantic, orthographic information about all the words, as well as the syntactic roles they can adopt. It seems quite difficult to say where in the lexicon the word meaning ends and the knowledge about the world starts. Every word has connections with a lot of other words and with the general information in the memory; all these mental interconnections form the scope of what we suppose to be the word knowledge.

Different theories about the structure of the mental lexicon have been proposed in last few decades in the fields of psycholinguistics, cognitive psychology, and language acquisition. On the bases of these theories, different models about word perception and word production have been suggested, largely based on studies with monolingual participants. Inasmuch as the purpose of our psycholinguistic research is to study the translation process from L3 to L1 by multilinguals, the bi- and multilingual mental lexicon models will be discussed in this section.

For bilingualism and second language research, a central issue is how the words we know in different languages are interconnected with each other. This mental interconnection can be both direct through interlingual "word↔word" associations, and indirect through links to extralinguistic representations. If the words we know in different languages are mentally interconnected, it means that our word knowledge in one language may affect the learning, processing and use of words in another language. Indeed, in the area of language

comprehension research there are two competing theories about how exactly cross-language interference effects relate to the way words from different languages are stored and processed.

With respect to lexical storage, scholars generally suggest the two following possibilities: either we have 1) separate lexicons, or 2) a common lexicon. The first hypothesis presupposes that there are several lexicons for each of the languages (separate-store models). The main idea of this hypothesis is that bilinguals form stronger associations among the words within each of their languages than between corresponding words across their languages, thus language separateness is secured. The following studies report evidence for separate storage between a bilingual's different language representations (Macnamara, 1967; Macnamara & Kushnir, 1971; Scarborough, Gerard, & Cortese, 1984; Kirsner, Smith, Lockhart, King, & Jain, 1984; Gerard & Scarborough, 1989). The second hypothesis presupposes the existence of an integrated lexicon for all the languages a person knows (common-store models). There is evidence for shared conceptual knowledge underlying a bilingual's languages (see Schwanenflugel & Rey, 1986, Paivio, Clark, & Lambert, 1988; Chen & Ng, 1989; Glanzer & Duarte, 1971; Altarriba & Mathis, 1997). These studies suggest that links between words in each language and concepts provide the basic form of interconnection. Most of the evidence now tends to favour the common-store hypothesis.

Attempts to combine these two hypotheses were made in (Potter, So, von Eckhardt, and Feldman, 1984; Grosjean & Soares, 1986; Taylor & Taylor, 1990). Grosjean and Soares (1986) argued that the lexicon in a bilingual is flexible and that its behavior depends on circumstances, namely task demands, experimental stimulus materials, relative language fluency and expectation, regarding which languages will be relevant for responding. Taylor and Taylor (1990) proposed that different kinds of words are stored differently: concrete words and cognates are stored in common, whereas abstract words are stored in separate stores. The

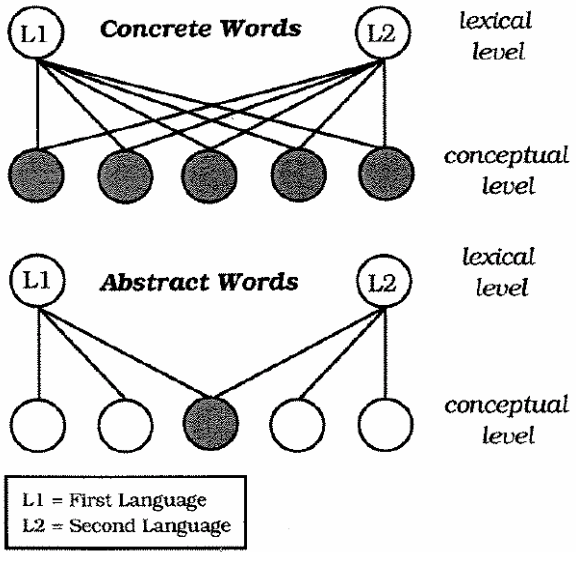


Fig.1 The Distributed Feature Model (adapted from De Groot, 1992)

findings that bilinguals translate concrete words and cognates faster than abstract words (De Groot, 1992, 1995; van Hell & De Groot, 1998) are used as evidence for The Distributed Feature Model (DFM) which was proposed in De Groot (1992). This model is characterized by attention to crosslinguistic differences (Fig.1). The DFM presupposes that the representations of concrete words and cognates are largely shared across languages. The representations of abstract words are considered to share fewer semantic features. It is worth mentioning that the DFM is criticized, since it lacks a developmental component, and it relies on a feature-based approach and does not account for prototype and context dependence effects (Pavlenko, 2009: 144-145).

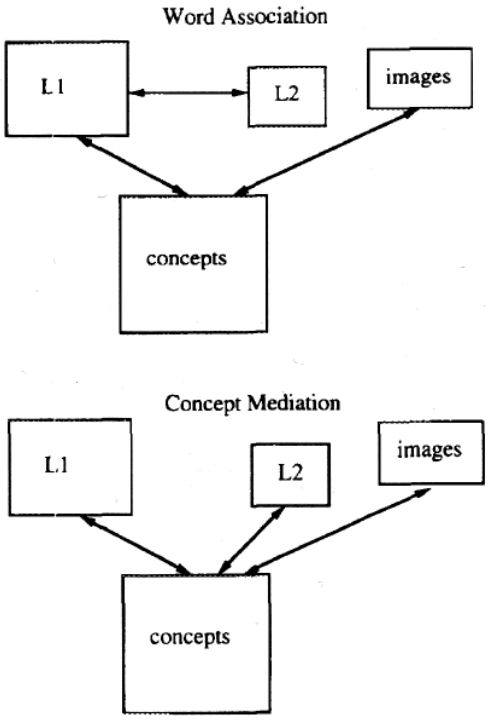


Fig.2 Two models of language interconnection (adapted from Potter et al., 1984)

Potter et al. (1984) came to the conclusion that both hypotheses are correct, but they described the structure of a multilingual's memory at two different levels of representation. They considered that words in each of a multilingual's languages are stored in separate lexical memory systems, whereas concepts are stored in a memory system common to all the languages a person knows. All these systems are hierarchically related. Potter et al. (1984) also discussed two models, which connect the languages and mediate the activity between them; they are word association and concept mediation (Fig.2). The word association and concept mediation model provide the processing of the words and lexical access. The word association model assumes that L2 forms are associated with L1 word, and only through L1 mediation can L2 words access the concepts. The concept mediation model assumes direct access of L2 words to the concepts.

Potter et al. (1984) tested these models with the help of bilingual translation performance and picture naming (in the L2). The word association model predicts that translation from L1 to L2 (on the basis of lexical links and without conceptual access) should be faster than picture naming which requires conceptual access (the path should be Image→Concept→L1→L2). The researchers compared data from highly fluent Chinese-

English bilinguals and less fluent English-French bilinguals. The results provided clear support for the concept mediation model: picture naming in L2 was faster than translation from L1 to L2 in both groups. In reference to L2→L1 translation, which is more relevant for our research, it was supposed that it is more likely to be accomplished lexically; with less semantics engaged in access than forward translation. L2 words are more strongly connected to their L1 translation equivalents than to conceptual access and which takes place via the L1 equivalents (Kroll & Stewart, 1994; Sholl, Sankaranarayanan & Kroll, 1995).

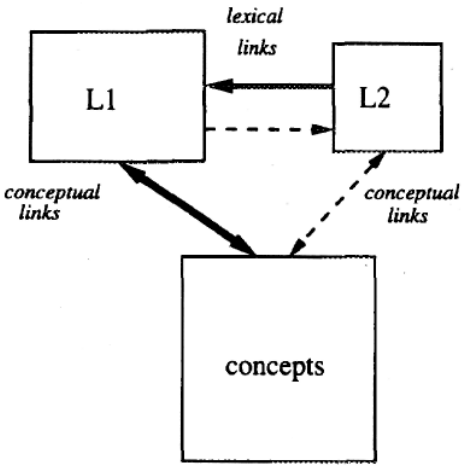


Fig.3 The Revised Hierarchical Model (adapted from Kroll & Stewart, 1994)

To explain the asymmetries in translation performance observed in late bilinguals who acquired L2 after early childhood and for whom the L1 remained the dominant language, and to merge effectively the models of word association and concept mediation, Kroll and Stewart (1994) proposed the Revised Hierarchical Model (RHM). According to this model both lexical and conceptual links are active in bilingual memory, but the strengths of the links depend on the fluency in the L2 and relative dominance of the L1 to the L2 (Kroll & Stewart, 1994: 157-158). In RHM (Fig.3), the L1 is considered to be "stronger' than the L2, since any bilingual knows more words in the native than in the second language (irrespective of the fluency in L2). Lexical associations from the L2 to the L1 are assumed to be stronger than lexical associations from the L1 to the L2. This is explained by the direction in which second language learners acquire the translations of new L2 words. The links between L1 words and concepts are assumed to be stronger than the links between L2 words and concepts. The main advantage of the RHM is that it captures the developmental change in linking between L1 and L2 words and lexical concepts. A more detailed assessment of the RHM is given in Kroll, van Hell, Tokowicz, & Green (2010).

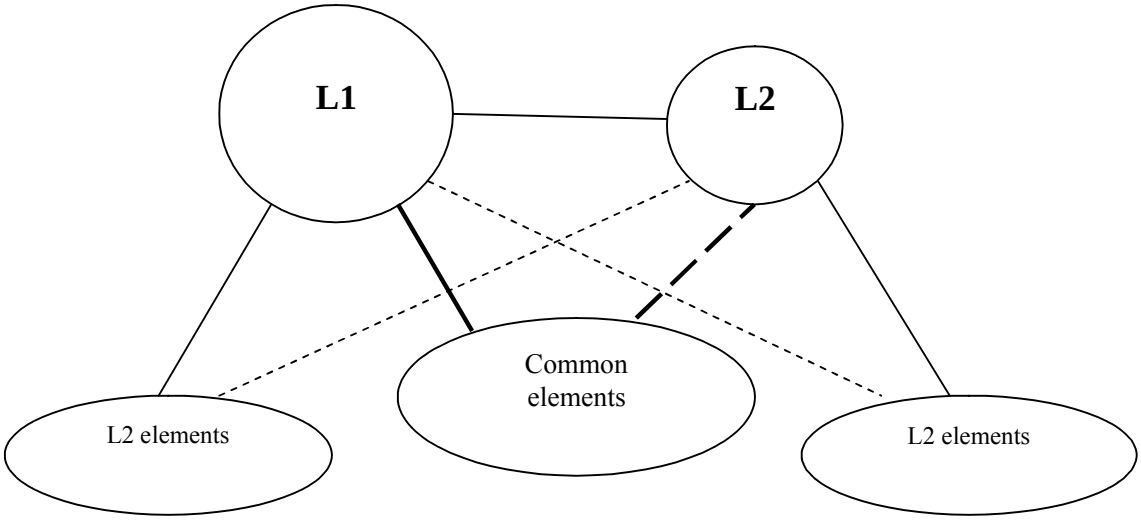


Fig.4 The Shared Asymmetrical Model (adapted from Dong, Gui, & MacWhinney, 2005)

Besides the above mentioned models of the lexicon, the Shared Asymmetrical Model (SAM) also deserves mention (Fig.4). The SAM proposes that the L1 and the L2 lexicons are linked to each other as well as to common conceptual elements, L1 elements, and L2 elements (Dong, Gui, & MacWhinney, 2005). The strength of the SAM lies in bringing together cross-linguistic differences and the vocabulary learning process. But the model does not give any clear description of the nature and structure of the conceptual representations.

Without doubt, all the existing models and theories of the structure of the mental lexicon are corroborated by experimental evidence. However, models of the mental lexicon in psycholinguistic studies rarely differentiate between conceptual and semantic levels of representation. None of the models above make this distinction. They are developed to explain the characteristics of memory storage, processing and activation and presuppose the common storage of conceptual and semantic representations. In monolinguals there is a direct one-to-one mapping between semantic knowledge and lexicalized and grammaticized concepts (Jarvis & Pavlenko, 2010). These concepts and knowledge are developed through experience with particular semantic constrains. Consequently, in research on monolinguals, semantic and conceptual representations are commonly examined via verbal labels (Barsalou, 2003) and used interchangeably to refer to an integrated semantic-conceptual system (Cruse, 2001; Francis, 2005).

Nevertheless, psychologists (Hampton & Moss, 2003; Murphy, 2002) and neurologists (Lecours &Joanette, 1980; Paradis, 1997, 2000) differentiate between conceptual knowledge (in the psychological literature "concepts" or "thought") and semantic knowledge (in the psychological literature "meanings" or "language"). The Modified Hierarchical Model

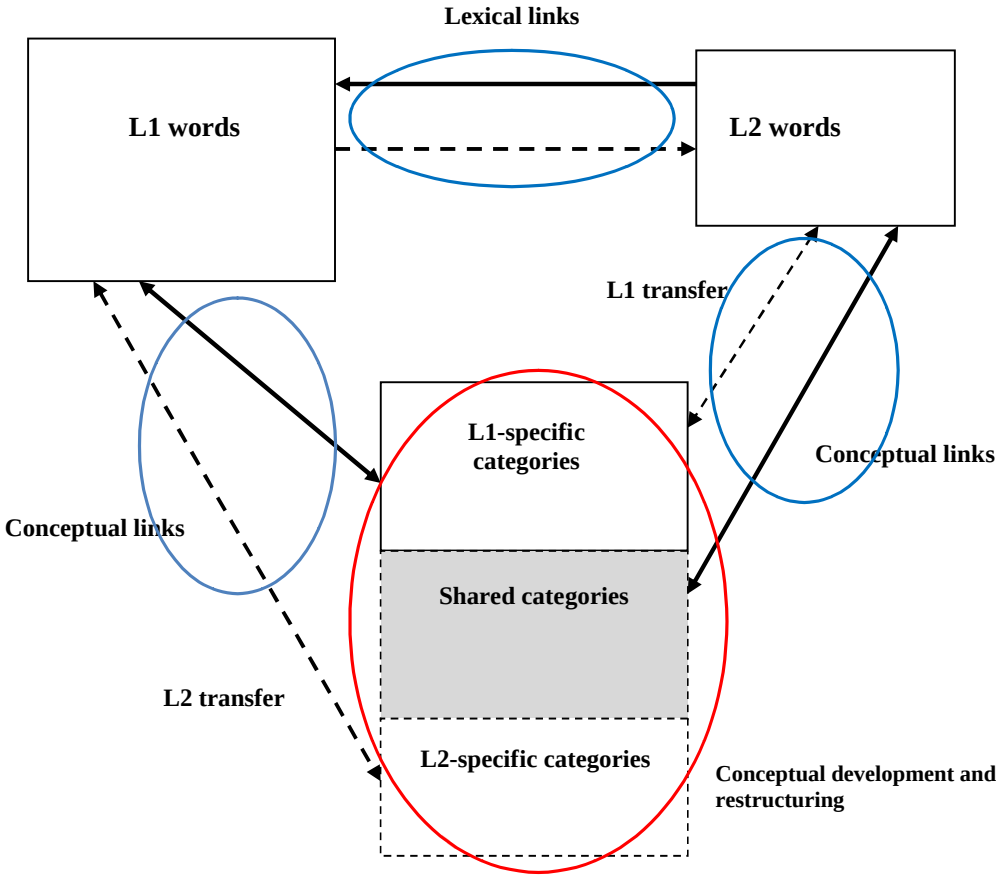


Fig.5 The Modified Hierarchical Model (adopted from Pavlenko, 2009)

(MHM, Fig.5) differentiates semantic and conceptual levels of representations (Pavlenko, 1999, 2009). This is especially important, since semantic and conceptual representations are the base for semantic and conceptual transfer during L2 usage or L1→L2 / L2→L1 translation.

The MHM differs from the three models above, while attempting to retain their strengths. Based on the RHM, the MHM retains the developmental sequence from lexical to conceptual mediation in L2 learning. In addition, it retains the notion of shared and partially representations central for the DFM and the SAM.

First of all, the HMH assumes that conceptual representations may be fully shared, partially overlapping, or fully language-specific (recognition of language-specific lexical concepts differentiates the MHM from the DFM and the SAM). The activation process, in this view, becomes a two-way interaction between the mind and the environment. Linguistic and social contexts activate concepts and frames, linked to one language, and inhibit the others, making them less relevant and accessible. The second feature is the recognition of the phenomenon of the conceptual transfer. This is possible since the model assumes a differentiation between conceptual and semantic levels of representation. The third important distinguishing feature is L2 learning, embedded in the HMH. The RHM presupposes a development of direct links between L2 words and concepts as the main goal of L2 vocabulary learning, whereas the HMH assumes conceptual restructuring and development of target-like categories to be the main goal of L2 learning (Pavlenko, 2009: 146-151).

The location of the conceptual representations in the Modified Hierarchical Model are marked in red in Fig.5, and the location of the semantic representations in blue.

2.3 Lexical Access and Language Activation in Bilingual Speech Production

In the previous section we discussed models of the bilingual lexicon which assume different ways of storage of multilingual information. However, the mental lexicon is not a "frozen" unit. People use the lexicon for perception, processing and production of the speech almost all the time. Different theories of the mental lexicon make contrasting predictions about lexical access.

The most remarkable ability of bi-/ multilinguals is that they separate their languages (two, or more) during the production of speech. Although the speech of highly proficient bilinguals in their L2 often carries traces of the L1 (accent or L1 syntactic structures), it rarely exhibits L1 lexical intrusions (Poulisse & Bongaerts, 1994; Poulisse, 1999). When necessary, bi-/multilinguals are very competent at selecting and producing words of only one of their languages. Three questions arise. The first question is how the activation of words in bi-/multilingual memory operates. The second question is what lexical access in bi-/multilinguals is. The third question is what mechanisms control lexical access in bilingual speech production. We will consider each of the questions in detail.

A principal step in language production is to retrieve words from the lexicon that match the communicative intention. The process by which this is achieved is often referred to

a lexical selection (Caramazza, 1997; Levelt, Roelofs, & Meyer, 1999; Levelt, 2001). This selection mechanism is necessary because it is believed that several lexical representations are activated at the same time due to spreading activation from any representation activated at the conceptual level to its corresponding lexical node and the lexical level. In the semantic system not only the word that matches the intended meaning is activated, but also other semantically and phonologically related items. The lexical selection mechanism is in charge of determining which of the activated lexical items has to be prioritized for further processing. In some models it is accepted that the level of activation of lexical nodes is the critical variable for deciding which element has to be selected. The word with the highest level of activation is usually picked out by the lexical selection mechanism. For example, if the bilingual intends to use the L2, L2 words receive more activation than the corresponding L1 words (La Heij, 2005). However, other models of lexical access assume that the selection mechanism is also sensitive to the level of activation of activated non-target lexical nodes (Roelofs, 1992). One influential model postulates that lexical access in bilingual speakers entails the reactive inhibition of lexical items belonging to the non-response language. The Inhibitory control model was offered by Green (1986, 1998) and was further developed by Hermans, Bongaerts, de Bot, & Schreuder (1998)

Inasmuch as we implement the lexical selection mechanism in the context of bilingual speech production, a very relevant question is whether the lexical nodes of all the languages of the bi-/multilingual are activated or not. The evidence suggests that during the course of lexicalization in even exclusively one language, the lexical nodes of all languages, a bi-/monolingual knows, receive activation (Levelt, 1989; Roelofs, 1992; Caramazza, 1997; Hermans, Bongaerts, de Bot, & Schreuder, 1998; Poulisse, 1999; Colome, 2001; Costa, Caramazza, & Sebastian-Galles, 2000; Gollan & Kroll, 2001). However, there are two opposite hypotheses about word activation in the bilingual memory. If we admit that the mental lexicon of a bi-/multilingual is organized on the basis of item characteristics, words from all languages might be activated, assuming language-nonselective access (Lukatela, Savic, Gligorijevic, Ognjenovic, & Turvey, 1978; Nas, 1983; Beauvillain & Grainger, 1987; Grainger & Beauvillain, 1987; Chen & Ho, 1986; De Groot, & Nas, 1991; Van Heuven, Dijkstra, & Grainger, 1998; Dijkstra, Van Jaarsveld, & Ten Brinke, 1998). However, if the mental lexicon is organized by language, then, in principle, only word candidates from the language that is contextually relevant are activated. This approach assumes language-selective

access (Macnamara & Kushnir, 1971; Obler & Albert, 1978; Scarborough, Gerard, & Cortese, 1984; Soares & Grosjean, 1984).

In the past decade, an increasing number of studies indicate that the activation of words in bilingual memory operates in a language-nonselective way (Jiang, 1999; Dijkstra, Grainger, & Van Heuven, 1999; Jared & Kroll, 2001; De Groot, Delmaar, & Lupker, 2000; Van Hell, & Dijkstra, 2002).

In a study by De Groot, Dannenburg, & van Hell, (1994) words were more quickly translated from L2 to L1 than L1 to L2, but the speed of translation in both directions was affected by the concreteness of the meaning of the words. Consequently, since translating is affected by the word meaning, the authors conclude that translation involves mediation on the conceptual level. The only situation when mediation on the conceptual level during translation does not play a role is the translation of close cognates. Close cognates tend to be translated so quickly since they have exceptionally strong formal links in the bilingual lexicon. The translation of cognates can take place directly on the lexeme level, not involving the associated conceptual representations (De Groot, Dannenburg, & van Hell, 1994). We consider this finding to be very interesting and useful for our research.

2.4 Translation from L3 to L1

The research that has studied bilingual processing and production has almost exclusively dealt with behaviour in an L2, not in an L3. Although L3 is an issue of discussion in studies of language acquisition, there are a few studies about L3 processing.

One study of trilinguals was conducted by van Hell & Dijkstra (1998). Trilinguals in their experiments performed a word association task and a lexical decision tasks in exclusively native contexts. Highly proficient in English and relatively low in proficiency in French Dutch native speakers provided shorter word associations and lexical decision times to L1 words that were cognates with English (L2) than to the noncognates. In these relatively low-proficiency French speakers, van Hell & Dijkstra did not find any difference in response times between French (L3) cognates and noncognates. French trilinguals with a higher level of fluency in French provided faster responses on the L1 words that were cognates with French than on the noncognates. These results indicate that words presented in the dominant language to native participants activate information in the nontarget, and weaker, language in parallel. Based on this, they argued for language-nonselective access and processing.

2.5 Intermediate summary

Mental links can be established between words within and across languages and within and across levels of representations (e.g. L1 lexeme to L1 lexeme, Kroll & Stewart, 1994;, L2 lexeme to L1 lemma, Jiang, 2000, 2002; or L2 lemma to L1 concept Jarvis, 1998). However, lexical representations and the links between them appear to be of varying strengths. The strength of the representation or link depends on factors such as frequency, how often the language is used, language proficiency, and concreteness of the meaning of the word (Jarvis & Pavlenko, 2010: 87-88).

Moreover, translation from L3 to L1 is hardly ever studied. The study by van Hell & Dijkstra (1998) concentrated on the influence of L3 on L2 on the response times in comprehension during a lexical decision task and an association task in L1. This study does not cover the influence of L2 and L1 on the translation from L3 to L1. Furthermore, no study has examined production. This study therefore attempts to fill this gap.

2.6 Predictions of this study

In the course of this study we examine the process of translation from L3 to L1 in unbalanced trilinguals. The participants are the native speakers of Russian with a very high level of proficiency in English (L2) who study/speak Swedish (L3). This study examines the relative influence of the L1 and the L2 on the translation depending on the level of proficiency in the L3.

Concerning the question of the relative influence of English and Russian on Swedish-Russian translation, we take into account that Swedish and Russian are typologically very different languages. Swedish is closer to English and it is reasonable to suppose that Swedish-Russian translation may be affected by English. Moreover, all the participants are highly proficient in English. They speak English in their daily lives and most of them study at the university in English. On the other hand, Russian is their native language and the basic concepts were acquired in Russian. Participants continue to communicate in Russian with their friends and parents (generally via skype). Moreover, Russian is the target language for translation.

Three groups of participants with different levels of Swedish proficiency took part in the study: beginners, intermediate, advanced. The first group is low proficient in Swedish. Most of the time they use Russian and English for the interaction with the external world. We

predict that the reaction times (RTs) of these participants will be the slowest among all the groups. We expect that the qualitative analysis of their data will show that their translation is significantly affected by English (L2) in comparison with other groups. Concerning the intermediate proficiency group we expect that their RTs will be faster and the influence of English will be smaller than in the first group. These participants spend more time studying and communicating in Swedish. Finally, we expect the advanced proficiency group to show the fastest RTs and the smallest effect of English. These participants mostly use Swedish for studying and communicating.

We devised an experiment with four sets of stimulus word types: noncognates, Russian-Swedish cognates, English-Swedish cognates, and Russian-English-Swedish cognates. We predict that Russian-Swedish cognates will be translated faster by all the participants than other types of words. We expect that English-Swedish cognates will be translated faster by the group of beginners and probably intermediate learners and slower by the advanced group. Since the advanced group more often communicate in Swedish, the influence of English may be less important. We assume that noncognates will be translated faster by the advanced group, slower by the intermediate learners, and most slowly by the beginners. Regarding the Russian-English-Swedish cognates it is very difficult to make any predictions, since no one has tested them as experiment stimuli. Two variants are possible: either they will be translated faster than all other stimuli (both Russian and English effects will speed up the translation in an accumulated fashion) or slower than all the others (Russian and English competing and slowing down the translation).

3. Method and analyses

3.1 Participants

Twenty-six unbalanced trilinguals with Russian as L1, English as L2, and Swedish as L3 participated in the experiment. All were students at the University of Lund. They were native speakers of Russian who started to learn English at school and continued at university. Some had studied or lived a few months in the United Kingdom or the USA. All the participants study or speak Swedish. Details on their language acquisition background were

collected through a language experience questionnaire (in Russian), filled in after the experiment session. The questionnaire provided information about:

1) languages known and the order in which they were acquired or studied. Initially, 30 people took part in the experiment, but the questionnaire revealed that participants also spoke also other languages and were subsequently excluded);

2) the context in which the participants learned the languages (where they study / studied Swedish and English) and the period they have been learning / speaking them;

3) level of proficiency in languages known and language exams passed (with grades);

4) the period of stay in Sweden;

5) whether participants had lived or studied in any English speaking country (with the duration of the stay);

6) time of usage of each language during the day.

Based on the self-assessed proficiency in Swedish (L3), participants were divided into three groups: beginners, intermediate, and advanced. The group of beginners consisted of 10 people. They were students, who had lived in Sweden for about nine months and who had studied Swedish for 3-5 months. Seven of them study Swedish in Komvux at the SFI course (Svenska för invandrare); three participants have finished the Basic Swedish course at the university and now continue by self-learning with help of the Rosetta Stone Swedish Course. Eight participants stated that they spend only 5% of their day using Swedish; two participants spent about 10% studying and practicing in Swedish. All of them rated their level of proficiency in Swedish as “beginner’s” or “basic”.

In the intermediate group there were also 10 people. They were university students, who live in Sweden for two years and who had studied Swedish for 1,5-2 years. Two of the participants studied Swedish at the university as one of the courses of their program; one participant studied Swedish with a private teacher. Some time ago they were tested in Komvux and now continue studying Swedish at the SvB level (Svenska som andraspråk B). Seven other participants had studied Swedish in Komvux from the beginning; they have finished the SFI course and passed the exam after it. Three of these participants have already finished also SvB course and passed Nationella Provet after this course; other participants continue to study at SvB level. Most participants stated that they use Swedish for 20-25% of the time, only two participants said that they spend about 40% of the time in Swedish (it is

explained by the fact that they live in apartments with Swedish-speaking tenants). All the participants rated their level of proficiency in Swedish as "intermediate" or "upper-intermediate".

In the third group, there were six students. They have lived in Sweden for 5-10 years. Graduating from the *gymnasium*, they have passed Nationella Provet and they study at the university in Swedish. They reported using Swedish 70-90% of the time.

We consider all the participants to be highly proficient in English, since in order to study at the University, as an admission requirement, they have passed an examination (with the exception of the participants of the third group). The participants passed either TOEFL or IELTS (the Academic Version). TOEFL (or the Test of English as a Foreign Language) evaluates the ability of an individual to use and understand English in an academic setting. IELTS (or International English Language Testing System) is an international standardized test of English language proficiency, jointly managed by the University of Cambridge ESOL Examinations and the British Council (the possible maximum is 9.0). The highest IELTS Band required by a university is 8.5 (by the Graduate School of Journalism at Columbia University), most IELTS requirements by universities fall between 5.5 and 7.0. The mean score of the participants for TOEFL was 105 points (the maximum score is 120 points). The mean score of the participants for IELTS was 7.0 points. The participants of the third group graduated from the *gymnasium* in Sweden and passed the English exam there with either the "VG" or "MVG" grade for this exam.

3.2 Materials and stimulus selection

The stimulus material for the experiment consisted of 50 Swedish words (Table 1). Ten words were cognates with their English translation equivalents, but not with their Russian translation equivalents. Hence, these Swedish words resembled their English translations in orthography, phonology, and meaning; e.g. ***potatis*** *– potato – картофель;* ***finger*** *– finger – палец*. Another 10 Swedish words were cognates with their Russian translation equivalents, but not with their English translation equivalents; e.g. ***biljett*** *– билет[bilʲet] – ticket;* ***kassa*** *– касса [kʲassa] – cash desk*. A third group of cognates were cognates in all three languages. These Swedish words resembled both English and Russian translation equivalents; e.g. ***schampo*** *– schampoo – шампунь [ʃampʲun];* ***lampa*** *– lamp – лампа [lʲampa]*. A further 20 Swedish words were noncognates resembling neither their English nor their Russian

translation equivalents in either orthography or phonology; e.g. ***hund*** *– dog – собака;* ***flicka*** *– girl -девочка*.

Table 1

Stimulus material

English Cognates (ECs)	Russian Cognates (RCs)	English Russian Cognates (ERCs)	Non Cognates (NCs)	
apple	apelsin	centrum	barn	hund
familj	apotek	fotboll	blomma	kärlek
finger	bibliotek	historia	byxor	kläder
klocka	biljet	idiot	cykel	kompis
land	dusch	kaffe	fika	lärare
natur	karta	lampa	flicka	nyckel
papper	kassa	modell	frisör	pojke
potatis	punkt	schampo	frukost	rabatt
sommar	reklam	schema	gata	regel
vinter	socker	student	gurka	sjukhus

The four word types were controlled for length in letters. Since the rules of syllable division are different among the languages, we measured word length in letters (M_{EC} = 5,7, SD_{EC} = 0,8; M_{RC} = 6,0, SD_{RC} = 1,2; M_{ERC} = 6,3, SD_{ERC} = 1,0; M_{NC} = 5,4, SD_{NC} = 0,9).

Stimuli were also controlled for frequency. Word frequency is a very important variable in lexical processing. More frequent words are easier to recognize and are responded to more quickly than less frequent words. Therefore the frequency of all the words and their translation equivalents was checked with CELEX (Baayen, Piepenbrock and Gulikers, 1995) and three other frequency electronic dictionaries: Språkbanken, SUBTLEXus and the Russian National Corpus. Språkbanken (The Swedish Language Bank) is a corpora consisting of newspaper texts, magazines, novels, plays, governmental texts, religious texts and dictionaries in Swedish (http://spraakbanken.gu.se/konk/). SUBTLEXus is a database which measures the word frequency of American English (http://subtlexus.lexique.org/). The Russian National Corpus (http://www.ruscorpora.ru/en/search-main.html) includes original (non-translated) works of fiction (prose, drama and poetry) and a large volume of sources of written and spoken language (memoirs, essays, journalistic works, scientific and popular scientific

literature, public speeches, letters, diaries, and documents). After the comparison of frequency data we got a list of one hundred words that could be used for the experiment.

All the existing corpora estimate the word frequency relying on written or spoken sources that are usually used by native speakers. However, word frequency in the standard language may not reflect frequency in bilinguals' and learners' mental lexica (see Davidson et al., 2008). Many textbooks of foreign language are arranged according to themes. Every theme contains a certain number of words that are learned and practiced with help of exercises. Frequent themes are food, house and furniture, clothes and daily routines. Therefore, we checked the comparative frequency of stimulus words in one of the popular textbooks (Göransson & Parada, 1997), which usually comes with the exercise book. It is used quite often as a course book for Swedish classes. Based on these comparisons, 50 stimulus words were selected for the experiment.

In addition to these 50 items, ten Swedish words, all different from any of the test stimuli, were selected as practice items: *jobb, hand, folk, kirurg, kvitto, klass, meter, flaska, korv, nivå.*

3.3 Apparatus and procedure

The experiment was run on an Asus Eee PC 1000H computer with attached screen (size 24 inch), programmed in ePrime experimental presentation software. A buttonbox with a voice key (activating voice-operated switch), amicrophone and a dictaphone were used as supplementary devices. All the participants were tested individually in the Humanities Lab of Lund University in a room equipped for sound recording. The participants were instructed to speak out loud, as quickly as possible, the translation of a stimulus word presented in written form on the screen. To exclude the provoked influence of English, all the instructions about the experiment and communication with the researcher were in Russian. We avoided any mention of English before the experiment session was over. Every trial was presented in a random stimuli order for each participant.

The procedure was as follows:

1) The instructions for the experiment appeared on the screen: "*Здравствуй! В данном эксперименте на экране ты увидишь различные слова на шведском языке. Слова будут появляться на экране по одному. Твоя задача как можно быстрее произнести громко и внятно русский перевод слова, которое ты увидишь на экране.*

Нажми клавишу «Пробел» на клавиатуре компьютера, чтобы начать эксперимент. Заранее спасибо. Удачи!" (Hello! In this experiment on the computer screen, you will see different Swedish words, presented one by one. Your task is to translate them as soon as possible into Russian and to pronounce the translation aloud. Press the button "Space" if you are ready to start the experiment. Thank you. Good luck!).

2) The instructions for the practice trial appeared on the screen: "*Начнем мы с пробного эксперимента, чтобы было понятно, как будет проходить основной эксперимент. Если ты готов(а), нажми клавишу «Пробел» на клавиатуре компьютера.*" (In order to make the procedure of the experiment clear, we are going to start with a practice trial. Press the button "Space" if you are ready to start the experiment).

3) A fixation cross appeared on the screen for 2 sec.

4) The target word was presented and remained on the screen until the participant responded. Ten practice stimuli were presented randomly. The maximum presentation time for a stimulus was 5 sec. Whenever this period expired without a response, we noted down the response "none" and the next stimulus was automatically presented. If participants did not know the translation they usually said "не знаю" (I don't know"). This respons was also registered as "none".

5) RTs were measured from the onset of the stimulus on the screen. The response was registered invisibly to the participant. A microphone activated a voice-operated switch and the RT was registered. The dictaphone recorded the responses of the participants; it was done in order to register not only the RT, but also to check the accuracy of the translations and to allow for later analysis of the content of the responses.

6) Two seconds after stimulus offset, the next stimulus was presented. We used this span to allow participants to say more than one word in case of corrections.

7) The message about the end of the practice trial and the beginning of the test trial appeared on the screen: "*Надеюсь, процедура тебе понятна. Сейчас мы переходим к основному эксперименту. Нажми клавишу «Пробел» на клавиатуре компьютера, чтобы начать эксперимент.*" (I hope that the procedure is clear for you. Now we pass from practice to the experiment. Press the button "Space" if you are ready to start the experiment).

8) The order of the test trial was identical to the practice trial: 2 sec. span → stimulus → response / "none" → 2 sec. span → stimulus and etc. Fifty test stimuli were presented randomly.

9) After last of the test trial, the message about the end of the test trial appeared on the screen: "*Эксперимент окончен. Спасибо, что принял(а) участие в нашем эксперименте.*" (The experiment is over. Thank you for participation.)

After the experimental session all the participants were asked to answer a language experience questionnaire (in Russian).

3.4 Analyses

First of all the RT data, registered by E-Prime (version 2.0), were supplemented with the translations, given by participants and registered with the dictaphone. All the data were sorted according to the type of stimuli (ECs, RCs, ERCs, NGs) and the groups of the participants (Beginner's, Intermediate, Advanced), and prepared for the analyses.

For each participant and for each item, mean word translation RTs were calculated for the cognates with English, the cognates with Russian, the cognates with both English and Russian, and the noncognates. False registrations due to voice-switch registration errors were excluded (0,61% of all data). Responses "не знаю" (I don't know") and incorrect translations were also excluded (4,92% of all data) and responses slower than 5 sec (0,69% of all data). In sum we excluded 6,22% of all data. Only the first translation given by the participants were considered in the quantitative analyses. For example, in the group of the intermediate learners there were cases when the incorrect translation was immediately rectified by the participant. In these situations we consider the translation incorrect. We further compared:

1) mean RTs for different groups of stimuli for each participant (only correct responses);
2) mean RTs of participants of different groups for different stimuli groups (only correct responses).

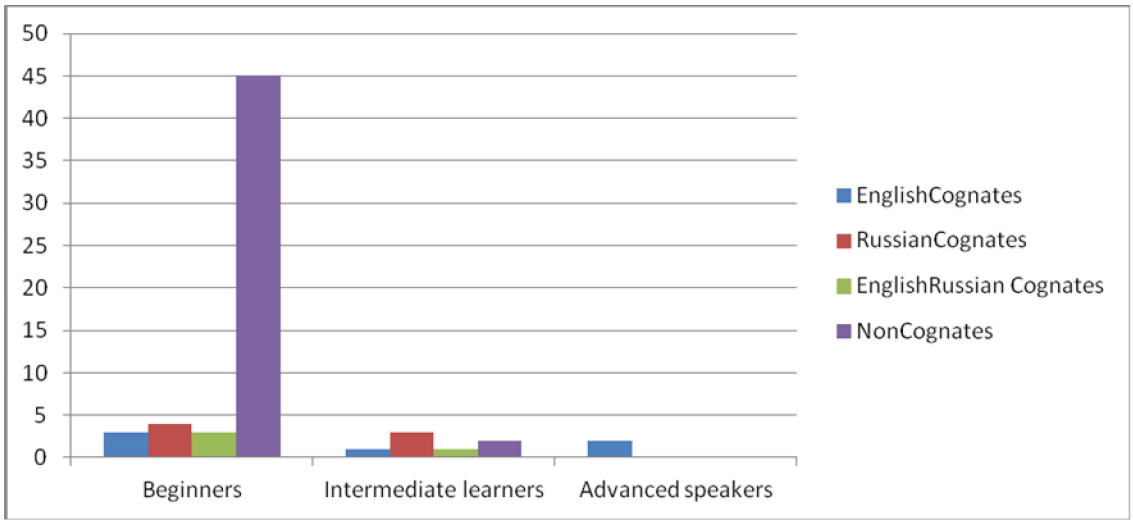
A repeated measures ANOVA was performed on the RTs followed by planned post hoc paired samples t-tests. Descriptive statistical analyses and qualitative analyses only were performed on the accuracy of the translations.

4. Results and Discussion

4.1 Results

The distribution of the number of incorrect translations over word types and participant groups is given in Fig. 6. The vast majority of mistakes were made by beginners during the translation of noncognates. As expected, the smallest number of mistakes was made by the advanced speakers of Swedish.

Fig. 6 The distribution of mistakes among the groups of the participants



A repeated measures ANOVA with group as the between-subject factor and word type as the within-subject factor was conducted to determine the effect of the level of proficiency and the type of the stimuli on the translation RTs. Mean reaction times of the experiment are presented in Table 2, and Fig. 7 and 8 and the outcome of the ANOVA in Table 3.

The analysis shows a significant main effect of word type on the translation RTs, $F(3,25)=31,869$; $p<.000$. There is also a significant interaction with proficiency group, $F(6,52)=2,838$; $p=.018$. The participant groups thus behaved differently with regard to the word types.

Table 2

Mean Reaction Time (msec)

Groups →	Beginners		Intermediate learners		Advanced Speakers		Total	
Stimuli Types ↓	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
NonCognates	1402,3000	351,70065	1445,0000	205,12760	1063,9000	233,38830	1303,7333	313,71434
EnglishCognates	1265,6000	252,05872	932,5000	155,92751	1073,6000	121,19974	1090,5667	226,05487
RussianCognates	1023,3000	130,39858	797,8000	113,63568	924,5000	95,61991	915,2000	144,686220
EngRusCognates	1295,5000	1032,83797	806,5000	144,22995	890,1000	125,10746	997,3667	624,14280

Fig. 7 Mean Reaction Time of different types of stimuli (msec)

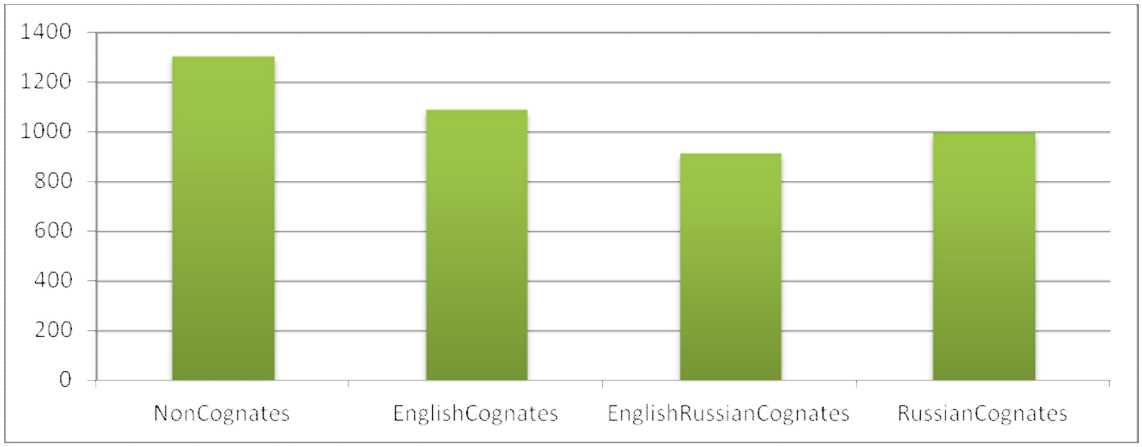


Fig.8 Mean Reaction Time of different groups of participants (msec)

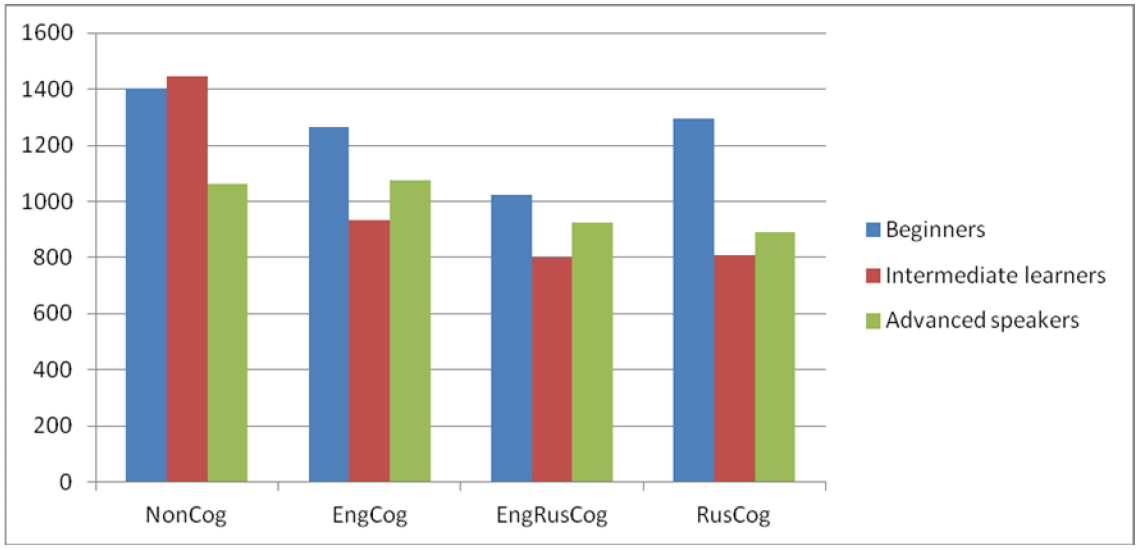


Table 3

Multivariate Tests

Effect		Value	F	Significance
Stimulus type	Pillai's Trace	,793	31,869[a]	,000
	Wilks' Lambda	,207	31,869[a]	,000
	Hotelling's Trace	3,824	31,869[a]	,000
	Roy's Largest Root	3,824	31,869[a]	,000
Stimulus type X Group of participants	Pillai's Trace	,493	2,838	,018
	Wilks' Lambda	,544	2,969[a]	,015
	Hotelling's Trace	,772	3,086	,012
	Roy's Largest Root	,670	5,807[b]	,004

Table 4 shows the results from the post hoc paired samples tests (adjusted alpha level to .025) which revealed that:

1) beginners were significantly slower to respond to English cognates than were intermediate learners (p=.000);
2) beginners were significantly slower to respond to English cognates than were advanced speakers (p=.003);
3) intermediate learners were significantly faster to respond to English cognates than were advanced speakers (p=.000);
4) beginners were significantly slower to respond to English-Russian cognates than were intermediate learners (p=.001);
5) intermediate learners were significantly faster to respond to English-Russian cognates than were advanced speakers (p=.024);
6) beginners were significantly slower to respond to noncognates than were intermediate learners (p=.000);
7) beginners were significantly slower to respond to noncognates than were advanced speakers (p=.001);

Table 4

Paired samples t-test

	Mean	Std. Deviation	Std. Error Mean	Lower	t	*P*
beginEC - intermedEC	333,10000	140,85252	44,54148	232,34017	7,478	,000
beginEC - advEC	192,00000	148,41458	46,93281	85,83060	4,091	,003
intermedEC - advEC	-141,10000	63,17427	19,97746	-186,29215	-7,063	,000
beingERC - interERC	225,50000	152,83197	48,32971	116,17059	4,666	,001
beingERC - advERC	98,80000	117,05535	37,01615	15,06365	2,669	,026
interERC - advERC	-126,70000	147,63623	46,68667	-232,31259	-2,714	,024
beginRC - interRC	489,00000	901,42714	285,05629	-155,84213	1,715	,120
beginRC - advRC	405,40000	974,77840	308,25200	-291,91446	1,315	,221
interRC - advRC	-83,60000	107,98066	34,14648	-160,84471	-2,448	,037
beginNC - interNC	383,75000	219,35860	49,05008	281,08701	7,824	,000
beginNC - AdvNC	309,55000	346,89032	77,56703	147,20033	3,991	,001
interNC - AdvNC	-74,20000	302,15726	67,56442	-215,61395	-1,098	,286

4.2 Discussion

4.2.1 Relative influence English vs. Russian

Based on the previous findings in support of nonselective access to the mental lexicon and common-store lexicon model we expected to find crosslinguistic influence of all three languages in trilinguals on the process of translation from L3 to L1. Our aim was to find out what the relative influence of English and Russian is in this process. The analysis of the data showed a very significant effect of word type on the translation RTs. Cognate advantages were obtained and cognates were translated faster than noncognates. Russian-Swedish

cognates were translated faster than English-Swedish cognates, but English-Russian-Swedish cognates were the fastest for translation. These findings have a number of important implications for theories about the activation and organization of words in multilingual memory, which we will discuss now.

According to the language mode concept, the relative activation and the degree of language selectivity of multilinguals' language systems depends on whether they find themselves in a more monolingual or bilingual situation (see Grosjean, 1997). We tried to exclude the provoked influence of English. Our participants were asked to translate the stimuli from Swedish into Russian. All the instructions and communication with the researcher were in Russian. Yet, we found a significant effect of English in our data.

Theoretically, our finding that L2 knowledge affects the translation from L3 to L1 provides strong support for the theoretical position that the language processing system of multilinguals is profoundly nonselective with respect to language. Presentation of a word in one language automatically activates words from all the other languages in parallel. Most remarkably, the effect on L1 translation was found even though the majority of the cognates in our experiment were nonidentical across languages in terms of both their orthography and their phonology (e.g. EG: klocka – clock; ERG: centrum – centre – центр; RG: biljet – билет). Unlike in many previous studies, in which identical cognates or identical homographs were used (e.g. De Groot et al., 2000; Dijkstra et al., 1998), our stimuli were unambiguous with respect to the languages to which they belonged.

Thus, Swedish words activated in parallel not only the Russian translations, but also phonetically related candidates from the L2. For example, the word *socker* activated not only the Russian translation *сахар*, which is a cognate, but also the English words *socks* (in Russian *носки*) and *soccer* (in Russian *футбол*). In most of these cases, participant corrected themselves immediately and said the Russian translation. So, the data also provide evidence for phonological co-activation (see Nas, 1983; Dijkstra, Grainger & van Heuven, 1990; Doctor & Klein, 1992). It is interesting, that the majority of these cases were found in the data of beginners. The fact that most of these participants earlier studied or lived in the USA or the UK (6 months – 2 years) also should be taken into consideration.

An important aspect of this study is the findings concerning Russian-English-Swedish cognates. Since such triads had not previously been studied, predictions regarding translation speed could have gone either way. However, Russian-English-Swedish cognates

showed the shortest translation latencies. The design of our experiment does not permit us to give a precise answer to why the translation of Russian-English-Swedish cognates is faster than Russian-Swedish cognates or English-Swedish cognates. We can only conjecture. De Groot et al. (1994) came to the conclusion that cognates are translated faster because they have strong formal links, and they can be translated on the lexeme level, without access to the conceptual representations. But this does not explain why Russian-English-Swedish cognates are faster translated than other types of cognates. Williams and Hammarberg (1998) and later Hammarberg (2001) investigated a learner of Swedish with prior knowledge of English (native), German, French, and Italian. They came to conclusion that the strong background activation of one language (in their case it was German) over the others (including native) could occur because the learner was highly proficient in this language and used it very often. In our experiment we found that English-Swedish cognates were faster translated than Russian-Swedish cognates by the group of beginners, and relatively fast by the intermediate learners. Both groups translated Russian-English-Swedish cognates faster (in the case of intermediate group not significantly) than Russian-Swedish cognates. We assume that this is caused by the constant use of both Russian and English during their daily life. Most of the beginners and intermediate learners mentioned that they use English more or equally often than Russian, most of them spent a lot of time abroad in English-speaking countries. That is why we conjecture that the links of both languages are activated and speed up the process of translation. This issue clearly needs further study. Concerning the RTs of the advanced group on different types of stimuli, we predicted the minor effect of English, which was borne out. The advanced participants translated Russian-Swedish cognates and noncognates faster than English-Swedish cognates and Russian-English-Swedish cognates. In addition, Russian-English-Swedish cognates were translated faster than English-Swedish cognates. We think that this is more the merit of Russian; the RTs of Russian-English-Swedish cognates and Russian-Swedish cognates are almost similar.

In the final analysis we can say that there is a significant influence of both Russian and English on the process of translation in the data of our research, but this influence varies depending on some factors: proficiency in Swedish, frequency of stimuli and the frequency of English, Russian, and Swedish use during daily live.

4.2.2 Proficiency factor

The proficiency of participants has appeared to be the key factor with translation latencies being affected by how proficient the participants are. We expected that the RTs of beginners would be the slowest among all the groups. We predicted that intermediate learners would be faster than beginners, but the fastest RT we expected from the group of advanced speakers. Not all of these predictions have come true (Fig.7 in Results).

Beginners were really slower in translating from Swedish into Russian, but the RTs of beginners were insignificantly longer for translation of Russian-Swedish cognates. According to the Paired samples test the difference in translating of Russian-Swedish cognates among all the groups was not significant. In contrast, differences were found in the translation of English and English-Russian cognates of Swedish words. The fastest RTs were shown by intermediate learners.

There are interest effects for individual words. For the noncognate stimuli, the mean RT=1445ms in the group of intermediate learners is influenced by the RT of two words (*fika* and *frisör*). These two words will be discussed further. When these two items are removed, the mean translation RT for noncognates in intermediate learners is reduced to 1040ms. We find the evidence for this in the Paired samples test. Its data shows that in general intermediate learners were faster than advanced speakers, but insignificantly. Thus, our predictions that advanced speakers are fastest translating from Swedish to Russian was not borne out. They are faster than beginners, but almost all the time they are slower than intermediate. We see two reasons for this.

First of all in comparison with other participants, advanced speakers rarely use English. They study at the university in Swedish and use English only for communicating with some friend, and occasional reading books and watching TV programs. English is therefore presumably not very highly activated. That might explain why English cognates were translated almost as noncognates, whereas translation of Russian and Russian-English cognates was faster. The other possibility is that they use Russian less than all the other groups. It was difficult for them to find the Russian word for a certain object (which they often showed with gestures). They seemed to find Russian translations easier and faster if these translations were similar to the Swedish stimuli.

Summarizing, beginners were the slowest translating the stimuli. They are the least proficient in Swedish, the links between Swedish words and Russian words and concepts are not very strong and it takes more time for them to translate from Swedish into Russian. Intermediate learners were the fastest translating the stimuli. In their everyday life they use English, Russian, and Swedish; they spend quite a lot of time studying and practicing Swedish and English. Thus, the links between Swedish, English and Russian are stronger and they faster give the Russian translation. We have found that advanced speakers are slower in Swedish-Russian translation, presumably because they use more Swedish in their daily live and less Russian and English, weakening activation and presumably the links between languages. We can assume that they have stronger links between Swedish words and the concepts in their mind.

4.2.3 An excursion on phonological co-activation

The purpose of any psycholinguistic study of crosslinguistic influence is to investigate the processes underlying transfer. A fundamental question is how (when, where and why) language users make mental associations between elements of the different languages that they are learning or already know. Even though we cannot directly study the mental processes (through which the connections are initially made), we can scrutinize when (under which circumstences) and where the specific instances of transfer occur. Although the current experiment was not designed to probe phonological interference, qualitative analyses suggest cases of phonological transfer.

The examples of phonological transfer were found only in the group of advanced speakers. In translating stimuli they sometimes borrowed the pronunciation of Swedish words, e.g. **apotek** → *апотека* [apOteka] instead of *аптека* [apteka], **bibliotek** → *библиотэка* [bibliotЭka] instead of *библиотека* [bibliotEka] ([э] and [e] sounds are very different in Russian); **schema** → *шхема* [ʃhema] instead of *схема* [shema], **socker** → *сахер* [saher] instead of *сахар* [sahar].

In the experiment we used the word *fika* as a stimulus. This word was difficult to translate for the participants. They spent a lot of time trying to find a proper Russian word. In Russian there are several words that can be used for its translation. But all these Russian words do not reflect all the peculiarities of *fika*. It seems interesting that most of the beginners and three of the intermediate learners translated this word by transliteration *фика* [fika], while

advanced speakers and other intermediate learners found Russian words that are close in their meaning to *fika* : *чаепитие*, *полдник*, *перерыв на кофе*. The RT of the translation *fika* was much shorter than the RT of other translations. We considered the translation *фика* to be correct, since most of the Russian speaking students use it every day without translation but with Russian pronunciation (the musical stress is changed to the simple one). So, here we have an example of borrowing the whole word from Swedish into Russian and changing its pronunciation.

There were also a lot of examples of English influence on the process of translation from Swedish into Russian. Most of them can be defined as lexical transfer. We distinguish this kind of transfer from phonological one, since the participants used false cognates in English and translated them into Russian. Some of the participants corrected themselves almost immediately and gave the right translation word. For example: **gata** → *ворота* (gate); **socker** → *футбол* (soccer); **frisör** → *морозилка* (freezer); **hund** → *рука* (hand). The most of the examples of this kind of transfer were given by beginners. Seldom, they can be found in the responses of intermediate learners.

The stimulus **land** was translated either *страна* (country) or *земля* (land). Both translations are correct, but in Swedish dictionary the first meaning of this word is *страна* (country). We assume that in the translation of this word we have a meaning transfer, and participants (this transfer was only among beginners) were affected by English word *land* (*земля* is the first meaning for this word). Indirectly, it can be proved by the fact that neither intermediate learners nor advanced speakers used this translation. In the responses of intermediate learners we have not found a lot of examples transfer, but it does not mean that there was no crosslinguistic influence in their case. Our experiment was not designed for studying the peculiarities of crosslinguistic influence on different linguistic levels. That is why the responses of this group cannot be used as conclusive evidence for defining the types of transfer, but we shouldn't neglect crosslinguistic evidence in their translation.

4.2.4 Word frequency

The literature shows that word frequency influences word processing in monolinguals. In the stimuli selection, we selected both high-frequent and low-frequent words. However, because learners may not have the same internal frequencies as the standard language, we expected no difference in the RT for high-frequent and low-frequent words

according the Språkbanken. That is why we used the textbook På svenska! 1 (Svenska som främmande språk) to estimate relative frequency of the stimuli for the participants in the experiment.

Comparing the data, from Språkbanken and the textbook, some words are not frequent in Språkbanken, but very often can be found in the textbook in comparison and vice versa. For example, “apple”, “frukost” and “klocka” are low frequent words in Språkbanken; “punkt” and “reklam” are much more frequent. But in the textbook, “apple” (9 times), “frukost” (20 times) and “klocka” (32 times) can be found often, and “punkt” (once) and “reklam” (once) seldom. If learners’ frequencies reflect words encountered in textbooks, their RT to “apple”, “frukost” and “klocka” should be shorter, than to “punkt” and “reklam”. And this was indeed found in the RTs of beginners. It is especially noticeable in the RTs of noncognates. For example the words *frukost*, *pojke*, *cyckel*, are low-frequent in Språkbanken but relatively frequent in the textbook, *barn*, *lärare*, *sjukhus* are high-frequent; the RTs of all of these words are almost equal. The RT of a frequent word in Språkbanken *flicka* in the beginners group was slower than the RT of *gurka*, which is very low-frequent in Språkbanken, but not in the textbook. Thus, choosing the stimuli for the experiment with the beginners it is important to take into account that the word frequency from Språkbanken does not always work for them. The necessity of multiple data sources for selection of stimuli for experiments with multilinguals is considered in detail by Davidson et al. (2008). The reverse situation was observed in the groups of intermediate learners and advanced speakers. We did not find the evidence that their RT differs considerably from the frequency level of stimuli in Språkbanken. High-frequent words were usually faster translated.

The RT can also be affected by the frequency of Russian words. It has appeared that for example, the word *frisör* was translated slowly, because participants felt difficulty to find and pronounce the Russian word *парикмахер*. This word is very long and complicated. A similar situation was observed with translation of *schema*. If participants translated it with the Russian cognate *схема* the RT was fast, if they translated it with Russian word *расписание*, which is also correct, it was considerably slower.

5. Conclusion

This study examined two research questions: 1) What is the relative influence of English vs. Russian on the process of translation from Swedish into Russian? 2) How does the influence of English and Russian differ, depending on the proficiency in Swedish? The results suggest that the relative English vs. Russian influence varies among groups of participants and depends on their proficiency in Swedish. We predicted that the RTs would be shorter the higher the proficiency level of participants, and the relative influence of English would be less strong the higher the proficiency level of Swedish. Not all these predictions were borne out.

Beginners were really slower in translation than intermediate learners and advanced speakers. Their data show the significant influence of English on the translation from Swedish into Russian. In contrast, the predictions concerning intermediate learners and advanced speakers were not supported. Advanced speakers were slower than intermediate learners. This situation is probably caused by the fact that the relative influence of both Russian and English is smaller in their translation in comparison with intermediate learners. The translation of intermediate learners is affected very much by all languages. We assume that the links between words of languages and concepts are very strong and faster activated in this group since they use all the languages regularly and in a sufficient amount. Beginners use Swedish quite rarely, therefore the links between English and Russian are stronger than between Russian and Swedish. We think that in their case, links with English words were activated faster and speed up the translation. The advanced speakers, in contrast, use Russian and English more rarely than the other participants. We assume that as a result of this the links between Russian, Swedish and English words and concepts have become weaker. Reading Swedish words on the screen they identified quite fast them, but it took a lot of time for them to find Russian equivalents.

Our finding that L2 knowledge affects the translation from L3 to L1 provides strong support for the theoretical position that the language processing system of multilinguals is profoundly nonselective with respect to language. Presentation of a word in one language automatically activates words from all the other languages in parallel, but the strength of links which are activated is different. That is why we observe different response times. Moreover, it is not clear that translation of cognates is not conceptually mediated. Qualitatively, we could

observe during the experiment session that participants sometimes identified words faster than they could find the proper translation. It seems necessary and interesting to follow up the study of the cognate effect in trilinguals, with further experiments testing with the involvement of L2 cognates. It is important to find out if this latency is caused the conceptual mediation or it is the result of competition between cognates of different languages. Furthermore, phonological and semantic effects may be teased apart in future experimentation to further probe of effects found in advanced speakers of Swedish.

To conclude this study has shown that even when multilinguals translate from L3 to L1, their translations are influenced by their knowledge of the L2 and as well as of the L3. The strength of the influence depends on the proficiency in the L3 and relative usage of all three languages.

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