



Syntactic alignment and shared word order in code-switched sentence production: Evidence from bilingual monologue and dialogue

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ABSTRACT

In four experiments, we investigated the role of shared word order and alignment with a dialogue partner in the production of code-switched sentences. In Experiments 1 and 2, Dutch–English bilinguals code-switched in describing pictures while being cued with word orders that are either shared or not shared between Dutch and English. In Experiments 3 and 4, the same task was embedded in a confederate-scripted dialogue situation, and the confederate's use of word order and sentence position of switching was manipulated. We found that participants had a clear preference for using the shared word order when they switched languages, but also aligned their word order choices and code-switching patterns with the confederate. These findings demonstrate how the integration of languages in sentence production depends on processes of syntactic co-activation between languages and on processes of alignment between dialogue partners, and extend the notion of interactive alignment to bilingual speech and code-switching.

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Introduction

One of the most fascinating phenomena in bilingual speech is code-switching. This merging of two languages within a coherent utterance is one of the few reflections of co-activation of languages in natural discourse, and reveals the true flexibility of language processing. Code-switching is quite frequent among bilinguals (Wei, 2007), especially in informal dialogue settings in which interlocutors can freely use both their languages (Grosjean, 2001).

Experimental studies on code-switching (in psycholinguistics often termed *language switching*) have mainly examined lexical processes. Language production studies typically focused on the time-course of producing language switches in word naming (e.g., Christoffels, Firk, & Schiller, 2007; Costa & Santesteban, 2004; Meuter & Allport, 1999;

see Meuter, 2005, 2009, for reviews), and perception studies mainly considered the processing of switches in and out of a sentence context (e.g., Li, 1996; see Van Hell & Witteman, 2009; Altarriba & Basnight-Brown, 2009, for reviews). Typical of these studies is that they are restricted to single-word switches at fixed points within a sentence or stimulus list. In natural discourse, however, code-switching includes more than this externally induced switching of single words. It consists of the integration of two languages within a coherent sentence that is internally generated by the speaker him/herself and situated in a rich discourse context (Gullberg, Indefrey, & Muysken, 2009). This not only involves lexical processing but also syntactic and discourse processing. These syntactic and discourse processes in code-switching are the topic of the present study.

In four picture-driven sentence-completion experiments, we examined how Dutch–English bilinguals' syntactic choices in code-switching are influenced by cross-language word order equivalence and alignment with a dialogue partner. Experiments 1 and 2 investigated cross-language

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word order equivalence in code-switching in monologue and Experiments 3 and 4 examined the further influence of an interlocutor in dialogue. The tasks were constructed such that we kept experimental control over manipulated variables, but left participants free to generate the grammatical form and syntactic positioning of their code-switches themselves. This enabled us to study the cognitive mechanisms of relatively free code-switching in experimental conditions.

We build on the interactive alignment model of dialogue processing (Pickering & Garrod, 2004). This model captures many aspects of syntactic processing in dialogue, but has not yet been extended to code-switching. An important goal of our study is, therefore, not only to investigate syntactic choice of code-switches in monologue and dialogue, but also to widen the scope of the interactive alignment model to bilingual processing in dialogue. We will now first give an outline of the interactive alignment model, followed by a description of bilingual sentence production and syntactic choice in code-switching.

The interactive alignment model in a nutshell

Based on the argument that dialogue – and not monologue – is the basic setting of language use, Pickering and Garrod (2004) proposed the interactive alignment model to account for the cognitive mechanisms of language processing in dialogue. As explained by these researchers, the goal of dialogue is not just to encode a message, but to get a message *across* and to obtain mutual understanding. This is essentially a cooperative process (see also Clark, 1996; Grice, 1975), in which dialogue partners build on each other's language and copy elements of each other's expressions. This alignment of linguistic behavior not only aids mutual understanding but also facilitates language production, as it enables speakers to make 'shortcuts' in

their own language production process (Garrod & Pickering, 2004; Schober, 2006).

Evidence for alignment is well established. In both experimental and naturalistic studies, dialogue partners have been found to repeat each other's words, syntactic structures, and even articulation in the production of utterances. Alignment effects have been found in different languages and speaker populations, including adults (e.g., Branigan, Pickering, & Cleland, 2000; Gries, 2005; Levelt & Kelter, 1982; Pardo, 2006), children (e.g., Huttenlocher, Vasilyeva, & Shimpi, 2004), second language learners (Costa, Pickering, & Sorace, 2008; McDonough, 2006), and deaf children (Van Beijsterveldt & Van Hell, 2009). It has been also been found that alignment at one level, such as the lexical level, enhances alignment at other levels, such as the syntactic level (e.g., Branigan et al., 2000; Schoonbaert, Hartsuiker, & Pickering, 2007). For a comprehensive review of alignment findings, see Pickering and Garrod (2004).

The interactive alignment model (see Fig. 1) accounts for these alignment effects by assuming a coupling of interlocutors' linguistic representations at all levels of linguistic processing (horizontal arrows). The model further assumes a coupling of interlocutors' situation models (i.e., one's mental representation of the discourse situation at hand; cf., Zwaan & Radvansky, 1998), which represents mutual understanding. These situation models are directly connected with the linguistic representations (semantics, lexicon, syntax, phonology, articulation) that are activated and selected during speech production and comprehension (vertical arrows). The interconnectivity within (vertical arrows) and between (horizontal arrows) dialogue partners enables alignment to occur: Activated linguistic representations resonate through the interlocutors' language processing systems, which increases the likelihood that

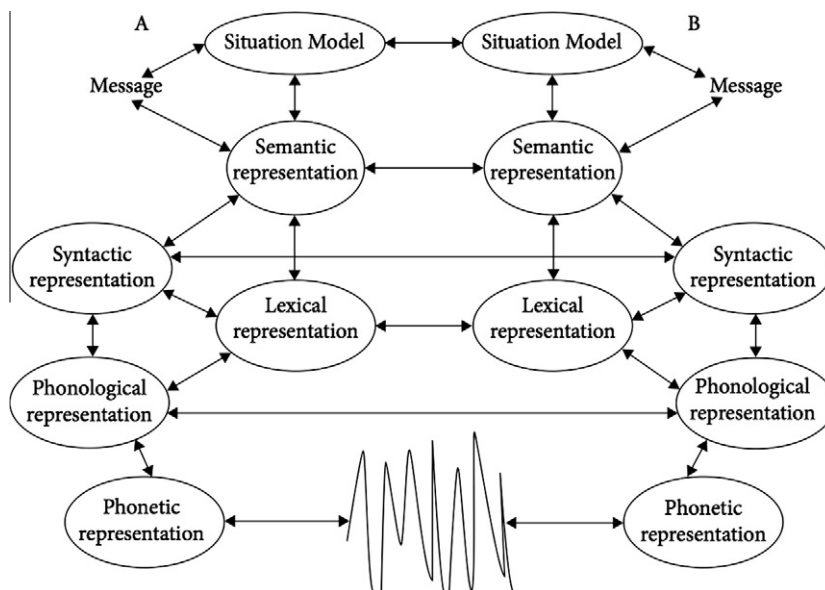


Fig. 1. The interactive alignment model. 'A' and 'B' refer to dialogue partners A and B. Reproduced from Pickering and Garrod (2004, p. 176) with permission from the authors Cambridge University Press.

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