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Concepts and contexts – the effect of cross-cultural differences on bilingual speech

Bilingual language processing is an intricate interplay between a number of regulating factors and mechanisms. The current paper aims to explore what triggers code-switching in the speech production of a fairly balanced English-Hungarian early bilingual. The analysis is carried out within a framework based on conceptual equivalence relations. An additional aim of the current study is to explore the multiple effects of language-specific lexical concepts on bilingual speech in context. Data come from a case study of an 11-year-old early bilingual participant with considerable experience in single-language contexts. The effect of cross-cultural differences is investigated through the analysis of code-switched elements and loan translations retrieved from two interviews revolving around cultural topics. Data suggest a positive correlation between the levels of conceptual equivalence relations and the significance of contextual factors. The study also reveals a potential connection between the co-occurrence of instances of code-switching and loan translations.

Keywords: childhood bilingualism, early bilingual speech production, conceptual representation, cross-linguistic differences, code-switching

1. Introduction

Cross-linguistic phenomena are a natural characteristic of bilingual speech. While fairly balanced early bilingual children experienced in single language contexts may generally be successful in maintaining the target language if the context requires so (Han et al., 2022, pp. 879–880), their speech production might be no exception when it comes to retrieving and giving an account of life events encoded in the non-target linguistic context or discussing culture-specific topics in the incongruous language (Pavlenko, 2009; Schrauf et al., 2003).

Bilingual speech is the result of a variety of underlying mental processes, governed by internal and external factors (Grosjean et al., 2013, p. 55). External factors are the demands of the communicative setting and the typology of the speaker's languages. Internal factors include the level of activation of each of the speaker's languages at the moment of speaking, or the speaker's prior experience, or lack of experience, in using their languages in various contexts and for a variety of purposes. Some factors, such as the specifics of the communicative setting and the speaker's ability to recognise them and change communication accordingly, affect bilingual communication in general, i.e., regardless of what languages are involved. Other factors are language-specific, therefore need to be examined in

the context of cross-linguistic relations. Concepts that carry cultural content, for instance, fall in the latter category. They may be culture- and language-specific, and if this is the case, they may impose constraints on bilingual speech, resulting in various speech disfluencies ranging from filled and silent pauses, hesitations, false starts, etc., to more explicit forms of cross-linguistic interference, such as loan translations or code-switching.

The current paper explores how cross-cultural differences affect bilingual speech in interactions in the English and Hungarian contexts. The particular focus of the study is code-switching in light of language specificity. In addition, it investigates the variation of language use across the speaker's languages as reflected in the occurrence of loan translations and code-switched elements. The paper is theoretically grounded on various models of speech production, with a primary focus on Pavlenko's Modified Hierarchical Model 2009 as well as her conceptual equivalence framework.

1.1. Models of speaking and the role of conceptual representation

It is very rare for a bi- or multilingual person to be equally proficient in all of their languages (Grosjean et al., 2013). A variety of factors influence language dominance. The time and manner of language acquisition and the experience of using each language for different purposes and in different modalities contribute to the speaker's language history. When researching the speech production of a multilingual person, information about the status of the speaker's languages at the time of speaking is crucial. The Complementarity Principle (Grosjean, 2015) explains how the distribution of each language across different domains of life affects the frequency of use and fluency as languages of the bilingual individual are used in harmony with the partner in communication, the setting, the topic, etc. The level of activation of the speaker's languages moves on a continuum (c.f. the Language Mode model, Grosjean, 2001), with monolingual language mode towards one end, and bilingual mode towards the other. Depending on the demands of the interactional setting, there may be a rapid change in the languages the speaker chooses to use (Grosjean et al., 2013, pp. 7–20).

Language production and language choice are the result of a complex process. Decades of research into speech production have produced various models to describe the mental lexicon and illustrate the cognitive processes behind oral communication. Levelt's model (1989) was instrumental in conceptualizing the process in a modular form, introducing the notions of conceptualizer, formulator, and articulator.

Since this early model was meant to describe monolingual speech, eventual modifications have been suggested to cater to the bilingual features of speech production. The conceptualiser is a stage where the process is identical regardless of the number of languages, since here the original idea is generated in a pre-verbal form (Levelt, 1989, p. 9). However, once the speaker starts the search for

the appropriate lexical concept, the selection is inevitably language-specific. This is the very locus where the monolingual and bilingual processes diverge because, in the case of bilinguals, corresponding lexical concepts in both of the speaker's languages are activated (Green, 1998; Costa, 2005). The conceptual category of the selected language inevitably increases the level of activation of the corresponding lexical items, although the competing concepts from the non-target language are also available, with a lower level of activation (Navracsics, 2010). According to the needs of the communicative context, the incongruent concept must be inhibited before the congruent one is selected. To allow for the previously described stage, it was suggested that an additional module, the verbalizer, be introduced between the conceptualizer and the formulator (Kroll & Stewart, 1994; de Bot & Bátyi, 2022).

In the context of any language pair, the process may be further complicated depending on the potential cross-cultural differences and their linguistic representations. Lexical access in speech production may be significantly affected by the availability or lack of conceptual equivalents. The decisions made by the speaker in such cases may reveal important information about the mental processes behind language production.

To account for such processes, Pavlenko's Modified Hierarchical Model (2009) provides a further elaboration of previous models and synthesises insights from both mental lexicon and speech production frameworks. What makes this model distinctive is its expansion of the verbaliser stage by explicitly addressing the potential difficulties bilinguals encounter in language choice. Pavlenko argues that the selection of a language-specific lexical item corresponding to a preverbal conceptual representation is not always straightforward, particularly in cases where cross-linguistic differences in conceptual representation complicate the mapping process. The central innovation of the Modified Hierarchical Model is the inclusion of a conceptual store that encompasses representations from both languages. These representations are organised into three categories based on their degree of equivalence across languages: full equivalence, where concepts overlap entirely; partial (non-)equivalence, where there is only partial overlap; and non-equivalence, where a concept in one language has no direct counterpart in the other.

In the case of full equivalence, the lexical concepts in the two languages point exactly to the same referent, indicating that this case may be the least demanding on the bilingual brain while planning speech. In the Hungarian-English language pair, such fully equivalent concepts are *cat* and *macska*, *street* and *utca*, or *submarine* and *tengeralattjáró*. According to De Groot's bilingual representation model (1992), as well as in Pavlenko's model (2009), these concepts share all their conceptual features across languages.

In contrast, partial equivalence may present some difficulty for the speaker, as only some of the conceptual features are shared. In this case, the corresponding

lexical concepts may overlap with respect to certain elements but diverge concerning others, so additional explanation is needed once a conceptual transfer happens across the languages. One example, with a pinch of social and cultural flavour, is the phrase *to be on holiday/szabadságon lenni.* While both contain the conceptual element of being away from work, what one does during this period differs. For the British, it involves travelling, while for Hungarians, it may as well mean simply staying at home. Another example of partial equivalence is *asztal* and *desk*/*table.* Whereas the word *asztal* in Hungarian carries a basic meaning, it points to the category of table, which encompasses subcategories such as *desk*, *dining table,* and *coffee table*, that are distinct categories in English. One may argue that the word *íróasztal* corresponds to *desk*, but in reality, *asztal* is replaced by *íróasztal* only in cases where the speaker specifically wants to emphasize what type of furniture they are referring to. One last example for partial equivalence is *bottle* and *üveg*/*palack*. The English word *bottle* may refer to both glass and plastic containers for liquids, whereas Hungarian has two distinct categories, one for containers made of glass (üveg) and one for containers made of plastic (palack). Having said this, it is worth mentioning one exception: *kólásüveg* (bottle of Coke, *üveg* = glass container) is a common name in everyday language usage even when denoting a plastic container (here, common usage has kept the original term from the times when the fizzy drink came exclusively in bottles made of glass).

Owing to cultural differences, certain lexical concepts in one language may have no equivalent in the lexical set of the other. In Pavlenko's model, these are referred to as instances of conceptual non-equivalence. Specific terms pertaining to culturally defined items (Santa Claus), events (Glastonbury Festival), or institutions (Covent Garden), as well as culinary terms (roast dinner), and holidays (Guy Fawkes' Day) are likely candidates for this category.

Conceptual partial equivalence and non-equivalence require extra cognitive effort from the bilingual; therefore, both affect fluency. As a consequence, they may result in dysfluency phenomena, such as hesitation, false starts, or self-repair. More importantly, such cases may trigger more explicit forms of cross-linguistic influence, such as loan translations and code switching, especially in interaction, where planning takes place under serious time constraints. Loan translations are literal translations of concepts from the non-target language (Backus & Dorleijn, 2009, p. 75), while code switching is the use of two or more languages in one utterance. The two latter phenomena are at the focus of the present study, examined in light of equivalence relationships.

1.2. The present study

The current paper is based on a case study designed to investigate conceptual representation in the context of English and Hungarian, through the analysis of bilingual speech in a non-experimental setting. Adopting an exploratory and interpretive approach, it seeks to examine the mobilization of conceptual

representation in conveying congruent, partially congruent, and non-congruent notions with code-switches and loan translations in the speech of an 11-year-old English-Hungarian early bilingual individual. The introduction of the cross-cultural element in the research design is intended to shed light on the nature of language choice strategies and the factors that trigger certain types of representation.

Two main research questions will be addressed:

1) What factors motivate code-switching within the three categories of conceptual equivalence in the bilingual mode?

2) What do instances of loan translation reveal about the nature of conceptual categories in the bilingual mental lexicon?

2. Methods

2.1. The participant

The participant is an 11-year-old Hungarian-English early bilingual child. The selection of the participant was motivated by the fact that she has lived in two different countries, the UK and Hungary, becoming familiar with both cultures and fluent in both Hungarian and English. Born in the UK to Hungarian parents, she was raised with a strong sense of Hungarian identity, Hungarian being the only language used at home. Admission to nursery school at the age of three marked the official onset of her language acquisition in English. One distinctive feature of the participant's language trajectory was the parents' clear determination to eliminate all traces of English influence from her Hungarian, e.g., consistently correcting English phonemes and patterns of intonation in the child's Hungarian utterances. This attitude toward the child's language development was motivated by the parents' intention to eventually relocate to Hungary, which they did when the child was aged 10. The interview was carried out one year after the family moved to Hungary.

As is often the case, the participant's language use was distributed between various domains of her life. While residing in the UK, she used exclusively English at school, and exclusively Hungarian at home. Owing to this distribution, she had gained considerable experience in using her languages in single language mode (Grosjean, 2001), i.e., expressing herself in one language while trying to deactivate the other.

2.2. Data collection

Data was collected in three phases, using two types of instruments. First, a parental version of the LEAP questionnaire (Kaushanskaya et al., 2020) was used to assess the participant's language acquisition history and language constellation. Secondly, an extensive interview was carried out with both parents to reveal the particular features of the child's language socialization, such as the circumstances

of language acquisition of both of her languages, family language policy, family language use, and the parents' language attitudes.

The first two phases of data collection informed the final phase, which consisted of semi-structured interviews carried out with the child in both of her languages separately, on two different occasions, four days apart. The interviews were conducted by the same English-Hungarian bilingual interviewer at the participant's home in Hungary. Although the participant was asked to use one of her languages on each occasion respectively, it was not explicitly stated that she could not use the other. In this respect, the child may have been in the bilingual mode while trying to keep herself in the single language context.

Methodologically, the interview format offers similar advantages to narrative elicitation tasks for the study of bilinguals' linguistic categories. On one hand, it ensures ecological validity in the sense that the words appear in context, i.e., it is possible to examine how words point to real-life referents in the two languages. On the other hand, it is well suited to reveal the effect of cross-cultural differences on bilingual language use (Pavlenko, 2009, p. 131) in interaction. To tap into bilingual language processing with a special focus on conceptual representations, the interviews focused on cultural topics where the probability of cross-cultural and cross-linguistic differences is high: school, food, and holidays.

2.3. Procedure

The interviews were first video recorded, then transcribed in CHAT format using the CLAN open-source transcription tool (*TalkBank*, n.d.).

Next, the data were examined to identify linguistic phenomena indicating interference from the non-target language. The current paper focuses on two specific forms of cross-linguistic influence in bilingual speech: code-switching (CS) and loan translations (LT).

Instances of CS were listed in two separate tables for the two interviews (see Tables 1 and 2 in Section 3). Where possible, translations are provided for each item; in cases where no direct translation is available, brief explanatory notes are added to help comprehension. The next step in the analysis involved examining conceptual equivalence. Each item was categorized as exhibiting full, partial, or non-equivalence. Tables 1 and 2 also contain information on the immediate context of CS material, i.e., the specific utterance in which the CS occurs, as well as the topic under discussion at the time.

The data were further analysed to identify and examine instances of loan translations (LTs). First, an inventory was created in a table format. Due to the limited number of occurrences, all examples were compiled in a single table (see Table 3). Each item is accompanied by a translation and its intended (target) structure. The final column provides contextual information on the proximity between the LT and any nearby CS instances.

Since the study is exploratory and interpretive in nature, the analysis seeks to uncover and describe patterns in language use in order to shed more light on the nature and structure of conceptual representations in the English-Hungarian context.

3. Results

The 47-minute interview in Hungarian contains 485 participant utterances and a total of 2609 words. Within this sample, 27 instances of CS and 11 instances of LTs were identified (see Tables 1 and 3). The 50-minute interview in English contains 351 participant utterances, with 2419 words in total. This interview yielded 31 CS instances and 2 loan translations (see Tables 2 and 3). While the frequency of code switching is relatively comparable across the two interviews, a notably higher number of loan translations was observed in the Hungarian single-language interview compared to the one conducted in English.

3.1. Code switches in the two interviews

A cross-examination of code-switching and the availability of fully equivalent concepts in the non-target language was carried out to reveal any potential variations. The distribution of cases of full equivalence checked against the total number of CS shows a major difference: 37% (10/27) in the interview in Hungarian, and 77% (24/31) in the interview in English. One contributing factor to this difference is the section of the interview in English where the participant switched to Hungarian for a longer stretch in the discussion of canteen food in Hungary (9 instances out of the total of 31). A similar switch did not occur in the interview in Hungarian.

Table 1. CS from Hungarian to English in the Hungarian single-language interview, sorted by level of equivalence

code-switched item	translation	equivalence	context/actual utterance; comments	topic
term	félév/trimeszter/szemeszter	non	*egy term-re adtak*	school
science	természettudományos tantárgy	non	*science-re kellett*	school
term	félév/trimeszter/szemeszter	non	*egy term alatt*	school
term	félév/trimeszter/szemeszter	non	*szóval term közben*	school
Reception	első általános iskolai év	non	*mert Reception óta együtt játszottunk*	school
science	természettudományos tantárgy	non	*de ott öö volt öö **science**, matek (self-correction)*	school
report card	év végi szöveges értékelés	non	*egy év végén kiadták az ilyen report card-ot*	school
term	félév/trimeszter/szemeszter	non	*öö minden term-ben volt egy olyan hogy…*	school
roast dinner	ebéd sült hússal	non	*a roast dinner*	food
gammon	füstölt sonka	non	*a roast dinner az olyan volt hogy gammon szóval az az ilyen szalámi*	food
Guy Fawkes	Guy Fawkes (nap)	non	*Guy Fawkes, igen*	holidays
high-school	középiskola	partial	*meg tudjuk szokni a high school-t*	school
RE	hittan	partial	*meg RE*	school
Religious Education	hittan	partial	*öö Religious Education*	school
literacy	írás/olvasás	partial	*meg literacy (meg = és)*	school
submarine	tengeralattjáró	full	*egy submarine-t kellett csinálni*	

Big Fire of London	nagy londoni tűzvész	full	*aki ott volt a Big Fire of London-ben*	holidays
English grammar	angol nyelvtan	full	*English grammar meg literacy*	school
PE	testnevelés	full	*meg PE*	school
religion	vallás	full	*más izé öö religion-ökből*	culture /school
long jump	távolugrás	full	*meg long jump-ot is csináltam*	sports/school
garlic	fokhagyma	full	*a lasagne az garlic hát öö fokhagymásan*	food
witch	boszorkány	full	*voltam öö vámpír meg voltam öö witch*	holidays
random	véletlenszerű/random	full	*a tanár ... osztotta ki random szerűen*	
sleepover	ottalvás/sleepover	full	*meg amúgy volt voltak sleepoverek*	

Table 2. CS from English to Hungarian in the English single-language interview, sorted by level of equivalence

CS item	translation	equivalence	context/actual utterance; comments	topic
pörkölt tésztával	stew with dumplings	non	*hm ... pörkölt tésztával*	food
meg volt rizses husi	and there was meat risotto	non		food
főzelékek voltak	there were various types of creamed vegetables	non	*fő főzelékek voltak* (tone and accompanying facial expression : I don't like it)	food
diós tészta meg mákos tészta	pasta with walnut and pasta with poppy seed	non	*so er... diós tészta meg mákos tészta... er .. and they ……*	food
a főzelék	the creamed vegetable	non	*I'm not very picky but it's the* ***a főzelék***	food
meg gyümölcsmártás hússal	and sour cherry sauce with meat	non + full	expresses indignation	food
külön a hús meg a gyümölcsmártást	meat (full) and sour cherry sauce (non) separately	full + non	meaning they are acceptable separately	food
néptánc	folk dance	full	*er... Hungarian folk dance... néptánc*	school
nem tudom	I don't know	full	*er to er to er .... nem tudom* (meaning: I can't remember)	holiday
igen	yes	full	*in response to „Did you visit a place in Hungary?"*	holiday
nem tudom	I don't know	full	*er ... nem tudom* (meaning: I can't remember)	
nem Tapolcára	not to Tapolca (town)	full	*in nem Tapolcára*	holiday
valahol máshova	somewhere else	full	false access of pronoun (*valahol*, instead of *valahova*) due to cross-linguistic influence: *somewhere* in both cases	holiday
a Balaton mellett valahol	somewhere near lake Balaton	full		holiday
valahol	somewhere	full	*aha valahol*	holiday
iskola	school	full	*Batsányi iskola*	school
nem tudom	I don't know	full	*er... nem tudom* (affective motivation: reluctance to openly criticize a teacher)	school
de vannak olyanok, akik nem annyira jók	there are some [teachers] who are not that good	full	affective motivation, avoidance of mentioning people by their name	school
szerintem más nem volt, ami ennyire ízlett	I don't think there was anything else that I liked so much	full		food
fasírttal	with meatloaf	full	*(tone and accompanying facial expression : I don't like it)*	food
de egybe!	but in one dish!	full	*indignantly*	food
szegény husit beleteszik a gyümölcsbe	poor meat is dipped in the sauce	full	*(childlike, playful tone)*	food
nem t'om, nem jó	I don't know, it's not good	full		food
ünnepek	holidays	full		holidays
ünnepekről tanultunk	we learned about the holidays	full		holidays/school
meg (Annabelle)	and (Annabelle)	full	*Orsi erm meg Annabelle*	school

megye	county	full	*Csongrád-Csanád megye*	family
nem tudom	I don't know	full	*in response to what makes her feel sad (….) nem tudom*	emotions
hogyha meghalna az anya vagy az apa vagy a Robi*	if daddy or mum or Robi* [brother's name] died	full		fears

*The brother's name was changed to protect privacy.

3.2. Loan translations

A remarkable asymmetry can be observed in the number of loan translations too in the two interviews, but with a reverse out-turn: 11 cases of LT can be found in the interview in Hungarian, and only 2 in the interview in English (see Table 3).

Table 3. Loan translations in the two interviews

#	token	translation	target structure	proximity to CS
interview in Hungarian				
1	*mosogató öö folyadék üvegbe ből*	in a from a washing liquid bottle	mosogatószeres flakonból	1
2	*akik tanították az órákat*	who taught the lessons	akik az órákat tartották	2
3	*a tanár […] osztotta ki öö random szerűen, hogy ki kinek melyik jut*	the teacher distributed them to the students randomly	a tanár osztotta ki véletlenszerűen, hogy kinek melyik jut	0
4	*a tanár tartotta a fiókjában*	the teacher kept them in her drawer	a tanár a fiókjában tartotta	2
5	*egy év végén*	at the end of a term	a félév végén	0
6	*kiadták az ilyen report card-ot*	they issued a (sort of) report card	bizonyítványt/értékelést írtak	0
7	*long jump-ot is csináltam*	I also did the long jump	távolugrásban is indultam	0
8	*de ott volt öö több választék*	there were more options there	ott választani lehetett	2
9	*kettő húsos és egy öö vegetáriánus választék*	two meat dishes and a vegetarian option	két húsétel és egy vegetáriánus étel	2
10	*desszertre néha volt ilyen gyümölcstál*	for dessert sometimes there were fruits	desszertnek néha volt ilyen gyümölcstál	1
11	*az étel miatt, meg a keresés miatt*	because of the food and the [treasure] hunt	az étel miatt, meg a tojáskeresés miatt	n.a.
interview in English				
12	*semi-joint houses*	ikerházak	semi-detached houses	n.a.
13	*the high highest group*	a felsős, legidősebb csoport	the oldest group	2

4. Data analysis and discussion

Conceptual equivalence must always be studied in the context of specific language pairs and specific cultural settings since lexical concepts may vary across cultures using the same language, e.g., in various English-speaking countries. The context of the data below is Hungarian on one hand, and UK English on the other hand.

Following Pavlenko's principles for conceptualizing equivalence, the rule of thumb was to examine whether the code-switched lexical item and the corresponding other language item would point to the same real-life referent. In the case of full equivalence, for instance, the respective words in the two

languages would evoke the same images for monolingual speakers (Pavlenko, 2009). The examples below were retrieved from the interviews.

The relation of full equivalence is a clear-cut case where monolingual speakers of the two languages in question would have the same idea in mind when hearing the respective word. One example of this is the concept of *the long jump* in English and *távolugrás* in Hungarian. Categorization of such word pairs raises no issues.

In the category of non-equivalence, owing to cross-cultural or cross-linguistic differences, no monolingual speaker of the non-corresponding language would have a grasp of the concept even if it is described or explained in their language. This is the case of certain dishes that are particular to one culture but unknown in the other. *Pasta with poppy seed* would evoke no memory or image in the mind of an individual growing up in the UK without some knowledge of Hungarian cuisine. Similarly, *term* would not ring a bell to any Hungarian native speaker unless they are familiar with the school system in the UK or some other country with a similar division of the school year. Therefore, categorization does not seem problematic.

However, the case of partial equivalence is a more complex issue. Taking Pavlenko's definition as a starting point, this is the case when certain elements of the two corresponding lexical concepts overlap, but others do not. The case of *RE* vs. *hittan* can be cited as an illustration. When used as the name of a school subject, i.e., one item in the list of school subjects, the representations can be regarded as equivalent. However, when considering the content of the given subject, as experienced by the participant in the UK school (dealing with religions around the world), and eventually in the Hungarian school (centered around Christianity), it becomes evident that the two concepts diverge. Consequently, the *RE* and *hittan* pair has been classified as a case of partial equivalence. The same principles were applied in assigning items to one of the three categories.

In the following sub-sections, first, the background of code-switching will be discussed in relation to conceptual equivalence. This will be followed by an analysis of loan translations, with particular attention to their immediate discourse context.

4.1. Code-switching

4.1.1 Conceptual non-equivalence

Conceptual non-equivalence is the epitome of asymmetry of representation at the crossroads of cultures. In cases where a lexical concept exists in one language without an equivalent in the other, bilinguals face the challenge of conveying the intended meaning in the incongruent language. One strategy is to explain by pointing out the most relevant features of the concept in question. However, this approach may be arduous, lengthy, and disruptive to the flow of communication. What is more, the result of such explanations may seem a poor approximation and still unsatisfactory in the speaker's mind. In such cases, code-switching may serve

as a more effective and accurate alternative, and if this is the case, it is used in an interpretive function (Pavlenko, 2008, p. 147).

In the interview in Hungarian, most of the code-switched elements relate to the topic of education, with a few pertaining to the domain of food. Due to the differences between the educational systems in the UK and Hungary, certain English concepts, such as *term*, *science* (as a school subject), *Reception*, and *report card,* lack direct conceptual equivalents in Hungarian. As a result, code-switching provides an efficient means for the speaker to convey these ideas. The same applies to food-related code-switched elements, where cultural differences of culinary practices similarly prompt the use of English terms to express concepts that are not easily translatable.

The term s*cience* emerges on two occasions in the interview, both times denoting a school subject. Yet, a closer analysis reveals a conceptual distinction between the two instances. In the first case, it appears in the context of home assignments and is modified by a Hungarian inflection (*science-re;* 'for science'). This instance is no different from the previously listed school-related code-switches, functioning as a means of interpretation. From the context, i.e., various assignments at the UK school, it is obvious that the speaker refers to the school subject, encompassing the comprehensive study of the physical and natural world.

In the second occurrence, *science* is listed alongside other subjects taught at the UK school, and the participant provides clarification through self-correction, adding the intended Hungarian term *matek* ('maths'). This substitution notably narrows the scope of the concept to a specific branch of natural sciences, mathematics. The correspondence here reflects the shift in the structure of the participant's mental lexicon, shaped by her current schooling experience in Hungary, where natural sciences are divided into discrete subjects such as mathematics, physics, and chemistry. The fact that this shift took place within the scope of one interview supports Pavlenko's argument (2009, p. 148) regarding the context-dependent and dynamic nature of bilingual conceptual systems.

The interview in English contains instances of non-equivalence exclusively within the domain of food. Notably, at one point, code-switching takes place at the discourse level: the participant shifts entirely from English to Hungarian for an extended portion of the interview in which canteen meals are discussed, despite the interviewer continuing in English (see Excerpt 1 below). While naming the dishes in the non-target language may reflect an interpretative intent, the complete language shift appears to be motivated by a different factor. Given that the participant is expressing strong preferences – both likes and dislikes – this segment likely carries a significant affective load, which may account for the full switch to the emotionally dominant language. This interpretation is further supported by accompanying speech disfluencies such as pauses, false starts, and non-verbal cues.

Excerpt 1
*INV: anything that was well &*PAR:yeah well prepared and you liked?
*INV: what what was it?
*PAR: &hm (.) *pörkölt tésztával*.
*INV: okay uhum that's yummy.
*PAR: *meg volt rizses husi*.
*INV: aha okay.
*PAR: *szerintem más nem volt, ami ennyire ízlett*
*PAR: *fő főzelékek voltak*
*INV: uhum uhum
*INV: you don't like
*PAR: *fasírttal*
*INV: aha
*INV: do you like those?
*PAR: *meg gyümölcsmártás hússal.*
*INV: don't seem to like it.
*PAR: *külön a húst meg a gyümölcsmártást*
*PAR *de egybe(n)*
*PAR: *szegény husit beleteszik a gyümölcsbe*

In the following section of the interview, after switching back to English, the participant discusses two typical Hungarian dishes. Initially, she offers translations in English, but then feels compelled to name the dishes in Hungarian as well (see Excerpt 2).

Here, code-switching once again fulfils an interpretive function, as evidenced by the positioning of the phrases and lack of syntactic integration. Moreover, the content of the entire paragraph offers a deeper insight into the participant's conceptual framework. The mention of soup and sweet pasta – a common combination in Hungarian school canteens – is framed by the speaker as unusual, indicating a sense of detachment. Considering the participant's linguistic and sociocultural background, this excerpt reflects a distinctive (re)structuring of cultural concepts, highlighting the emergence of a bicultural perspective.

Excerpt 2
*And something strange in the school food as well is that er for the main food er sometimes it would be er pasta with walnuts. So er **diós tészta, meg mákos tészta** er and they wouldn't give any food with it. Well, the soup would be quite meaty but then they wouldn't give any other food. Well, the food would be the sweet walnut and poppy seed er pasta.*

4.1.2 Partial equivalence

In cases of partial equivalence, lexical categories in the two languages do not fully overlap. The nature of this relationship may vary depending on what aspects overlap, what is divergent, or whether one category subsumes one or more categories in the other language, etc. The following section presents an analysis of the code-switched material from a conceptual perspective.

In the interview in Hungarian, four items are standing in a relationship of partial equivalence. *RE* and *Religious Education* appear as two separate instances but represent the same lexical concept, with *RE* serving as the abbreviation for

Religious Education. While *Religious Education* and *hittan* both denote a school subject, they differ in content, making them distinct categories (see the results section for a more detailed analysis). A similar relationship exists between *high school* and *középiskola*, as both refer to secondary education institutions, but differ in age range, specialization options, and types of final examinations.

Closer analysis of the data reveals that in both cases the participant refers to the overlapping representations yet resorts to code-switching. One explanation could be that, since the participant began schooling in the UK, these concepts were first encoded in English, resulting in a higher activation level for the English terms compared to their Hungarian equivalents. This is supported by the appearance of *PE*, despite the existence of a fully equivalent lexical item in Hungarian (*testnevelés*). A second explanation, possibly reinforcing rather than weakening the first, lies in the structure of representations. Their distinct cultural connotations increase the cognitive salience of the English representations, making code-switching more efficient not only ecologically but also conceptually.

The appearance of the term *literacy* in the data raises questions due to the ambiguity of the speaker's intent. It is mentioned alongside *English grammar ('English grammar **meg** literacy')*, in reference to a fifth-grade school subject. This suggests a possible instance of semantic and/or phonological paraphasia where the speaker may have intended to say *English grammar and literature*. The false start before '*English grammar*' supports the semantic interpretation: '*gr'* seems to reflect interference from the Hungarian phrase *Magyar nyelv és irodalom* ('Hungarian grammar and literature'). However, since some uncertainty remains even after the interviewer requests clarification, validity can only be maintained if this item is included in the analysis (see Excerpt 3 for context).

Excerpt 3
*INV: és milyen tantárgyaid voltak?
*INV: mondjuk az utolsó éven.
*INV: emlékszel?
*PAR1: nem voltam hatodikban csak ötödikben de ott öö volt öö science matek.
*PAR1: ööm ööm gr volt *English grammar* meg *literacy*.
*PAR1: vagy ha jól tudom.
*INV: *literature*?
*PAR1: *li lit*, igen az, meg öö szerintem ennyi.

No Hungarian equivalent is available for *literacy* denoting a single school subject, but two constituents, reading comprehension and written production, are part of the Hungarian lower elementary curriculum. Provided the speaker did mean to say 'literacy', this example can be identified as nesting, where the English category subsumes two categories in Hungarian (Pavlenko, 2009, pp. 131–134). In case the speaker meant to say 'literature', it can be regarded as a case of paraphasia facilitated by the activation of the representations in Hungarian.

The interview in English contains one case of code-switching in the category of partial equivalence. After naming an activity in English (*Hungarian folk dance*), the participant feels the need to add the Hungarian equivalent (*néptánc*) as a means of explanation (see Excerpt 4).

Excerpt 4
*INV: and what about dance?
*INV: what kind of dance do you do?
*PAR: er Hungarian folk dance.
*INV: oh.
*PAR: *néptánc*.

A morphological analysis of this example yields an interesting result. *Hungarian folk dance* functions as the object of the verb *do*; therefore, it would be expected that the object suffix be attached to the Hungarian equivalent: '*néptánc**ot***'. However, this is not the case – the Hungarian element does not seem to be morphologically integrated into the structure of the hypothetical full sentence: 'I do Hungarian folk dance*'*. This supports the interpretation that the code-switched element is presented as an additional reference, rather than a syntactic constituent of the main clause.

4.1.3 Full equivalence

Code-switching between fully equivalent lexical categories is generally considered least likely in a single language context. Nevertheless, both interviews contain several such instances. To understand what motivates these code-switches, each case must be interpreted within its specific context. Since the scope of the current paper does not allow a detailed analysis of each occurrence, the discussion will focus on outlining the major motivational factors and illustrating each with selected examples.

4.1.3.1 Language-specific context

Due to the participant's language history, certain topics trigger a heightened activation of one language over the other. Numerous examples of switching from Hungarian to English occur during discussions related to school, which can be attributed to the participant's considerably longer study experience in the English-speaking environment. The words within the school-related topic are either directly linked to the school system, such as school subjects (e.g., *English grammar, PE*), or indirectly associated with content learned in the UK context, including events, facts, or acquired knowledge and skills (e.g., *submarine, Big Fire of London, long jump, garlic*).

Another example is related to holidays (*witch*). Although certain elements of Halloween have been adopted in Hungary, dressing up in costumes remains less common compared to English-speaking cultures. This cultural difference may

account for code-switching when referencing Halloween traditions during the Hungarian interview.

Additional contributing factors can often be uncovered through contextual analysis. In a previous study, I conducted a detailed interdisciplinary analysis of one of the examples of code switching involving full conceptual equivalence. The findings revealed an interplay of individual and situational factors. Beyond a quicker access to the English word *submarine* compared to its Hungarian counterpart, the participant also opted for prioritising fluency over meeting the expectation to keep to the target language. It is important to note that a series of subsequent dysfluencies and cross-linguistic phenomena accompanied this instance of code-switching. These may reflect an increased level of interference as a result of the initial CS.

INV	*És milyen feladatot választottál még ami ilyen, amire úgy emlékszel, hogy tetszett?*										
	And what other projects did you chose which you remember you liked?										
PAR	*Szerintem*	*volt egy*		***o***	*ja igen*	***öööö***	*egy*	***submarine-t***			
	I think	there was a		s[ort of]	oh yes	er	a	submarine.N.infl.obj			
	kellett	*csinálni*	*és*	***öö***	*ilyen*	***öö***	*mosogató*		***öö***	*folyadé**k***	
	had to	make	and	er	sort of	er	washing-up		er	liquid	
	üvegbe	***ből***	*csináltuk*		*és*	*aztán*	*abból*	*vágtunk*	*ki*	*ablakokat.*	
	in bottle	from	made		and	then	from it	we cut	windows		

I think there was a **s**(ort of) oh yes er we had to make er a submarine and in a/from a er washing-up er liquid bottle and we cut windows in it.

An interdisciplinary framework and its application through a detailed analysis of this instance of code-switching are presented in a previous study (Csillingh, 2023, pp. 116–121).

4.1.3.2 Affective factors

Strong emotions or opinions tend to trigger code-switching to L1 Hungarian; however, no examples of switching to English were observed in this category. Code-switching occurs, for instance, when the participant - with a sense of embarrassment - articulates criticism toward a teacher; or when she recalls with excitement an inspiring home assignment (*submarine*). It also appears when she expresses strong preferences or aversions, on one occasion even indignation, associated with certain canteen foods (*meg gyümölcsmártás hússal*), or when she talks about her greatest fear, the hypothetical loss of family members. Utterances marked by strong affection are often reinforced with various verbal and non-verbal cues, such as changes in tone, humour, facial expressions, or gestures, which serve to enhance the expressive power of the statements.

4.1.3.3 Phonetic activation

There are two notable instances where the mention of a name in the non-target language entails code-switching, likely due to phonetic activation. Both examples occur in the interview in English. While talking about school friends, the participant says *Orsi meg Annabel*, where *meg* (an informal Hungarian equivalent of 'and') is triggered by the Hungarian name *Orsi* (a diminutive form of Orsolya). In the second example, recalling a place name, the mention of a Hungarian county (*Csongrád-Csanád megye)* similarly induces a switch (*megye*). In both cases, the phonological properties of the names appear to activate the non-target language.

As demonstrated in the previous sections, code-switching is never the result of an arbitrary language choice, and this holds particularly true in single-language contexts. A thorough examination of the interplay between conceptual representations and contextual factors is essential for understanding the underlying motivations that regulate each instance of code-switching.

4.2. Loan translations

Although neither the single language setting of the interviews nor the participant's experience as a proficient single language user would predict the occurrence of loan translations (LT), the data nonetheless contain a small number of such instances in both interviews.

Table 3 presents the complete inventory of loan translations identified across the two interviews. A translation and its target structure accompany each item. Where applicable, the last column indicates the proximity between code-switching and loan translations. This cross-referencing permits the identification of sections where code-switching and loan translations co-occur, enabling a mapping of potentially related linguistic phenomena.

Loan translation data were analysed in relation to code switching occurrences according to relative position (before/after), proximity (closeness of LT and CS), and type (LT and type of CS). As for relative position, six of the loan translations occur before, and four of the items occur after code-switching, suggesting no noticeable differences. Table 4 demonstrates the distribution of loan translation instances according to their proximity to CS occurrences. As for proximity, code **0** indicates that the LT and CS appear in the same utterance; **1** denotes that the LT occurs in an utterance directly adjacent to one containing a CS, **2** indicates that the LT occurs a few utterances away but still within the same topical segment. Finally, the code **n.a.** (not applicable) refers to LTs that occur in isolation, with no CS present in the immediate linguistic environment (see Table 4)

Table 4. Distribution of LT instances according to proximity to any CS

Proximity code	number of instances	LT #
0	4	# 3,5,6,7
1	2	# 1,10
2	3	# 2,4,8,9,13
n.a.	2	# 11, 12

Although the results do not indicate a consistent pattern, it is noteworthy that most loan translations (11 out of 13) occur in close proximity to CS material, suggesting a conceivable link between the two phenomena.

A cross-examination of code-switching types based on equivalence relations does not reveal a clear pattern. Loan translations appear in the proximity of CS formed on a relation of 3 instances of full, 2 instances of partial, and 5 instances of non-equivalence. While the frequency of loan translations near non-equivalent code-switches is slightly higher, the data do not provide conclusive evidence of a systematic variation in language use.

However, the linguistic analysis reveals a notable pattern. Loan translations occur at the lexical, morphological, and syntactic levels. The vast majority of loan translations (11 out of 13) are of a lexical nature, where word choice aligns with the expectation to keep to the target language (no switching occurs), yet the surface structure reflects influence from the corresponding concept in the non-target language. For example, *semi-joint house* reflects interference from the Hungarian *ikerház* (‘twin house’), modifying the English *semi-detached house* based on the Hungarian concept of being attached as in “twin” (*iker*). In addition to lexical loans, two instances of morphology-based LT were observed, both influenced by inflectional patterns from the non-target language (e.g., *desszertre;* ‘for desert’; and *üvegbe -ből*; ‘in a, from a … bottle’ - self-correction of the participant). Syntactic interference can be found on two occasions. One involves erroneous article selection (*egy év végén*, ‘at the end of a term’), the other reflects non-target language word order (e.g., *a tanár tartotta a fiókjában*; ‘the teacher kept it in the drawer’).

Besides categorising and examining LT in relation to CS elements, it may also be worthwhile examining LT instances in their context. Excerpt 5 contains a series of attempts through which access to the target phrase “semi-detached house” is eventually achieved.

Excerpt 5
*PAR: those houses were bigger.
*INV: uhum.
*PAR: and there were different types.
*PAR: &-er there were **semi semi joint houses**.
*PAR: there were **c** there were **completely like joint houses**.
*PAR: and there were **detached houses**.
*INV: uhum okay.

*INV: and which type did you use to live in?
*PAR: er **semi-detached** house.

The various stages of the process are not only marked by various lexical solutions and related items (“semi joint houses”, “completely joint houses” “detached houses”, “semi-detached house”, but also by a series of dysfluency phenomena, such as repetition (“semi semi joint houses”), a false start (“c”, “completely”), and fillers (“like”, “er”). These data reveal the fluid, dynamic nature of conceptual representations in bilingual speech, consistent with Pavlenko’s findings on the effect of language-specific lexical concepts on fluency (1997, 2003) as well as research on bilingual performance, which supports the view of conceptual representation as a dynamic, emergent, and context-dependent phenomenon. (Barsalou, 2003; Malt et al., 2003; Pavlenko, 2009).

The data in Table 3 also reveal a definite asymmetry in the frequency of LT across the speakers’ languages. The frequency is significantly higher in the interview in Hungarian than in English. Although the speaker can be considered a relatively balanced bilingual, Hungarian remains her dominant language due to the early onset of acquisition and family language policy. The findings may reflect a higher level of vigilance when speaking English.

5. Conclusions

Bilingual language processing involves alternative ways of conceptualising events and conveying those concepts to an interlocutor. The current paper investigated the conducive factors of code-switching across three categories of conceptual equivalence and examined the mental processes that result in loan translations and code-switching in bilingual speech.

The analysis revealed a positive correlation between the level of conceptual equivalence and the significance of the contextual factors in regulating code-switching. The higher the degree of equivalence, the more influential contextual factors become. In the cases of non-equivalence, switching is more predictable owing to the absence of a corresponding representation in the target language. Partial equivalence tends to reflect more diverse motivations for language choice. However, code-switching in instances of full equivalence can only be fully understood by considering a broad range of factors, including language history, the language of initial encoding, and affective influences.

Loan translations may occur even in the speech of highly proficient bilinguals, reflecting implicit cross-linguistic influences that may manifest at both semantic and structural levels. These instances often arise from complications in lexical access, offering insights into the functioning of bilingual declarative memory. The majority of loan translations appear in close proximity to code-switched material, suggesting a connection between the two phenomena.

Limitations

It is important to acknowledge that while cultural differences frequently play a significant role in both explicit and implicit manifestations of cross-linguistic influence, individual differences must always be carefully considered in order to gain a comprehensive understanding of bilingual language phenomena. Factors such as language dominance, age of acquisition, language exposure, and personal language experience can vary widely across bilinguals, influencing individual performance.

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