The development of abstract syntax: Evidence from structural priming and the lexical boost

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We investigated the development of syntactic structures by comparing structural priming effects in young children, older children and adults. This developmental approach allows us to address three questions; 1) Are children’s early syntactic representations lexically-based or abstract from the start; 2) How do these representations change with development, and 3) How do we integrate accounts of syntax development with accounts of adult syntactic processing?

In structural priming studies, participants are presented with a prime sentence then asked to produce a target sentence. Participants who are primed show a significant tendency to re-use the structure they have just heard, even when prime and target share no lexical items (Bock, 1986). Priming effects are magnified when there is verb overlap (Hartsuiker, et al., 2008) but the existence of priming without overlap suggests that priming involves abstract syntactic structures (Bencini & Valian, 2008). In the present study, we investigated the development of syntactic structures by asking:

1. When do children show abstract priming effects; does the size of this effect change with development?
2. What is the effect of adding verb overlap between prime and target; does this effect change with development?

We adapted Branigan, Pickering & Cleland’s (2000) dialogue task (figure 1); sixty young children (mean age 3;8), 61 older children (mean age 5;8) and 62 adults were primed with double object datives (Wendy gave Boots a dog) and prepositional datives (Wendy gave a dog to Boots). One target response was elicited per prime using a stem completion technique. Half the participants had the same verb in prime and target (e.g. gave-gave) and half had a different verb (e.g. sent-gave).

All age groups showed a similar, small but significant priming effect when prime and target shared no lexical items (different verb condition), providing evidence that even 3-year-olds show abstract priming effects (figure 2). There was no evidence for developmental change, even when data from the youngest children (3;0 to 3;6) were analysed separately or when data from the children who never produced a double object dative were excluded from the analysis.

The additional priming provided by verb overlap increased with development, contrary to what we would predict if children’s early representations were built around verbs (Tomasello, 1992). Verb overlap (same verb condition) caused a large, significant increase in the priming effect in adults, but only a small (non-significant) effect in children.
These results; a) support the idea that abstract syntactic knowledge can develop independently of verb-specific frames (Fisher, 2001), and b) support the idea that different mechanisms are needed to explain lexical priming and abstract structural priming (Chang, Dell & Bock, 2006). They also demonstrate the need to integrate acquisition and adult processing mechanisms. Implicit learning theories (Bock & Griffin, 2000; Chang, et al., 2006) already argue for common mechanism supporting syntactic adaptation in acquisition and adult processing. However, they do not model lexical overlap effects, so cannot explain why these change over development. Activation models of priming (Pickering & Branigan, 1998) can explain lexical overlap but will need to be combined with Lexicalist (e.g. Tomasello, 2000) or Early abstraction (e.g. Fisher, 2001) accounts of acquisition to make developmental predictions.