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DISCUSSION

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Grammatical competence is not a psychologically valid construct

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It is not unusual for developmental psychologists to become frustrated with the theory of universal grammar (UG), whose proponents have tended to dismiss most research on children's language production and comprehension as irrelevant to explaining how human languages are acquired. This is because children's actual linguistic behaviour is presumed to reflect factors besides their grammatical competence, rendering most methods of sampling linguistic behaviour unsuitable for evaluating UG theory. This means, in practice, that UG proponents do not view performance errors as evidence against their hypothesis that grammatical knowledge is largely innate. When children perform at ceiling on a given task, this is usually taken as proof of their adultlike grammatical competence, while poor performance is dismissed as due to research design flaws or limitations in information processing capacities (e.g. working memory). Crain & Thornton (1998) attempt to eliminate what they consider to be *post hoc* processing accounts of children's linguistic behaviour by arguing, counter to Chomsky (1965) and many others, that children and adults share identical language processing mechanisms, and that linguistic performance directly reflects grammatical competence. Therefore, if UG principles are available from an early age, child and adult performance should be the same when tasks are properly constructed to avoid extra-linguistic demand characteristics (excepting adult–child differences predicted by parameter-setting or maturational models). It should not be surprising then that some psycholinguists, such as Drozd (target article), would find C&T to be misguided with respect to these issues, because children's linguistic behaviour surely differs from adults' in seemingly unpredictable ways. Much is at stake here, namely the defensibility of UG theory itself.

The problem here is that the performance/competence distinction has outlived its usefulness, if it was ever beneficial to the field. Child language researchers need to be concerned with characterizing and explaining the

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development of language performance, in all its context-dependent glory, and should do away entirely with the notion of grammatical competence. Speaking, listening, reading, and writing all invoke unique computational demands, and thus require individuals to generate and make use of linguistic representations in different ways. Semantic memory for linguistic information is flexible, probabilistic, and graded in strength and explicitness (Landauer & Dumais, 1997; Redington & Chater, 1997). Long-term semantic memory representations change with exposure to and use of linguistic constructions in communicative events (Seidenberg & MacDonald, 1999). This dynamic characterization of long-term memory for language is in marked contrast to the static view that grammatical competence is innate and mostly unchanging as a function of experience (Crain, 1991). There are genuine developmental differences, as well as crosslinguistic and individual differences, in the content of the semantic memory representations underlying linguistic behaviour (Stanovich & Cunningham, 1993; Bowerman & Levinson, 2001).

Language comprehension is not a matter of mapping sentences onto preexisting meanings. Comprehension is an inductive inferential process (Hilton, 1995) by which a listener attempts to work out a speaker's communicative intentions based on available cues, which might include contextual, lexical, syntactic, and prosodic information, as well as episodic and semantic knowledge (e.g. generalized event representations). Listeners opt for plausible interpretations of utterances that are consistent with whichever cues they happen to have chosen to process (MacWhinney & Bates, 1989). Linguistic knowledge represented in long-term memory plays a critical role in promoting certain interpretations over others, with the content of this knowledge varying as a function of experience with linguistic and social conventions. Importantly, listeners routinely make use of incomplete and possibly contradictory sets of cues to meaning, leading to their constructing interpretations of utterances that may differ from the intentions of the speaker (MacDonald, Perlmutter & Seidenberg, 1994; Clark, 1997; Keysar & Henly, 2001). Listeners can never be sure that they have gotten the intended meaning of an utterance exactly right, but given their sophisticated social cognitive and mind reading abilities, they can quickly pick up on whether they are on the right track. In evaluating speakers' communicative intentions, listeners 'satisfice' (Simon, 1996), by settling on sensible interpretations of utterances in context using whatever linguistic and extra-linguistic cues are readily available. Listeners do not tax their limited information processing capacities by conducting exhaustive syntactic analyses of incoming sentences, but rather make use of probabilistic heuristics in generating reasonable guesses. When individuals perform at ceiling on a task, it just means that the cues are reliable enough for practically everyone to converge upon the same inference.

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More interesting are the cases where individual judgements vary, which is the most common outcome reported in developmentally oriented research. For example, it has been demonstrated repeatedly (e.g. Philip, 1995; Brooks & Braine, 1996) that children and adults make different interpretative judgements with respect to universal quantification (such as rejecting a picture with extra elephants when asked *Is every boy riding an elephant?* in the case where every boy is indeed riding an elephant). C&T are absolutely right that pragmatic considerations are crucial in designing experimental tasks for children and they have done an admirable job of creating contexts for elicitation and comprehension questions that motivate children to engage in careful consideration of what the experimenter is asking of them. An important question is to determine what specific features of their tasks enhance children's understanding of the experimenter's intentions. C&T's condition of plausible dissent appears to be neither necessary, nor sufficient, to ensure 'correct' performance (Drozd & van Loosbroek, in press). Any experimental manipulation that increases children's awareness of the fact that linguistic expressions support multiple interpretations is likely to improve their performance. Children often may be unaware that the 'correct' interpretation is different from the one they entertain, and they may fail to revise their interpretations, even when faced with conflicting syntax (Trueswell, Sekerina, Hill & Logrip, 1999). Children may simply be less flexible than adults in considering how variation in the form of an utterance relates to its intended meaning.

Accepting the overwhelming evidence that language performance, in speaking, listening, reading and writing, develops does not negate the view that there are biological bases for language learning, or universal representational formats for semantic memory (Braine, 1994). Constraining hypotheses about innateness requires that we determine what children can actually learn about language, including what sentences and interpretations are unconventional, from the extraordinarily richly structured cultural and linguistic environments in which they are immersed.

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