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This is a contribution from *Linguistic Approaches to Bilingualism 4:3*
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What impact does ambiguous input have on bilingual language acquisition?

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Bilingual language acquisition research has been concerned with distinguishing the impact of age of onset and input quantity on the time course and outcomes of language acquisition. The keynote article by Tsimpli (this volume) is a welcome contribution to this discussion. Tsimpli aims to reconcile previous acquisition research findings by proposing that the impact of age of onset and of input quantity on bilingual language acquisition is directly linked to the particular property of the language being acquired. Working within a generative linguistics perspective, she distinguishes between two types of linguistic properties: core syntactic properties vs. syntax external properties. She characterizes core syntactic phenomena as properties determined by Universal Grammar (UG) and as what characterizes languages into types. According to Tsimpli, core syntactic properties are the earliest phenomena acquired in monolingual development and, as such, the impact of input quantity on the acquisition of these properties must be minimal in bilingual language acquisition. On the other hand, she notes that syntax-external properties are acquired late in monolingual development and, as such, should be more susceptible to input quantity in bilingual language acquisition. In this commentary we focus our discussion on Tsimpli's argument concerning the role of input quantity (or lack thereof) on the acquisition of core syntactic properties in bilingual language acquisition

In our view, Tsimpli's proposal underestimates the role of the input in the acquisition of core syntactic phenomena in that she limits her discussion to the issue of 'input quantity', overlooking the possible effect of ambiguous input on language acquisition. Ambiguity in the input can arise when forms are variably or inconsistently produced by adult speakers. Take, for example, the variable omission of the auxiliary 'do' in English (e.g. (Do) You wanna eat?; What (does) he want for Christmas?), where adult speakers sometimes omit and sometimes produce the auxiliary 'do', depending on a number of linguistic and sociolinguistic factors (e.g. SES, speech style) (Fitzpatrick, 2006; Miller, 2012, 2013b). Or, note the

inconsistent use of gender marking in Fering (a North Frisian language), where bilingual Fering-German adult speakers produce both masculine determiners and common gender determiners interchangeably with the same set of Fering nouns, and neither linguistic nor sociolinguistic factors seem to predict the alternation of the two forms (Hendricks, under review, 2012; Hendricks, Miller, & Jackson in prep; but see Ebert, 1998; Parker, 1993). What impact might this type of input have on acquisition?

Tsimpli touches on the idea of input ambiguity when she notes that in addition to acquiring the correct setting of the Null Subject Parameter — which may be instantiated as acquisition of a D feature on T (Roberts & Holmberg, 2010) — children must also acquire the extra-syntactic (non-categorical) constraints (e.g. topic shift, contrastive focus) governing usage of null vs. overt subjects, which her proposal correctly predicts will be acquired late (Shin & Erker, forthcoming). Late acquisition of the extra-syntactic constraints, however, implies that initially — before these constraints are acquired — the input evidence for the Null Subject Parameter (i.e., a D feature on T) may appear ambiguous to the learner. In other words, the input would appear to the learner to provide evidence both for and against a D feature on T because the learner does not yet have knowledge of the extra-syntactic constraints governing the usage of null vs. overt subjects. The question that we ask is whether this sort of ambiguous input can impact the acquisition of core phenomena like the Null Subject Parameter in bilingual children (for more on the acquisition of the Null Subject Parameter in the context of an ambiguous input see Miller & Champi, in prep; Villa-Garcia, Snyder, & Riqueros-Morante, 2010).

Both types of input (i.e., variable input and inconsistent input) have been shown to delay acquisition of grammatical features in monolingual children (Hudson Kam & Newport, 2005; Johnson, 2005; Miller & Schmitt, 2012; Miller, 2007, 2012, 2013b). As an example, the plural marker /-s/ is variably omitted in Chilean Spanish and there is evidence that children exposed to this dialect do not acquire nominal plural morphology until around 4 years of age, while children exposed to dialects of Spanish with consistent plural marking (i.e., the plural marker is never omitted on plural nouns) do so by 3 years of age (Marrero & Aguirre, 2003; Miller & Schmitt, 2010, 2012, 2013; Miller, 2007, 2013a). Likewise, English-speaking children exposed to variable production of non-agreeing *don't* (e.g. She don't/doesn't know John), take longer to acquire agreement marking on the auxiliary 'do' than do children exposed to an input with consistent use of agreeing *doesn't* (e.g. She doesn't know John). What's more, until agreement marking on the auxiliary is acquired, these children produce utterances with non-agreeing 'do', as shown in (1), even though only (1c), but not (1a) or (1b), are allowed in the adult grammar. This latter finding indicates that children sometimes overgeneralize

the absence of agreement on non-agreeing *don't* to all tokens of the auxiliary 'do' (Miller, 2012, 2013b).

- (1) a. He do too!
- b. Do your dad have a pencil?
- c. He don't have a pencil.

Similar findings of overgeneralization have been reported in Yang et al. (2013), who found that variable omissions of the third singular (3sg) *-s* on main verbs in the input to African American English-speaking children (e.g. *She walk to school*) impacts their acquisition not only of 3sg *-s*, but also of past tense morphology.

Yang's (2002) Variational Learning Model (VLM) provides a way to take input properties into account within the confines of Universal Grammar (UG). The VLM makes at least two predictions for the topic at hand: (1) Children exposed to an input where a grammatical form is ambiguously produced (i.e., sometimes produced and sometimes omitted) will take longer to acquire the linguistic feature associated to that form than children exposed to a consistent input; and (2) The reduced input quantity to bilingual children should impact their acquisition of core syntactic phenomena (contrary to Tsimpli's proposal). Under the VLM, language acquisition is a probabilistic competition process among hypotheses about the emerging grammar, hypotheses made available by UG (see Yang 2002 and references therein). The VLM proposes that the learner associates probabilities with these innate hypotheses. Upon hearing an input token, the learner probabilistically selects a hypothesis to analyze the token. If it is parsed successfully, the selected grammar is rewarded and its probability goes up. If the hypothesis fails to parse the input token, its probability is lowered. The model gradually eliminates any hypothesis that is only compatible with a portion of the input data, and does so more quickly when input quantity is increased and when the input for the particular feature is consistently produced.

Tsimpli offers subject-verb agreement in null subject languages as an example of a core syntactic property. She argues that subject-verb agreement is acquired surprisingly early in languages like Spanish and should, therefore, require very little input exposure. An alternative proposal — put forth by Legate & Yang (2007) — is that the frequency of unambiguous input for subject-verb agreement drives the time-course of the acquisition of subject-verb agreement. Evidence comes from revisiting the Optional Infinitive (OI) Stage — which they instantiate as a competition between a [+T] grammar v. [-T] grammar — in Spanish, French, and English-speaking children. In spoken language, Spanish provides the highest frequency of unambiguous evidence for subject-verb agreement (i.e., inflected verbs), followed by French, and then English and this corresponds to the duration of the OI Stage in each language: English-speaking children take the longest to acquire a

[+T] grammar, followed by French-speaking children, and then Spanish-speaking children. If ambiguous input impacts acquisition of core syntactic phenomena in monolingual children, what impact might ambiguous input have on bilingual language acquisition, where the input quantity is also reduced?

In a recent study — one of the few studies we know of that discusses the impact of ambiguous input on bilingual language acquisition — Pirvulescu et al. draw on the VLM to explain English-French bilingual children’s acquisition of pronominal direct objects in a context of an ambiguous input. Pirvulescu et al. note that, while French and English are considered non-null argument languages, there are structures in both English and French that could be interpreted as having null objects. Examples are provided in (2).

- (2) a. *Ça j’ai vu* (data taken from Pirvulescu et al., 2013)
 that I have seen
 “‘That, I have seen”
 b. Let’s eat.
 c. John aimed at the target and missed.

According to the authors, the input for null object pronouns is ambiguous because utterances like those in (2) provide evidence for null object pronouns while overt pronominal objects provide evidence against null object pronouns. Their results show that bilingual children omit direct object pronouns for a much longer period of time than do their monolingual peers and they argue that this delay in acquisition is due to both the ambiguity in the input and the overall reduced input quantity to bilingual children. Although only one study, the findings suggest that both ambiguous input and input quantity play a role in the acquisition of core syntactic properties.

In sum, while we applaud Tsimpli’s attempts to synthesize research findings in monolingual and bilingual language acquisition in order to account for the effects of age of onset and input quantity, we believe that a major limitation of the proposal is that it ignores the role of ambiguous input on the acquisition of core syntactic properties. Ambiguous input can have multiple sources. Sociolinguistic variation can cause ambiguity in the input until the variable rules constraining the use of the variant forms is acquired (Miller, 2007, 2012, 2013a, 2013b; Yang et al., 2013). Inconsistent input produced by non-native speaking parents to their children can cause ambiguity in the input (Hudson Kam & Newport, 2005), and ambiguity can arise even when forms occur categorically but are consistent with more than one grammar/hypothesis (Legate & Yang, 2007; Pirvulescu, Pérez-Leroux, Roberge, Strik, & Thomas, 2013). If findings from research on monolingual acquisition are to inform bilingual acquisition, then we believe that the effect of input ambiguity will need to be taken into account.

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