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DISCUSSION

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What accounts for children non-adultlike linguistic behaviour?

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Drodz in his review of Crain & Thornton's Investigations in Universal Grammar (IUG) raises a number of important issues which, I think, deserve further discussion. In what follows I will concentrate on two aspects that might be the source of children's non-adultlike linguistic behaviour, namely memory and methodological weaknesses in experimental work. I will briefly comment on the use of statistics.

Crain & Thornton (1998) in IUG assume that, IN THE ABSENCE OF EVIDENCE TO THE CONTRARY, adults and children have the same processing capacity and memory limitations. This seems to be a fairly reasonable assumption in a developmental research strategy, as it forces researchers to posit differences only when it is necessary and after having excluded other possible sources of variation. However, this assumption may sound too strong, as it is evident that children's production and comprehension deviate from those of adults. What is the cause of the difference? Memory and processing limitations or performance factors are often advocated as the basis of the non-adultlike linguistic behaviour. However, a detailed account concerning how memory and processing interact with language acquisition is not on the market. Let us consider memory limitations, for example. We use memory in all verbal activities whether reading, speaking or listening. Therefore, any activity we do is influenced by our memory capacity and it is no surprise that memory may influence children's comprehension and production of language. Given some model of memory or another, what we would be eager to know, from the point of view of acquisition, is the specific roles that the various components of the memory system play in children's use of language (see e.g. Gathercole & Baddley, 1989) and more specifically in the processing of certain grammatical devices (garden path, ambiguity, embedding). This issue is taken up by Crain & Thornton who assume that verbal memory has two components: phonological working memory and the control mechanism. Phonological working memory holds some limited quantity of unstructured linguistic material for a brief period; the linguistic input is then recoded into a more durable form and transferred by the

control mechanism to the different levels of linguistic representation (phonological, syntactic, semantic) within the language-processing system. Whether it is reasonable or not, this conception of verbal memory sets a framework for investigating language acquisition. At first sight, it may appear counterintuitive to assume that the verbal memory system of children and adults share the same structures and capacities. However, it may not be structure that changes, but, for example, the speed of processing or the efficiency of inhibitory processes (Case, Kurland & Goldberg, 1982) or some factor that subserves memory. Various hypotheses are still wide-open.

Let us consider another source of non-adultlike performance. It is no news that children's non-adultlike responses in linguistic tasks are sometimes due to experimental artifacts. Consider number conservation, the ability to see that the number of elements remains identical when the same elements are arranged differently. Piaget concluded that children did not conserve number. This conclusion was based on an experimental artifact that has to do with the rules that govern language use, as discussed in Dehaene (1997). In the classical Piagetian experiment, children were asked the same question twice – before and after the manipulation of two rows with an identical number of marbles. Since a normal grown-up does not pose the same question for a second time, if she has already received a satisfactory answer, children were led to think that, on the second occasion, the adult's question had a different interpretation than on the first occasion: it should not be about numerosity, but about length. Therefore, they answered that the two rows were not the same (number)! Another instructive study which shows how careful one must be in interpreting children's behavioural responses is discussed in Gergely, Bekkering & Király (2002) (see also Meltzoff, 1995). Children at 1;2 do not imitate blindly an action to achieve the same goal, but do so only if they consider it to be the most rational alternative to achieve a given goal within the constraints of the actor's situation. They imitate an adult who illuminates a light-box with her forehead when the actor has her hands occupied much more than when the actor has the hands free (and in this case they prefer to touch the lamp with their hands). Why? Children are rational beings: when the actor has her hands free, it is more rational to touch the lamp with the hands than with the head. This study, as the previous one on number conservation, shows that we sometimes credit children with abilities or lack thereof on the basis of an experimental situation that fails to take into account the surrounding context, be it the conversational context or the context in which goal-directed actions are carried out. Failures of this kind are recurrent in studies on children's behaviour and are the basis for claims of children's poor competence in mathematics, language and so on (see also Politzer, 1986). Various cases of experimental artifact of the kind discussed

above are presented in Crain & Thornton's book, one being the case of children's behaviour with relative clauses. Children may not always perform as adults do, not because they have a different grammar, but because some features of the context force them to interpret sentences in an unexpected, but sensible way. These facts, as do children's failure to conserve number in the classical Piagetian experiment, are revealing of some weakness in children's competence, but perhaps not the intended one (not numerical competence nor grammatical ability). Over the years, Crain & Thornton have spent a lot of energy in finding out optimal conditions for eliciting a linguistic behaviour not influenced by extraneous factors. Whether they have succeeded or not is an open question, but their call for an effort of imagination in experimental work is without doubt an important message of their work. It is an invitation to pay attention to methods since these may introduce noise.

As a final point, I want to comment on one possible consequence of this care for methods that bears on how the data gathered should be analysed. To the extent that one can eliminate spurious factors from experimental work (it may not be possible), variability between subjects should be small and, if the given competence is available, performance should be very high or very low (if the competence is not available). If there is no dispersion in data, it is impossible to use any statistics and this is the dream of every researcher (not only of Crain & Thornton). In any event, even when there is dispersion in data, one has to first inspect the data visually and then decide whether or not statistical analysis is needed and which one. For example, in many articles ANOVA is employed. Its results are generally very reliable even if the requirements of normality of distribution and of uniformity of their variance are not respected. This is fine. Unfortunately, it turns out that distributions are sometimes bimodal, but this information is lost if one employs the ANOVA (see Chierchia, Crain, Guasti, Gualmini & Meroni, 2001). A graph of the distribution or a table would, in this case, be more informative.

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