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Explaining Code-Switching. Matrix Language Models vs. Bilingual Construction Grammar

Abstract: This paper challenges the concept of matrix, base or basic language used in many descriptions and models of insertional code-switching. It proposes an account based on Construction Grammar and usage-based principles.

At the heart of the paper is a discussion of four problematic issues of matrix-language approaches: the unitary conception of the notion of language, the generalization that syntactic frames mirror languages, the missing independent evidence for a matrix language and the narrow scope of the models that employ this term. The proposed approach of Bilingual Construction Grammar instead operates with a more complex, usage-based concept of language affiliation and places constructions in the centre of speech production. It thus avoids too coarse global predictions in favour of construction-specific predictions. This way, the matrix-language effect can be reinterpreted as by-product of constructional processing. Instead of using the term matrix language it is thus more appropriate to speak of matrix constructions.

Keywords: Construction Grammar, code-switching, bilingualism, matrix language

Introduction

The term "matrix language" and the idea of asymmetric switching is one of the most influential concepts in bilingualism research. The very idea of a matrix language has a long history and many supporters. The observation that even in highly mixed sentences the structure can be analysed as belonging to only one of the codes can be tracked back to at least Hermann Paul. Klavans (1985) and Joshi (1982) introduced the term "matrix" into modern bilingualism research. Myers-Scotton (1997) further promoted the term "matrix language" in her influential Matrix Language Frame Model.

There is a good amount of empirical evidence in favour of the idea that code-switching is often asymmetric. However, no model or approach that uses this concept has been unequivocally accepted by the research community, nor have the various descriptions and definitions of the matrix language. While matrix language models are usually data driven, theory-driven models do usually not assume a matrix language. They rather try to avoid specific bilingual assumptions, because this makes the model less relevant for general linguistic aspects. Also, the assumption is that bilingual language processing models must not in principle differ from monolingual ones (MacSwan 2005: 277; Muysken 2000: 3). However, these models weren't able to account for all bilingual data, either. Poplack summarizes that "[t]he assumption that bilingual syntax can be explained by general principles of monolingual grammar has not been substantiated" (Poplack 2004: 590).

In this paper I would like to discuss some basic problems that are common to all approaches that in one way or another are based on the concept of a matrix language. Some of these problems have already been highlighted in the literature (Clyne 1987; Gardner-Chloros and Edwards 2004; Heller and Pfaff 1996; Poplack 2004: 592). First, the notion of language is notoriously difficult to define and as such no good starting point for a model. Furthermore, the conclusion that asymmetric code-switching shows the role of whole languages – and not of single constructions – for language production is questionable.

Next, there is no independent evidence for a matrix-language from non-bilingual settings. Fourth, the scope of matrix language models is generally limited to some special types of code-switching. I want instead to present an approach that combines the advantages of a theory-based analysis of language contact with the empirical strength of matrix language models, but without adopting their conceptual weaknesses. The approach is called Bilingual Construction Grammar (BiCxG) and uses the theoretical foundations of Construction Grammar.

In the remainder of the paper I will first explain some basics of the matrix language models, while others will be described in more detail in the following subchapters. In section 3, I will outline the basic principles of Bilingual Construction Grammar with a focus on codeswitching. In the following sections 4 to 7, I discuss the mentioned issues of the concept of matrix language one by one and show how a Construction Grammar approach avoids them without losing explanatory power.

I am partially using data from a corpus of Serbian-Hungarian bilinguals in this article (Wasserscheidt 2016a). The corpus contains spontaneous and semi-structured every-day conversations from members of the Serbian minority in Hungary.

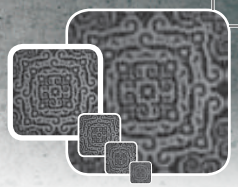
Matrix Language Approaches

The term "matrix language" and the idea of asymmetric switching is one of the most influential concepts in bilingualism research. The observation that even in highly mixed sentences the structure can be analysed as belonging to only one of the codes can be tracked back to at least Hermann Paul. He states that "innerhalb eines Satzgefüges wird doch immer die eine [Sprache] die eigentliche Grundlage bilden, die andere wird, wenn sie auch mehr oder weniger modifizierend einwirkt, nur eine sekundäre Rolle spielen" (Within a sentential frame, one language will always constitute the true basis; the other language, even if it has a more or less modifying influence, will play only a secondary role. Paul 1995/1880: 392, my translation). Klavans

(1985) and Joshi (1982) introduced the term "matrix" into modern bilingualism research. Myers-Scotton (1997) further promoted the term "matrix language" and defined it as the core of classical code-switching. The term "base language" has been used by Nortier (1990) and Moyer (1998) inter alia. Johanson (1998) uses the terminology "base code" or "basic code" for a similar purpose.

Even though the strict determinative nature of some matrix language based models seems not to be applicable to all contact situations (Muysken 2000: 68), many linguists agree that code-switching is often asymmetric insofar as only one language determines the underlying syntactic structure (Backus 2010: 229; Chan 2010: 187). Many studies on code-switching take the notion of matrix language for granted and analyse their data against this background (Bolonyai 2005; Halmari 1997; Hlavac 2003; Kyuchukov 2006; Muysken 2013; Zabrodskaja 2009). In the following, I will use the term matrix language because it is the most widespread, but this terminology is also intended to cover the notions of "basic code" and "base language".

The role of the matrix language in all matrix language approaches is that it provides the frame or template of a given sentence (Johanson 1999: 42; Myers-Scotton 2007: 253). Usually, it is assumed that all or most of the grammatical morphemes as well as word order are determined by the grammatical rules of the matrix language (Johanson 1999: 42; Myers-Scotton 1997: 83). Johanson states "that copies from elements from foreign codes are inserted into a native 'basic code' which provides the morpho-syntactic frame for the insertion" (Johanson 1998: 327). All syntactic elements that bear no or only limited grammatical function can be provided by another language, which is called the embedded language (by Myers-Scotton) or model code (by Johanson), although there are some theoretical differences between these notions. The most spelled out model which employs this term is the Matrix Language Frame (MLF) model developed by Myers-Scotton (2002, 1998, 1997) and Myers-Scotton and Jake (Jake – Myers-Scotton 2009; Myers-Scotton – Jake 1995, 2013). The MLF model explicitly defines the roles of the two languages using a series of principles and hypotheses. In a nutshell, morphemes that take



part in the set-up of the given linguistic structure and are controlled by a head outside their immediate structure ("maximal projection") and are supposed to be selected early during speech production – so-called "early system morphemes" – must come from the matrix language, while morphemes less involved in the overall syntactic structure can come from the embedded language.

Several proposals have been made in order to explain the linguistic and psycholinguistic motivation behind the asymmetry. Halmari argues that the matrix language effect is due to obligatory properties that every sentence, once started, has to incorporate. Because these properties differ between languages, speakers tend to produce fluent switches only with elements that do not bear the properties of the sentence (Halmari 1997: 75). Myers-Scotton offers a similar explanation which she subsumes under the Uniform Structure Principle. It says that every constituent or construction has a uniform structure that the speaker has to produce. This structure comes preferably from the matrix language (Myers-Scotton – Jake 2013: 513).

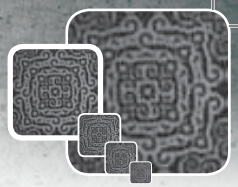
Bilingual Construction Grammar

Bilingual Construction Grammar (BiCxG) is motivated by *Construction Grammar* and based on evidence from language contact, psycholinguistics, and grammatical theory (for more details see Wasserscheidt 2016a; 2016b).

The principles of Construction Grammar are based on the observation that speakers use to rely on resources that are not being built up from scratch for every speech act but exist as stored units in the speaker's mind. Langacker (1991: 15) defined such units as "thoroughly mastered structure, i.e. one that a speaker can activate as a preassembled whole without attending to the specifics of its internal composition". In Construction Grammar, these chunks are defined not only structurally, but also semantically and pragmatically. A construction is the conventionalized complex combination of linguistic form with meaning and its conditions of use. These combinations have to be learned and are re-learned every time the speaker hears or produces them (Boas 2010: 3; Goldberg 2013: 15–16).

While most grammatical theories assume the existence of such constructions (Schönefeld 2006), Construction Grammar does not limit this term to idiosyncratic cases. Rather, the tenets of Construction Grammar are that language is built up entirely of constructions (Stefanowitsch 2011b: 20), constituting a continuum between grammatical and lexical units. This continuum of constructions implies that construction grammarians do not accept a strict division between lexicon and syntax (Goldberg 1995: 7). Construction grammar thus incorporates linguistic elements from all levels of description into one model (Fried 2015: 4; Goldberg 1995: 7), including morphemes, more or less fully filled idioms, collocations, verb class-specific argument structures, partially filled words, argument structures, and even text types. Constructions vary mainly in their degree of complexity (number of elements and signs incorporated) and schematicity (proportion of underspecified "slots"). As such, the term construction is able to cover all those linguistic units that in contact linguistics where often subsumed under the label "element", for example when Muysken formulated his research question as "how can a bilingual speaker combine elements from two languages when processing mixed sentences?" (Muysken 2000: 1) or Treffers-Daller used the term element "for want of something better, as there is no other term to cover the wide variety of phonological, morphological, syntactic, semantic, and conceptual features, lexical items, phrases, clauses, multiword chunks, and graphemic symbols that can be transferred from one language to another" (Treffers-Daller 2010: 59).

Bilingual Construction Grammar is also based on the assumption that language consists entirely (or mostly) of constructions. Importantly, constructions combine surface information (phonemes, stress, order, etc., not linguistic metadescriptions) with semantic information. The form-meaning pairing is usually complex, because a construction can integrate other schematic and non-schematic signs. Therefore most constructions consists of a) components (signs) with their respective form, meaning and the symbolic connection between them, b) the meaning of the construction (semantic pole), c) possible elements on the which have no inde-



pendent meaning on their own (phonological pole) as well as d) the symbolic link between the constructional meaning on the one side and the components and elements on the other.

Bilingual Construction Grammar is furthermore an explicitly usage-based model which treats language acquisition and language use as a bottom-up process. What is important for the analysis of bilingual language data is that usage-based approaches are rather economical in their use of abstractions. This is an important difference to individual approaches like Höder's Diasystematic Construction Grammar (Höder 2018), in which the assumption of the cross-linguistic existence of abstract constructions plays an important role. The most important abstraction in general is that of *language* itself.

BiCxG assumes that the glue that holds constructional (or more generally, linguistic) networks together cannot be captured by simply referring to a language (as a metalinguistic unit), but proposes a more complex model of language membership that does not assume explicit marking of (meta)linguistic information including language affiliation. Language as a mental unit is understood as part of a heterogeneous network of formally overlapping and frequently co-activated units with similar contextual/pragmatic information. However, since in a usage-based approach, constructions are learned bottom-up – based on concrete forms in concrete situations – most constructions are essentially language-specific (Wasserscheidt 2016b).

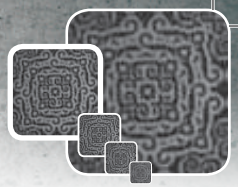
BiCxG furthermore prefers a *frame/construction-centred approach* to speech production. Whether language production is lexically driven or frame-based is an old discussion (compare Paul 1995/1880: 121). The same discussion is going on in the field of grammatical theory (Müller – Wechsler 2014) and in psycholinguistics (Bock – Ferreira 2014). The process of formulation during speech production in BiCxG is depicted as activation, selection, and combination of constructions with varying degrees of complexity and schematicity. The assembly of syntactic structures can be initiated by both lexical items (lexicalist approaches Bock – Levelt 1994; Friederici 1995; Levelt 1989) and constructions (frame-based approaches Bock – Ferreira 2014;

Wardlow Lane – Ferreira 2010), depending on previous activation through context and the availability of the units in the lexicon (or constructicon).

The basic process or strategy in BiCxG is thus the selection and combination of complete, pragmatically adequate linguistic signs of various complexity. According to the plug-in-like nature of Construction Grammar, this process is often basically the insertion of (smaller) constructions into other (bigger) constructions. Insertion can be restricted through constraints on the level of the single construction. Constraints can refer to pragmatic, semantic, or phonological information (Steels et al. 2012: 208), but not metalinguistic descriptions. Importantly, there is no constraint that refers to language. Following the tradition in contact linguistics, I call this process, which indeed is simple speech production, *insertion*, and assume that bilingual insertion should be possible at the same places where monolingual linguistic units are combined. In contrast to Muysken, who assumes a constraint such as "don't switch between separate languages" (Muysken 2013: 715), BiCxG holds that codeswitching is in principle always possible as long as the constraints of the involved constructions are not violated (Fried 2015: 21).

Since bilinguals obviously do not only use well-formed constructions, but often rearrange the symbolic links between the formal/phonological pole and the semantic pole, BiCxG further assumes that there are other strategies for using units of form and meaning in addition to the "normal" insertional production of constructions. Their outcome is not codeswitching, but bilingual phenomena in a wider sense. The basic assumption here is that genuine symbols only occur in conventionalized units. All other ways of use are therefore only *references to parts of symbols (constructions)*, which do not create new symbols. These strategies have been explained in detail in Wasserscheidt (2016a), the following list is only a short overview.

- Translation: Reference to the meaning of a construction (without considering the form)



- Analogy: Reference to the symbolic link between the constructional meaning and the constructional form. This strategy uses similarities between (often polysemous) constructions in the other language, e.g. the use of the noun *nedjelja* by a Serbian speaker in a Croatian linguistic environment when referring to the meaning 'week', based on Serbian *nedjelja* 'week/Sunday' (polysemy) vs. Croatian *nedjelja* 'Sunday' (no polysemy)
- Imitation: Reference to the symbolic link between the constructional meaning and the meaning of the components, e.g. the Russian *my s toboj* 'you and me' (= 2 persons) as source of an *ad hoc* Bosnian calque *mi sa tobom* with the intended reading 'you and me' instead of the normal Bosnian reading 'we with you' (= more than 2 persons)
- Mimicry: Reference only to the form of a construction, e.g. German *Handy* 'mobile phone' vs. English *handy* 'handy'; here only the form is referred to without taking over the meaning)

These strategies cover practically every type of bilingual language use. In fact, codeswitching or translanguaging usually involves several strategies within one utterance.

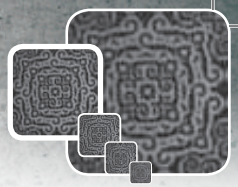
Bilingual Construction Grammar and matrix language approaches share the same principal assumption that speech production prefers the production of whole linguistic units in one piece. They also correspond in the assumption that larger structures offer slots for insertion. The difference is that matrix language models require the selection of a language first. I think that this (together with the relevant but rarely discussed difference between lexical and structural approaches) is the crucial shortcoming that causes the disadvantages of these models discussed in the literature cited above. I will discuss them individually below, starting with the most general problem.

The Conception of Language

Many of the criticisms of the notion of base or matrix language are focused on the notion of "language" itself and the domain of the determination of a language (Auer 2007: 14; Gardner-Chloros – Edwards

2004: 119; MacSwan 2005: 5; Sankoff – Poplack 1981: 11). Although some authors are very careful not to refer to a specific monolingual reference language as the matrix language (Myers-Scotton 2000: 120), the very assumption of a matrix language rests on the possibility to describe the linguistic means a bilingual utilizes as two more or less neatly separable self-contained systems (Auer 2007: 18). This is rather difficult to bring together with dialects and other substandard variations (Heller – Pfaff 1996: 601) and the fact that speakers master and use different genres, registers, and text types during mixing (Albirini – Chakrani 2016). Moreover, it does not take into account that code-switchers, especially in minority languages, may not possess properly separated linguistic systems, but rather blended concepts and constructions (Kecskes 2006). Bilinguals also sometimes develop new linguistic resources that do not exist in either of the languages involved. Cases in point are mixed compound verbs, portmanteau constructions, double marking of grammatical functions (Chan 2010: 187), or diasystematic constructions (Höder 2018). In several contact situations, the languages are also known to converge, so that it becomes unclear whether a structure is still from language A or already from language B (Besters-Dilger et al. 2014; Clyne 2003: 141; Pfaff 1991).

Taking into account language varieties, genres, synergic concepts, bilingual constructions, and convergence makes it often difficult to unequivocally identify a concrete language as matrix language and hence to predict the structural constraints the matrix language ought to set. However, as Auer points out, the proper definition of a matrix language is a prerequisite for matrix language models (Auer 2007: 18). Bilingual speech to the contrary indicates that languages cannot be the basis of linguistic analysis (Auer 2007: 2). This echoes the claim made by MacSwan that the notion of a language should not be the starting point for accounting for bilingual data (MacSwan 2005a: 5). To put it differently: languages as mental entities are most probably not monolithic structures, but fluid categories that do not lend themselves to the simple differentiation between matrix and embedded language. Rather, we need a more realistic and thus more complex concept of language and the requirements for the language affiliation of a linguistic unit.



Scholars in the generative framework also frequently employ the term language, although not in the meaning of a matrix language. Muysken, for example, proposes an account to insertional mixing that uses language indices or features (Muysken 2000: 95). In order for this to work, it must be clear what counts as language and what does not. In a later account within Optimality Theory, Muysken proposes a general constraint that says "Don't switch between separate languages, either in their lexicon or in their grammar" (Muysken 2013: 715). Here, too, it is uncertain what qualifies as a language. MacSwan circumvents the notion of language and uses grammar or lexicon instead (MacSwan 2001: 45). However, his hypothesis that "[n]othing constrains codeswitching apart from the requirements of the mixed grammars" (MacSwan 2001: 43) explicitly refers to (lexically encoded) grammars of monolingual languages (MacSwan 2001: 43).

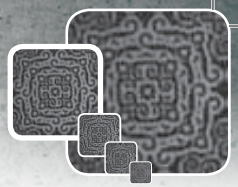
In Construction Grammar, it is constructions that form the centre of linguistic processing. Together with the elimination of the strict separation of grammar and lexicon, Construction Grammar also has the potential to eliminate the unitary understanding of grammar and language. In a usage-based approach (Bybee 2012; Langacker 2000) like BiCxG, linguistic structure is always only the generalisation over occurring sequences. These, however, differ depending on text type, interlocutor, social constellation, place, etc. Speakers learn to consider these differences in parallel with learning the single constructions. In line with Bakhtin's conception of heteroglossia (Bakhtin 1981), a language or grammar can be understood as a network of different constructions on various linguistic levels ranging from single words to whole texts or genres that share certain features (e.g., phonetic similarity, pragmatic scope, etc.). Each community of praxis has its own subnetworks (geographic, age-related, subject-specific, etc.) and every speaker is part of several subnetworks. So, every speaker has networks of linguistic ("texts") and sociolinguistic routines ("lects"). Language or grammar in the unitary sense, again, is depictable as generalization over a specific amount of subnetworks which share properties on the formal pole and in their broader sociolinguistic

restriction (for more details, see Wasserscheidt 2019). Language as a unitary system is thus an epiphenomenon of cognitive processes. However, it is something that is posited, not something given (Bakhtin 1981: 270).

It is important to bear in mind that the constructions known by a speaker not necessarily form a language. While the phrase *Guten Tag* in the utterance of a Serbian-Hungarian bilingual in (1) is clearly a German phrase embedded in an Hungarian context, it would not be correct to say that the speaker here has activated German as a *language*. In fact, the speaker knows only a few fixed German expressions, some of which are represented in my corpus. He cannot, however, produce new utterances as he has no productive knowledge of German. It would hence not make sense here to call German an embedded *language*. Rather, it seems more plausible to analyse the phrase *Guten Tag* as an embedded (idiomatized) *construction*.

(1) a hentes- től, a kínai étterem mindenki "Dimitri, *Guten Tag*!",
DET butcher- ALL the chinese restaurant everybody Dimitri good day
elöl -e elment a kalap.
ahead -3SG gone the hat
'… from the butcher (to) the Chinese restaurant everybody was like: "Dimitri, how do you do!", and hats were pulled off before him.' (Hungarin regular, *German* italic; Author's corpus)

In general, the role of languages is often to some extent overestimated in bilingualism research. Speech production as well as code-switching is not necessarily the production of languages. As Kecskes points out: "In the case of bi- and multilinguals it is crucial to emphasise that in the production process they select not languages, as several studies [...] claimed, but words [...]. So, it is not languages that compete for selection, but words" (Kecskes 2009: 7). In a constructionist approach, it is not only words, but constructions that are produced and need to be selected. Speech production in monolinguals as well as bilinguals does not *need* to include information about language at all, let alone knowledge about which language



should be used as matrix language. In addition, bilingual data show that speakers are often not sure about the language affiliation of lexemes: In (2) the speaker thinks that *salama* is not a (Standard) Serbian word, but rather a word borrowed from Hungarian, which is being used only by Serbians in Hungary. It is, however, a normal Standard Serbian lexeme.

(2) Salama kaže -mo mi tu•• jel *magyár* -i kaž -u *szalámi*
salami say -1PL we here because Hungarian -PL say -3PL salami
'We say here 'salama' … because the Hungarians say 'szalámi". (Serbian – *Hungarian*, Author's corpus)

In a constructionist approach which concentrates on the production of constructions and not on imaginary individual languages, a missing or unclear language membership does not pose any problem. Bilingual, unaffiliated or incorrectly affiliated constructions can be integrated just as any other construction, particularly if they are frequently used and thus conventionalized within a bilingual community.

Generalizing from Frame to Language

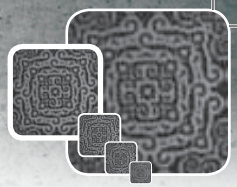
While the idea of a matrix language originally seems to be inspired by the impression that speakers can (always) determine the language of a sentence (see section 6), later works do not rely on a speaker's assessment of mixed utterances. Rather, it has been observed for a long time that in code-switched utterances, often so-called grammatical morphemes come from one language, while elements that belong to another linguistic system often appear to be lexical items (Auer 2007: 13; Myers-Scotton 2007: 212). There is a lot of evidence in the literature for this asymmetry, at least in some types of code-switching (Schmitt 2000).

A plausible generalisation from these findings is that the frame of mixed utterances is usually provided by one language and elements from the other language can only be inserted into this frame. However, matrix language approaches do not stop here. Instead of saying,

that language-specific frames determine the places where insertions can occur, they equal these frames with *languages*. Myers-Scotton seems to assume that languages simply *are* a frame when writing "one variety is structurally dominant in the sense that its grammatical frame prevails" (Myers-Scotton 2000: 120). Matrix language models thus do not make predictions on the level of frames, which would be reasonable, but on a global language level, usually by dividing between grammatical morphemes coming from the ML and content morphemes that can be inserted. Empirically, this leads to serious problems in identifying the matrix language from given utterances, as witnessed by the many unsatisfactory measures proposed (see discussion in Clyne 1987; Muysken 2000: 64; Sankoff – Poplack 1981: 11). And of course, it automatically rules out all utterances, where globally no language prevails, namely alternations. The MLF model tries to salvage this conceptual problem by assuming "embedded language islands" (Myers-Scotton – Jake 1995: 25), "composite codeswitching" (Myers-Scotton 2007: 242), or "matrix language turnovers" (Myers-Scotton 2002). However, the generalisation from a frame to a language is not in general promoted by any linguistic data.

Matrix language models hence depend on the assumption that speakers select languages for production, which in turn provides frames. However, if this were true, language production would have to be selective, so that only frames from the selected language are activated and produced. Selectivity is indeed a major topic in psycholinguistic research. Most evidence, however, speaks for non-selectivity (Abutalebi – Green 2007: 244; Altarriba – Basnight-Brown 2009: 21; Bot 2004: 199–200; Kroll – Tokowicz 2005: 541; Paradis 2004: 205).

If we assume in line with BiCxG that language production is only about the production of linguistic units, including constructions, no improper generalization from frames to languages has to be made. However, since constructions are usually language-specific, their phonological elements naturally come from only one of the languages involved in the language contact. The code-switching literature is full of examples in which one or more schematic constructions have been demonstrably completely produced and thus provides phonological



form exclusively from language A or language B (Hlavac 2003). Given that the form of a construction depends on its degree of schematicity, the amount of phonological elements affected by this may be very small. Thus, a Serbian or Hungarian ditransitive construction only specifies the case markers of the patient (or theme) and the benefactive (or recipient), which on average sums up to no more than two phonemes in Serbian and 4.5 phonemes in Hungarian.

Similarly, examples (3) and (4) show transitive constructions from Ukrainian and Kazakh. In both languages, the form of the construction (marked bold) is highly schematic. It specifies only the accusative marker, which is *-u* for feminine nouns in Ukrainian and *-dï* in Kazakh. Note that the verb slot remains unspecified regarding phonological form. In example (3), the speaker integrated the English word *soda* into the construction, treating it like any other noun from feminine declension class A. The word *soda* is hence integrated following the rules of the construction, where the patient slot is semantically almost unconstrained, but requires the integration into one of the declension classes. The same holds for example (4), where the Russian *zarplata* 'salary' has been integrated into the transitive construction.

(3) Vin tam prodava -v *sod* -**u** […]
He there was.selling -MASC soda -ACC
'He was selling soda there [...]'
Ukrainian-*English* (Budzhak-Jones 1998)

(4) Käzir *zarplata* -mïz -**dï** qos -ïp at -ïr [...].
Now Salary -POS1PP1 -ACC put -CONV AUX -3P
'Now they raised our salary [...].'
Kazakh-*Russian* (Muhamedowa 2006)

Thus, it may be feasible to assume in accordance with the evidence in the literature that mixed sentences indeed often have a coherent matrix or a frame. However, just as I argued that it is not plausible to extrapolate whole languages from single insertions, it is equally not necessary to equate this frame with a language. Rather, we can re-interpret these frames as matrix *constructions*.

More importantly, a constructionist approach allows the verb in argument structure constructions (or more generally the head of any structure) itself to be replaced, because the structure of the sentence is not projected from a verb but motivated independently by the argument structure construction. In my Serbian-Hungarian corpus, there are many examples like (5) and (6), where a Hungarian verb has been inserted into a Serbian frame. Note that in (5), the construction includes an impersonal/reflexive construction (Serbian *pisati se* 'being written'), which has no direct counterpart in Hungarian. In Serbian, the sequence would be *se ne piše*, thus a combination of the reflexive marker *se*, the negation particle *ne* and the third person singular (neuter) form *piše* 'writes'. The Hungarian insertion *ír* 'writes' is also third person singular, the translation equivalent, however, would be a non-impersonal structure (*ott nem ír(ja)* 'there not writes(DET)')

(5) A tamo se ne ír, tamo prvo id -eš i onda se skren -eš.
but there REFL not write.3SG there first go -2SG and then REFL turn -2SG
'But it's not written there, there you first have to go straight and then turn'

(6) Mora biti da odavno oni to već ***lerendez -t -ék.***
must be.INF that long.since they.NOM that.ACC already organise -PF -3PL.DET
'They must have organised this already long ago.' (Author's corpus)

In example (6) we see a sentence formulated entirely in Serbian, in which only the verb is in Hungarian. The transitive verb agrees with the subject and also marks the determination necessary for the known object (*to* 'that').

Arguably, an explanation that usually refers to a matrix language can be reached by simply referring to constructions and claiming their full production in either of the languages involved. Obviously, the constructions involved in examples (3) to (6) are highly schematic. In fact, the behaviour of schematic constructions very much resembles the characterization of the matrix language, defined as: "a frame that contains specifications about slots and how they are to be filled" (Myers-Scotton 2002: 68).

Independent Evidence

The idea of code-switching having a matrix language can be traced back to Joshi (1982), who claimed that mixing is asymmetric. He based his assumption on the statement that "[d]espite extensive intra-sentential switching, speakers and hearers usually agree on which language the mixed sentence is 'coming from'" (Joshi 1982: 145–146). This citation can be found in Myers-Scotton (1997: 35), and it seems to be one of the springboards for her model, which is grounded on this asymmetry. The judgement of speakers regarding the matrix language is also one of her first (but later rejected) criteria for defining the matrix language (Myers-Scotton 1998: 237). Although Joshi does not specify the source of his insight, we can find a surprisingly similar formulation in Sridhar & Sridhar (1980: 409), who Joshi cites in his paper. They use the terms host language and guest language for the very same concept and cite a dissertation from Wentz (1977), which allegedly shows this evidence.

In his dissertation, however, Wentz did not study all kinds of code-switching, but only the insertional type which he called code mixing. He did not study alternations, which he called code changing. Strikingly, he distinguished both types on the grounds of decidability, because code changing "differs fundamentally from code mixing in that sentences which have internal code changes are perceived by informants to be neither Spanish nor English, but both" (Wentz 1977: 142). That is to say, he initially excluded all instances of code switching that could pose problems for the hypothesis that speakers can identify a matrix language. Furthermore, his informants could not freely choose the option for a sentence to belong to two languages: "Now, it must be understood that even the children tested wanted to say that these sentences were all Spanish and English, but they were asked to decide whether each one was 'mostly one or the other'" (Wentz 1977: 228).[1] Crucially, the results indicate that similar sentences sometimes yielded opposite judgements (see original

[1] Note that this holds for examples of code mixing (insertion), not of code changing (alternation)!

judgements for examples (7) and (8)). All in all, Wentz' study comes with a theoretical and methodological bias and nevertheless does not report predictable judgements for a matrix language.

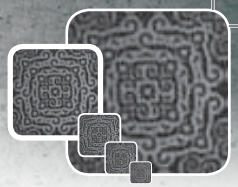
(7) Mira, my mother *quiere cocinar* these vegetables for supper.
wants cook
'Mira, my mother wants to cook these vegetable for supper.'
75% Spanish

(8) My friend John *se caso con* my cousin's boss.
REFL married with
'My friend John married by cousin's boss.'
73% English

Thus, the matrix language Sridhar & Sridhar (1980) and Joshi (1982) built their models on is not very well grounded. One later attempt to justify the notion of matrix language suffers from the same methodological drawbacks, namely that speakers were always forced to decide for one language and the result of this forced decision was interpreted as the easiness to define the matrix language (Kamwangamalu – Cher-Leng 1991). I am not aware of any later study. Both studies do not investigate *if* speakers can determine a matrix language, but *which* language they opt for if they have to. In addition to that, the very ability to tell the language a sentence is from does not indicate that this knowledge plays any role in language production, as supposed by ML models.

In more recent works, the ML used to be established based on analyses of code-switching corpora. But for the time being, there is no independent evidence that a matrix language is at work. To the contrary, Wentz' study indicates that speakers seem to be unable to decide post hoc about the matrix language of many sentences.

Constructions are, of course, just as hypothetical as the matrix language is. However, they are no specifically bilingual concept and there are insights from different fields that corroborate this



concept. Constructions can be shown to be psycholinguistically (Bencini – Goldberg 2000; Bencini – Valian 2008) and neurolinguistically plausible (Pulvermüller – Knoblauch 2009) and they have already been described within a wide range of linguistic subbranches outside bilingualism: language change and grammaticalization (Diewald 2009; Hilpert 2013; Traugott 2008; Trousdale 2010), language acquisition (Tomasello 2003), and discourse linguistics (Fischer 2006) to name only a few. Most grammatical frameworks indeed do assume that constructions exist (Schönefeld 2006). Therefore, if speakers have to be able to process constructions anyways, it is economical to assume that they process only constructions (Stefanowitsch 2011a).

Different from the notion of "matrix language" (and even "language"), constructions are concrete, testable linguistic units. There are (disputable but) clear-cut criteria as to what can count as a construction. For example, the meaning or function of a construction must not be interpretable via the simple combination of the construction's components. If there are compositional constructions, they must be of high type frequency, so that it is plausible to argue that they have achieved an independent status. If, and only if, a construction is shown to have a specific meaning or function or to be highly frequent can one assume that it may function as unit in the language (Goschler 2011).

The Scope of the Models

All models that explicitly assume the existence of a matrix or base language restrict their predictions to so-called insertional codeswitching. Myers-Scotton named the scope of her model "classical codeswitching" and defines this notion by applying it to cases "in which empirical evidence shows that abstract grammatical structure within a clause comes from only one of the participating languages" (Myers-Scotton – Jake 2010: 337). It often goes unnoticed that this very definition puts the model into an explanatory circle, because

the MLF model is also thought to predict this abstract grammatical structure. The division into insertional and other code-switching is also prominent in Johanson's Code Copying framework, where he excludes non-insertional switches altogether. The code copying strategies he offers hold only for the insertional type (Johanson 1992: 175). The distinction between these two types is most prominently introduced by Muysken, who named them alternation and insertion. He argues that alternation and insertion are distinct strategies that are typical for different bilingual groups (Muysken 2000: 4). Importantly, the only type for which Muysken offers a "grammatical" approach is the insertional one (Muysken 2000: 95).

It is not my aim to argue that the restriction of a model on a specific scope is not appropriate. Restriction is indeed the very nature of every model. However, while restrictions can enhance the explanatory power of a model, they also lower its theoretical relevance (Muysken 2000: 3). Now, for matrix language approaches there are three levels of restrictions that distinguish them from general linguistic models. First, they are restricted to bilingual speech. Second, not all kinds of bilingual speech and contact phenomena are regarded, but only code-switching. Third, from that subset only insertional code-switching is modelled. If we accept that bilingual speech production is not in principle different from monolingual (Abutalebi – Green 2016: 689), it may be useful to find approaches that can incorporate all types of code-switching, other contact phenomena, and maybe do not differ from monolingual processing.

BiCxG uses none of the restrictions. It is not designed for only bilingual speech, incorporates a wide range of bilingual phenomena (see Wasserscheidt 2016a for more details) and makes no distinction between insertional and alternational code-switching. The latter is especially desirable, because it is difficult to argue that insertion and alternation are the result of completely different processing procedures. They can even be found within the same utterance, for example (9):

(9) ... i onda kukuruz kuvani taj *dobozos. Most meg ugye van.* I
and then maize cooked this canned now indeed eh exist and
onda majonez, pečurk -e, svašta i ozgo metu
then mayonnaise mushroom -ACC.PL anything and below add
tejszin -a i kečap.
cream -PART and ketchup
'… and then cooked maize, this canned one. After all, we have it nowadays. And then mayonnaise, mushrooms, anything, and into that they mix cream and ketchup.' (Author's corpus)

It would be odd to assume that the first and the middle part of are the outcome of completely distinct cognitive or 'syntactic' operations. The reason for neglecting alternations and other phenomena that do not have the status of being "classical" code-switches is, as it seems, that in both cases no matrix language can be identified. This indicates that there is not always a matrix in code-switching. The question is now whether alternation indeed represents a strategy different from insertional mixing or whether the underlying notion of matrix language is simply not appropriate for describing bilingual utterances.

BiCxG can easily account for alternational switching which occurs at underspecified slots of schematic constructions above the level of argument structures and does not contradict the "matrix" construction's specifications. Thus, example (10) shows an insertion in one part of the simple Serbian (narrative) listing construction [_ *i* _; 'X and Y'] where the only restriction is that X must have some connection to Y or Y must follow X in time. In the utterance in (11), an object clause introduced by the Hungarian *hogy* 'that' has been inserted into a formally unspecified transitive construction with the verb *vežbati* 'train'.

(11) Tako je bilo da u *Békes- be* • • ćedu zidati **i** nem • *nem egedtek.*
so AUX was that in Békes- ILL AUX build and not not allowed
'It was planned that in Békes … they will build but they didn't allow it.'
(Author's corpus)

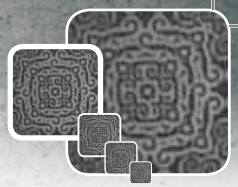
(12) Pa smo išli da vežbamo *hogy hogy kell kigurítani*, …
well AUX went that exercise that how need unroll
'well, and we went to exercise how to unroll (it) ...' (Author's corpus)

Of course, BiCxG accounts also for intersententional code-switching, which can be analysed as the juxtaposition of two independent or non-nested constructions. Thus, the scope of BiCxG is wider in several respects. The counterside of comprehensiveness, however, is often explanatory power. It is important to keep in mind that matrix language approaches are so widespread because of their apparent descriptive adequacy. So, any alternative model should be at least as good in predicting code-switching as matrix language approaches.

Conclusion

In this paper, I have argued that there are at least four hierarchically connected problems with matrix language approaches and other models to code-switching that are based on the use of language affiliation or indexation. The issues discussed are (a) that not every instance of code-switching has a ML and hence ML-based approaches are too narrow, (b) that there is no independent evidence for a ML outside contact linguistics, (c) that ML-based approaches assume the production of languages instead of linguistic units, and (d) that the concept of language in general, and ML in particular, is not suitable for contact linguistics.

The proposed Bilingual Construction Grammar (BiCxG) does not assume the preselection of a language prior to production, but the direct production of linguistic units instead; thus, it avoids too coarse global predictions in favour of construction-specific predictions. Moreover, constructions have a compelling empirical and not exclusively bilingual foundation. I argue that the full production of whole constructions can explain most cases of code-switching, including word-internal mixing and alternations. Because BiCxG includes more general cognitive strategies, the range of bilingual phenomena



that can be explained covers much more than just code-switching. In this model, constructions can form language networks but can also be learned in isolation, so that languages appear to be epiphenomena of the networking mind and mixing takes place not between languages but between constructions. The matrix-language effect can be reinterpreted as by-product of constructional processing. Instead of using the term matrix language it is thus more appropriate to speak of matrix constructions.

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