Modelling Language Mixing - Which Questions Matter?

Philipp Wasserscheidt

Introduction

The field of sociolinguistic, psycholinguistic and cognitive models trying to explain the speech process and the mixed output of bilinguals is wide. Much work has been done in order to verify different hypotheses. But although they all ask important questions, **none of them seems to be able to fully explain language mixing** (I define language mixing as the overt or covert result of bilingual speech production in general).
Even if we accept the fact that most research focuses on rather specific problems, the question remains whether this failure is due to theoretical shortcomings or to the questioning. These two points are probably not dissolvable, because every theory comes with a set of typical questions and does not allow others (Generative approaches, which usually fail to model language mixing, would never ask for the motivation for language mixing).
But since none of the existing approaches is able to provide a sufficiently broad (in terms of the phenomena included) and exact (with regards to the outcome of speech production) explanation, we have to step back and ask the original question: „**How do speakers combine elements from two codes into one single utterance?**".

State of Research

It has to be admitted that a **model of bilingual language production** in this strict sense does not exist. However, a range of models has been developed in order to explain different mechanisms, phenomena and relations.
The sociolinguistic tradition has born a lot of approaches with regards to code-switching. The first ones are known to be the constraints on code-switching proposed by Poplack[1] (1981). They focus mainly on word order.
Other models explain why speakers code-switch in different settings or with different interlocutors. Only three models deal directly with proper speech production. The best known is the Matrix Language Frame Model (MLF[2]) which mainly asks for the constraints for code-switching within a semi-psychological approach by trying to extend Levelt's proposal. De Bot also proposed a Bilingual Production Model (BPM[3]) based on Levelt. The only model concentrating on the motives for the use of elements from different languages is the lesser known Dual Language Model (DLM[4]) which is, among others, based on Grosjean's language modes.

There are some cognitive models dealing with bilingual language processing. The Implicit-Explicit Model (IEM[5]) states that the L1 is used more automatically, while the L2 has to rely on explicit memory. BIA[6] tries to explain the processes underlying bilingual word recognition, especially the recognition of interlingual homographs. The same task with a focus on spoken word recognition is the objective of BIMOLA[7]. With regards to language production, Green has proposed the highly debated Inhibitory Control Model (IC[8]) which explains how tasks and language switches are handled by the supervisory system. The self-organizing network SOMBIP[9] models the emergence of the bilingual lexical storage and language membership with the help of frequency.
But not only has the development of distinct models been addressed. The different questions concerning (bilingual) speech production, language control, code-switching etc. have often been subject to scientific debates.

Objectives

The modeling of bilingual language production seems to be stuck in its development. On the one hand, much research has been conducted with regards to the processing of **single words**. On the other hand we have a huge corpus of research on the phenomenon of **intrasentential code-switching**. Paradoxically, the latter has often been explained with models developed only for single word utterances. But between the neuro- and psycholinguistic data and the syntactical approaches remains a huge gap, since it is not at all clear how lexical-driven modeling could be expanded to **include syntactical encoding**. This holds true even more for bilingual speech production. Since syntactical question are generally only explainable within the framework of a particular theory, this would mean that a general discussion of the underlying assumptions for syntactical processing is needed.
I conduct a meta-analysis of some of the best known models for bilingual language processing and retrieve the main questions from every model. In order to judge them, I compare them to a matrix of issues from a wide range of socio-, psycho-, and neurolinguistic research literature.

Results.

As predicted, the models focus on partially entirely different issues. Here I give only a short synopsis of their main questions. To be sure: They do pose much more questions, but I tried to filter the most general ones that have the strongest relation to language mixing.

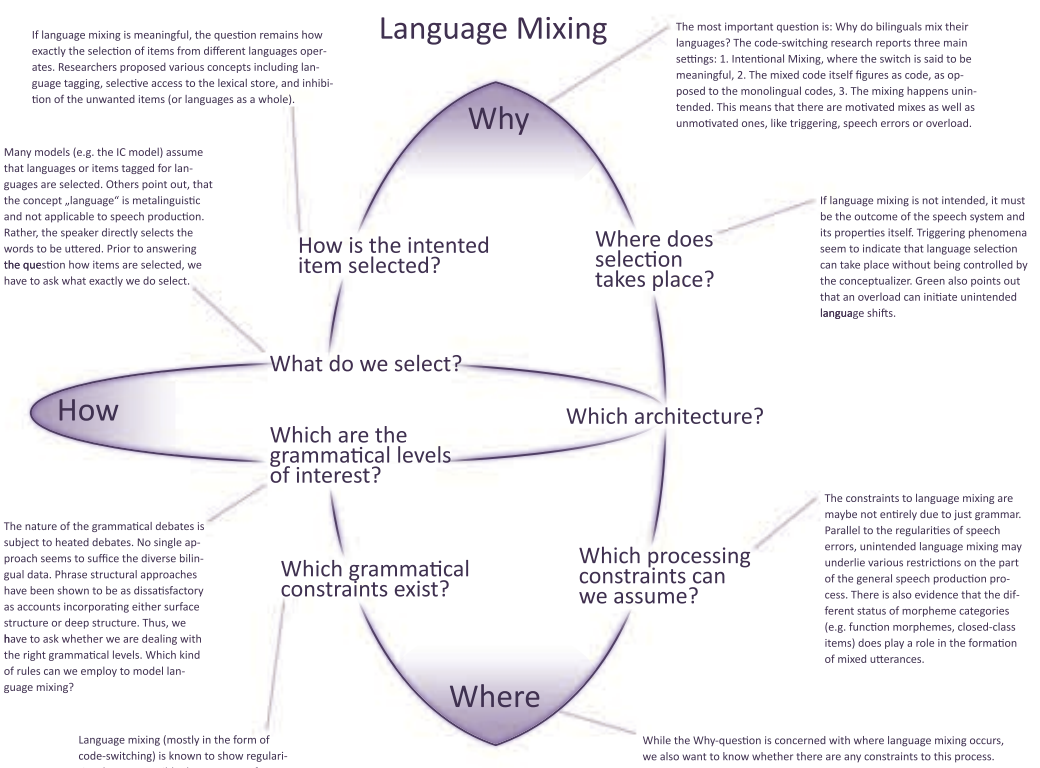
		Focus on: Why	Where	How	**Explains:** selection	recognition	constraints	control
Dual Language Model:	Why do speaker use words from different languages?	●			●			
Inhibitory Control Model:	How do speaker control their language use?			●	●			●
Matrix Language Frame Model:	Where can we expect codeswitching?		●		●		●	
Poplack's Contraints:	Where can we expect codeswitching?		●				●	
Bilingual Production Model:	How do bilinguals produce speech (words)?			●	●			
Implicit-Explicit Model:	Which role does automatization play in bilinguals?			●				
BIA:	How are written words associated with languages?			●		●		
BIMOLA:	How are words from the other language are recognised?			●		●		
SOMBIP:	How is language membership achieved?			●	●	●		

I compared this result to the questions most often mentioned in bilingualism research and noticed that

1. the **level of description** is seldomly mentioned. All models, however, select one or more levels for their task. Almost none of them is dealing with high scale (locating speech in discourse or action) or low scale (neurolinguistic) issues. Most of them deal with mechanisms between the conceptual level and the phonological level.
2. only one of these models deals with the question **why** bilinguals actually mix languages. This is surprising, since this is by far the most often mentioned issue, dealed with in nearly every sociolinguistic publication.
3. most models ask **how** bilingual language production can be modelled and so reflect the overall discussion.

Discussion

These results show, that researchers are mainly concerced with explaining the concrete mechanisms of bilingual speech production or language mixing. But as already mentioned, most of the explanations are not satisfying and reveal a number of counter evidences. If language mixing really follows whatsoever regularity, then it would be appropriate to step back and try to answer the questions that deal with more general (and more theoretical) issues. Which are the questions that really matter after all?



If language mixing is meaningful, the question remains how exactly the selection of items from different languages operates. Researchers proposed various concepts including language tagging, selective access to the lexical store, and inhibition of the unwanted items (or languages as a whole).

Many models (e.g. the IC model) assume that languages or items tagged for languages are selected. Others point out, that the concept „language" is metalinguistic and not applicable to speech production. Rather, the speaker directly selects the words to be uttered. Prior to answering the question how items are selected, we have to ask what exactly we do select.

The most important question is: Why do bilinguals mix their languages? The code-switching research reports three main settings: 1. Intentional Mixing, where the switch is said to be meaningful, 2. The mixed code itself figures as code, as opposed to the monolingual codes, 3. The mixing happens unintended. This means that there are motivated mixes as well as unmotivated ones, like triggering, speech errors or overload.

If language mixing is not intended, it must be the outcome of the speech system and its properties itself. Triggering phenomena seem to indicate that language selection can take place without being controlled by the conceptualizer. Green also points out that an overload can initiate unintended language shifts.

The nature of the grammatical debates is subject to heated debates. No single approach seems to suffice the diverse bilingual data. Phrase structural approaches have been shown to be as dissatisfactory as accounts incorporating either surface structure or deep structure. Thus, we have to ask whether we are dealing with the right grammatical levels. Which kind of rules can we employ to model language mixing?

The constraints to language mixing are maybe not entirely due to just grammar. Parallel to the regularities of speech errors, unintended language mixing may underlie various restrictions on the part of the general speech production process. There is also evidence that the different status of morpheme categories (e.g. function morphemes, closed-class items) does play a role in the formation of mixed utterances.

Language mixing (mostly in the form of code-switching) is known to show regularities that are possibly the outcome of grammar specific constraints.

While the Why-question is concerned with where language mixing occurs, we also want to know whether there are any constraints to this process. Many researchers assume that there are in fact constraints, but their nature is highly debatable. We can distinguish two mechanisms possibly restricting language mixing: grammatical rules and the speech production apparatus itself (unless they are one and the same).

Conclusion.

My results imply that future research on bilingual speech production and language mixing should focus on the three question „**What is selected**", „**Which are the grammatical levels of interest**" and the **architecture** of the processing system. The combination of these question seems to be at odds with the research tradition. But a closer look at the phenomena of interest shows, that language mixing is not all about words and grammatical rules. Rather, existing studies seem to indicate that constructions may help a lot to get to grips with bilingual language use. Ad Backus devoted a whole publication to „long units"[10]. And even Levelt admitted, that „whole messages will be available in long-term memory"[11]. The importance of usage and freqency has been underlined by a range of researchers[12, 13]. A **Construction Grammar approach to language production** could give an answer to two of the question mentioned at one go, since the grammatical level would coincide with the items selected for production. This would allow to include syntactical issues.

Bibliography

1 Poplack, Shana. "Sometimes I'll start a sentence in Spanish Y TERMINO EN ESPANOL: Toward a typology of code-switching." Linguistics 18.7/8 (1980): 581-618.
2 Myers-Scotton, Carol. Contact linguistics: Bilingual encounters and grammatical outcomes. Oxford linguistics. Oxford: Oxford Univ. Press, 2002.
3 de Bot, Kees. "A bilingual production model: Levelt's 'speaking' model adapted." Applied Linguistics 13 (1992): 1–24.
4 Kecskes, Istvan. "The dual language model to explain code-switching: A cognitive-pragmatic approach." Intercultural Pragmatics 3.3 (2006).
5 Paradis, Michel, Hg. A neurolinguistic theory of bilingualism. Amsterdam: Benjamins, 2004.
6 Dijkstra, Ton. "From tag to task: Coming to grips with bilingual control issues." Bilingualism: Language and Cognition 1 (1998): 88–9.
7 Grosjean, François. "Studying bilinguals: Methodological and conceptual issues." Bilingualism: Language and Cognition 1 (1998): 131–49.
8 Green, David W. "Mental control of the bilingual lexico-semantic system." Bilingualism: Language and Cognition 1 (1998): 67–81.
9 Li, Ping und Igor Farkas. "A self-organizing connectionist model of bilingual processing." Aus Li Wei. Bilingual Sentence Processing. Hg. R. Heredia und Jeanette Altarriba. Amsterdam, 2002: 59–85.
10 Backus, Ad. "Units in code switching: evidence for multimorphemic elements in the lexicon." Linguistics 41.1 (2003): 83–132.
11 Levelt, Willem J. M. Speaking: From intention to articulation. 5. print. ACL-MIT Press series in natural-language processing. Cambridge, Mass.: MIT Press, 1998.
12 Paradis, Michel, Hg. A neurolinguistic theory of bilingualism. Amsterdam: Benjamins, 2004.
13 Muysken, Pieter. Bilingual speech: A typology of code-mixing. Digitally printed 1. paperback ed. Cambridge u.a.: Cambridge Univ. Press, 2005.

contact: wasserscheidt@gmx.de