

## **Constraints on Code-Blending: Distributions of Pointing Subjects and Objects in Bimodal Bilingual Children**

We investigate syntactic constraints on the distributions of pointing signs functioning as subjects and objects in the productions of Bimodal Bilingual (Bibi) children, i.e. children acquiring a sign language and a spoken language, comparing them with similar points produced by a monolingual ASL-learning Deaf child and two monolingual English-learning hearing children (Table 1).

We examined the use of points picking out the subject or object referent, whether the point was the only indication of the referent or coreferential with a spoken or signed NP. In the sign languages, pointing functions like a pronoun; as such it can be combined with the spoken language in ‘code-blending’, the bimodal analogue to code-switching. Note that our use of the terminology ‘argument’ is meant to be neutral between linguistic syntactic arguments for the signing participants and co-speech gestures in the non-signers.

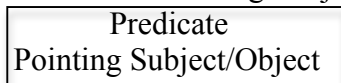
We analyzed the position of the pointing vis-à-vis the predicate (produced in speech and/or sign): pre-predicate (1a), post-predicate (1b), or pointing produced simultaneously with the predicate, i.e. overlapping (1c). The results (Figure 1) show that the monolingual English speaking children do not differentiate the positions of their pointing gestures co-referential with arguments, i.e. they almost always produce both their subject points and object points overlapping with the predicate. We take this to be a consequence of the fact that pointing is paralinguistic, hence not generated by the computational system, for these children.

On the other hand, there are differences between the distributional frequencies of subject points and object points in the productions of Bibi and Deaf children. Both ASL and Libras have basic SVO word order, which is reflected in the most frequent position of the points, and both have reordering operations (employed more frequently by Aby and Ben) to produce VS and OV. Most importantly, there is an asymmetry in the use of overlapping points for the Bibi children: Subject points are (almost always) separated from their predicates, while object points are potentially produced simultaneously with their predicates.

We account for the difference between the distribution of subject points and object points in the productions of Bibi children by appealing to the Language Synthesis Model (Lillo-Martin et al. 2012, 2016), which allows for abstract roots and morphemes from either language to be entered into a derivation and, in the case of bimodal bilinguals, realized by vocabulary items from either or both language simultaneously. Here we expand the model by adding in a derivation-by-phase component (Chomsky 1999 et seq.), which was originally applied by Berent (2012) in constraining code-blending. Specifically, we propose following Berent that elements within a single phase can be produced simultaneously when articulatory mechanisms allow. In the productions of Bibi children discussed here, a subject point ends up in a higher phase than the predicate (outside  $\nu$ P) and thus it is separated from the predicate in production, while an object point can stay inside the same phase with the predicate (inside  $\nu$ P) and thus it can be generated blended simultaneously with the predicate (2). There are a few exceptions to the expectation that subjects are not produced overlapping with the predicate. Most of these are cases in which the pointing sign actually touches the object referred to; the point begins before the predicate but the touching continues while the rest of the sentence is produced.

Our proposal contributes to understanding how the syntax-phonology mapping in bimodal bilingualism is constrained without adding any additional theoretical tool than what is already substantiated for explaining the syntax of monolingual individuals (following the basic insight of MacSwan 2000).

- (1) a. ... Pointing Subject/Object ... Predicate ...  
 b. ... Predicate ... Pointing Subject/Object ...  
 c. ...



Separated  
from predicate

Code-blended  
with predicate

Separated  
from predicate

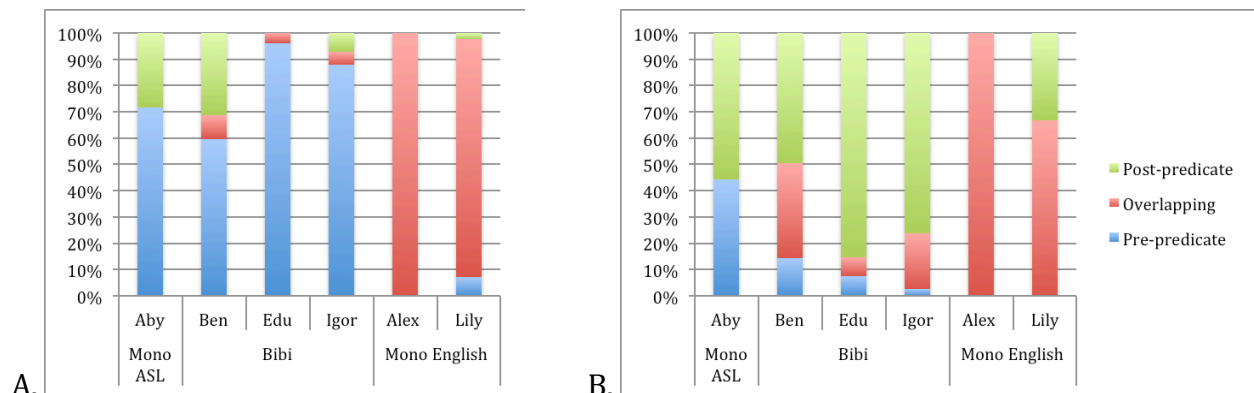
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- (2) a. [Subject [vP Subject [VP Predicate Object] Subject]

Syntax

Group	Participant	#Sessions	Child's Age Range	#Pointing Subjects	#Pointing Objects	Total
<b>Mono ASL</b>	Aby (Deaf-ASL)	5	2;02-3;03	92	27	119
<b>Bibi</b>	Ben (US)	8	2;00-3;00	189	105	294
	Edu (BR)	6	2;00-3;03	25	20	45
	Igor (BR)	6	2;02-3;01	255	76	331
<b>Mono Engl</b>	Alex	5	2;00-3;05	2	23	25
	Lily	3	2;00-3;00	44	12	56

**Table 1.** Participants



**Figure 1.** A) Distribution of Subject points; B) Distribution of Object points

**Selected References**

Chomsky, N. (1999). *Derivation by phase*. MIT, Department of Linguistics.  
 Berent, G. P. (2012). Sign Language–Spoken Language Bilingualism and the Derivation of Bimodally Mixed Sentences. *Handbook of Bilingualism & Multilingualism, 2nd Ed.*, 351-374.  
 MacSwan, J. (2000). The architecture of the bilingual language faculty: Evidence from intrasentential code switching. *Bilingualism: Language and Cognition, 3*, 37-54.