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DISCUSSION

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Comprehension matters: a commentary on 'A multiple process solution to the logical problem of language acquisition'

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MacWhinney (2004) has provided a clear and welcome synthesis of many strands of the recent research addressing the logical problem of first language acquisition from a non-nativist or non-generative grammar framework. The strand that I will comment on is the one MacWhinney calls the 'pivot' of his proposal, namely, that acquiring a grammar is primarily a function of learning ITEM-BASED PATTERNS (e.g. pp. 23–29, 41, *passim*). These item-based patterns serve a number of dominant roles within MacWhinney's proposal, including enforcing children's conservatism (thereby reducing greatly their overgeneralizations and need to recover from the same), supporting the probabilistic nature of grammar, and enabling the competition that promotes recovery from the overgeneralizations that do occur. My concern here is primarily with the first role, that of enforcing children's conservatism, and especially with the exclusive use of language PRODUCTION as the demonstrated support of this conservatism.

MacWhinney's entire discussion of the logical problem of language acquisition, and of its myriad solutions, considers only children's speech production as relevant data. For example, his evaluation of Chomsky's (1980) claims of innately guided structure dependence hinges on 'when children first produce such sentences' (p. 10), and his consideration of which constructions might elicit error-free (or low-error) learning again relies only on what children have been known to *say*. Furthermore, his detailed presentation of children's conservatism and their very low rate of overgeneralization (pp. 23–29) considers only evidence from children's productions for their restricting their grammar to their input. Part of this reliance on production surely draws from the (early) equivalent reliance on production data on the nativist side (e.g. Chomsky, 1980; Grimshaw, 1981; Pinker, 1984), where the argument was indeed cast in terms of what children would and wouldn't say. However, the past 20 years have produced new paradigms for assessing the language COMPREHENSION of very

young children – even preverbal children – and these paradigms (e.g. Intermodal Preferential Looking, or IPL; Head-Turn Procedure, or HTP, see Golinkoff, Hirsh-Pasek, Cauley & Gordon, 1987; Hirsh-Pasek & Golinkoff, 1996; Jusczyk, 1997) have yielded much evidence that children may not be operating with item-based grammars for very long, if at all, and moreover are NOT extremely conservative when it comes to making grammatical generalizations.

I will cite three types of evidence, gleaned from studies of children's language comprehension in the domain of verb argument structure, to demonstrate these points. First, children are not necessarily extremely hesitant about extending their grammars beyond the input given. This evidence comes from studies of toddlers' verb-frame productivity, which I have conducted with Edith Bavin & Melissa Smith (Naigles & Bavin, 2001; Naigles, Bavin & Smith, 2002; Smith, Naigles, Bavin & Wagner, 2002). We taught the children two novel verbs, both in the transitive frame, during face-to-face interaction, and then asked the children to distinguish those verbs, in the transitive, intransitive, and neutral frames, via IPL. For example, we taught the children that *I am* (or *you are*) *kradding the ball* referred to one of two distinct actions involving a nerf ball and a seesaw. Then we presented the same actions on side-by-side monitors, and asked the children to find where 'She is kradding the ball', 'The ball is kradding' and 'kradding' (i.e. the audio conditions were presented within subjects). The dependent variable was the children's visual fixation to the matching screen. Children aged both 1;9 and 2;3 successfully matched the verbs to their actions, both when they were presented in the transitive (attested) frame, and when they were presented in the intransitive (unattested) frame. Crucially, neither group was successful when the verbs were presented in the neutral frame, thus indicating that they had learned – and were now processing – the verb in its frame, rather than simply extracting the verb and ignoring its surroundings. In sum, these children demonstrated that after only 16 presentations of a verb in its frame, they were more than ready to generalize, and extend that verb to a new (and appropriate) frame. This evidence for early grammatical productivity in comprehension seems to be at odds with MacWhinney's proposed conservatism (for relevant evidence in preverbal children, see Gomez & Gerken, 1999; Marcus, Vijayan, Bandi Rao & Vishton, 1999, and the more detailed discussion in Naigles, 2002).

Second, young two-year-old children (2;0–2;6) have already accomplished the generation of productive patterns (i.e. sentence frames) that are well-linked with verb semantics. These patterns are powerful enough to support the procedure of verb learning called SYNTACTIC BOOTSTRAPPING (Landau & Gleitman, 1985; Gleitman, 1990; Gillette, Gleitman, Gleitman & Lederer, 1999). A number of studies from different laboratories, all using the IPL paradigm, have demonstrated that toddlers' conjectures about the meanings

(i.e. action referents) of novel verbs are direct functions of the frames in which the novel verbs are placed. Transitive frames, either with full or pronominal NPs, lead children to prefer causative or contacting meanings whereas intransitive frames, either with single or conjoined NP subjects, lead children to prefer non-causative or synchronous meanings (Naigles, 1990, 1996, 1998; Naigles & Kako, 1993; Hirsh-Pasek, Golinkoff & Naigles, 1996; Bavin & Growcott, 1999; Kidd, Bavin & Rhodes, 2001; Fisher, 2002). A theory in which children place 'relatively more reliance on episodic/rote support, discounting the influences of analogic [i.e. pattern-generating] pressure' (p. 28) would seem to be hard-pressed to explain how these children arrived at – and used – these strong frame-meaning correspondences so early in their language development.

The third kind of evidence is related to the second; however, it comes from children's behaviour with attested verbs rather than novel ones. Overgeneralizations with attested verbs (e.g. *don't fall that on me*, Bowerman, 1974) are based on the same frame-meaning correspondences that children (and adults) use in syntactic bootstrapping. Rather than investigate when children would produce overgeneralizations, my collaborators and I asked how they would UNDERSTAND them (Naigles, Fowler & Helm, 1992, 1995; Naigles, Gleitman & Gleitman, 1993). We asked children (aged 2;0 to 12;0) and adults to act out sentences in which intransitive verbs were presented in (ungrammatical) transitive frames (e.g. A: 'The zebra goes the lion') and transitive verbs were presented in (ungrammatical) intransitive frames (e.g. B: 'The zebra brings to Noah'). The findings from the adults were as one might expect: these mature language users knew the argument structures of these verbs and so repaired the sentences by adding post-verbal prepositions to A and post-verbal nouns to B. The findings from the younger children were different: they enacted A as if the zebra made the lion go (reversal enactments, with the lion making the zebra go, were vanishingly rare), and B as if the zebra went to Noah on its own.

Two points are of interest here: first, the children, especially those two-to four-years of age, accepted these unattested sentences with little hesitation (their latencies for enacting the ungrammatical sentences were indistinguishable from those for the grammatical sentences; adult and older children's latencies were longer for the former than for the latter). Second and more importantly, their enactments 'fit' the demands of the presented frames (i.e. causative meanings for transitive frames) rather than the presented verbs (i.e. noncausative for *come* and *go*). Once again, these findings provide evidence that young language learners have generalized a frame or pattern which they readily apply to interpret novel instances (in this case, previously unattested forms of *come*, *go*, *bring*, *take*, *fall*, etc.). Moreover, our single presentation of *go* in the transitive frame apparently overrode, at least temporarily, numerous previously heard instances of intransitive

go (note as well that the semantic features of *go* are not in line with those associated with the transitive frame). These findings demonstrate that, for young children, the semantic implications of the generalized frame can be more salient than those of the individual verb; these tendencies are reversed in older children and adults. Finally, these findings are not unique to English; they have recently been replicated and extended in French (Naigles & Lehrer, 2002) and Kannada (Lidz, Gleitman & Gleitman, 2003).

In sum, according to MacWhinney's proposal, analogic (frame- or pattern-generating) processes operate later rather than earlier in language development and are given the weaker role; item-based conservatism dominates early in language acquisition. In MacWhinney's theory, such conservatism replaces, to some extent, the innate properties originally proposed to constrain children's generalizations. However, recent studies of children's language comprehension demonstrate that generalized frames are operating quite early – and powerfully – in language development. Furthermore, productive grammatical patterns can be observed in the comprehension performance of children under 2;0. This evidence indicates that item-based conservatism cannot be such a dominating force in early child language, and thus casts doubt upon item-based conservatism's ability to function as a replacement for innate grammatical properties. Solutions to the logical problem of language acquisition may indeed draw from multiple sources; however, they also need to be able to explain multiple kinds of data relevant to children's early linguistic knowledge.

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