

Gesture repertoire and early pragmatic skills predict first vocabulary independently in infants exposed to one or more languages

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Children's early non-verbal communication skills (e.g. gesture and pragmatics) have long been known to be an important predictor of verbal language (such as, syntax and lexicon), with a crucial role in the acquisition of oral language (Bates et al., 1979). For instance, many authors show a strong association between gestures usage and later language development, especially the early receptive and productive vocabulary in children above two years old (Brooks & Meltzoff, 2008; Goldin-Meadow, 2016; Rowe & Goldin-Meadow, 2009). These findings are also evident in children exposed to more than one language (Serratrice, 2018), with some researchers even showing enhanced abilities in multilingual populations (Nicoladis, 2007 for a review; Nicoladis et al., 2009). Similarly, early pragmatic skills (e.g. turn-taking, joint attention) have been linked to early vocabulary development, both in children exposed to one and to several languages (Aubineau et al., 2017; Tomasello & Farrar, 1986). However, to our knowledge, the relative strength and independence of these associations has not yet been assessed comprehensively in mono- and bilingual populations.

We therefore set out to investigate the relevance of gesture and pragmatic skills for early receptive and productive vocabulary as part of a larger study using online parental questionnaires and short live interaction tasks. 64 parents of young babies with single (n=33, Swiss French) or multiple (n=31, Swiss French + different other languages) language exposure filled in a questionnaire concerning the repertoire of gestures used by their child at 8 months (adapted from the MacArthur-Bates Communicative Development Inventories, Fenson et al., 2006). In addition, a short play session with an experimenter was held at the University's Babylab to assess the young participants' pragmatic skills at this age (see Figure 1). We coded their participation and interaction managing, joint attention, and object permanence skills (inter-rater reliability available for the conference). Four months later, parents filled in a questionnaire concerning the first words understood and produced by their child at 12 months - for children exposed to more than one language in all languages - (multilingual questionnaire adapted from the different language versions of the MacArthur-Bates Communicative Development Inventories, Fenson et al., 2006).

In our preliminary analyses, we first investigated whether there was an impact of linguistic exposure on the gesture repertoire of young 8-month-old babies, as one may expect an advantage for multilingual babies following Nicoladis (2007). However, our results suggest that this is not the case ($p > .1$). This is also not the case as far as pragmatic skills are concerned (Laval, 2019), where results do not differ across the two groups ($p > .1$). We then calculated receptive and productive conceptual vocabulary scores for mono- and multilingual children, counting all concepts for which they knew a label in at least one language. As in previous research (De Houwer et al., 2014; Pearson et al., 1993), these were similar across both groups (all $p > .1$).

In a second step, we analyzed the link between gesture repertoire and pragmatic skills at 8 months on the one hand, and the link between these skills and the production and comprehension of first words at 12 months on the other (collapsing across both groups since we did not find any differences before). Interestingly, we found that reported gesture repertoire and live pragmatic skills did not correlate significantly with each other ($r = .104$; $p > .1$), but both correlated with receptive vocabulary (Gesture repertoire: $r = .514$; $p < .05$; pragmatic skills: $r = .255$; $p < .05$, see Figure 2 for an illustrative scatterplot of gestures and receptive vocabulary). Gesture repertoire is also correlated with productive vocabulary at 12 months ($r = .240$; $p < .05$), but not pragmatic skills ($r = -.138$; $p > .1$). For gesture repertoire, the correlations remained significant even when controlling for other factors such as gender, level of parental education and pragmatic skills in partial correlations (receptive vocabulary: $r = .463$; $p < .01$; receptive vocabulary $r = .258$; $p < .05$). Our results show that gesture repertoire seems to play an important role in its own right in the acquisition of first words, in particular on the receptive side, both in infants with single and multiple language exposure. Indeed, it seems to be even more strongly associated with vocabulary than general pragmatic skills, although the interpretation of this comparison should be nuanced due to the different methodologies with which data were collected (parental questionnaires vs. live interaction with an experimenter).

By the time of the conference, we will gather further data and we project further analyses in order to further elucidate the role of gestures for early vocabulary development in mono- and bilingual children. We are currently coding infants' active usage of gestures during our live pragmatic tasks, which will allow us to address the methodologic issue raised above. We are also following up our cohort at 18 months, thus being able to present detailed analyses on lexical growth. Finally, we will run a comprehensive analysis of these links in by means of multiple regressions, allowing us to study whether the link between gestures and verbal language is stronger in children exposed to multiple languages, as the greater reliance on gestures in this population found by some authors (Mayberry & Nicoladis, 2000) may suggest. We will discuss the implications of our results for early language assessment and language support in mono- and multilingual populations.

Index Terms: gesture repertoire, infants, bilingualism, pragmatics



Figure 1: example of one of the three pragmatic tasks: “say hello to puppet fox and hide it”

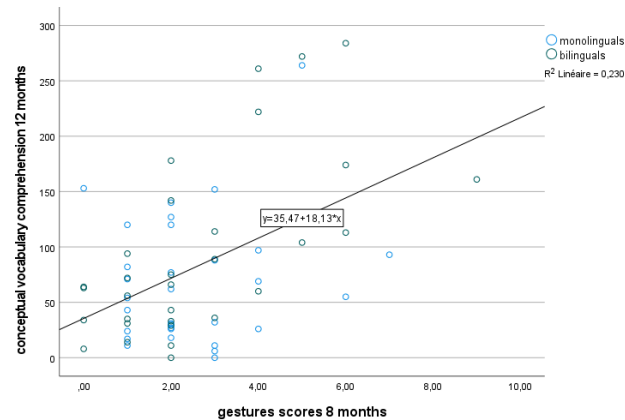


Figure 2: correlation between conceptual vocabulary comprehension at 12 months and gesture repertoire scores at 8 months for bilingual and monolingual children

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