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# DISCUSSION

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## Commentary on *Learnability and linguistic performance* by Kenneth F. Drozd*

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In this commentary I will take up the topic of the Crain & Thornton's (C&T) Modularity Matching Model vs. the approach C&T dub the Competing Factors Model, arguing that there is reason to adopt a model that includes elements of both those approaches, as I understand them.

### *The models as presented by C&T, and an alternative*

Figure 1 reproduces the Modularity Matching Model as presented by C&T (their Figure 4.1, p. 31); Figure 2 reproduces the Competing Factors Model (their Figure 4.2, p. 33). Figure 1 clearly espouses modularity, with syntactic principles feeding semantic/pragmatic principles, which form a linguistic module separate but connected to real-world knowledge. Figure 2, the Competing Factors Model shows linguistic knowledge, real world knowledge, and attention and memory interacting, with no implication (other perhaps than the size of the pie slices) that any one of these will have priority over another or how and when they interact. Figure 3 presents a model of the language processing system proposed by Goodluck (1990). The model is broadly based on Forster (1979), who argued for a modular approach in which initial stages of lexical and syntactic analysis take place in a manner impervious to world knowledge. Although such a strong version of modularity is the subject of much ongoing debate, I believe that the general picture proposed is defensible (see, for example, Frazier, 1999 and Jackendoff, 2000).

The models in Figures 1–3 share elements of the same approach. In my 1990 paper I proposed that children and adults have a processing device of the same general structure, but that children's processing capacity is more limited, and that 'efficiency in performing operations at a given level may be dependent on the point at which the particular operations are scheduled' (p. 370). Thus the model in Figure 3 has both properties of Modularity

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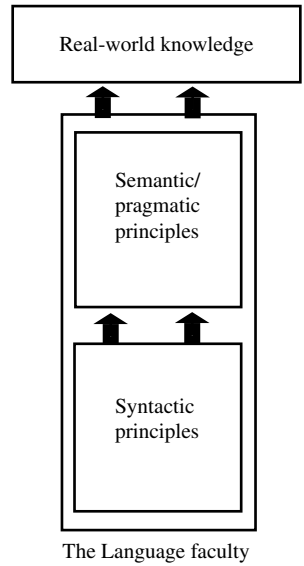



Fig. 1. The Modularity Matching Model.

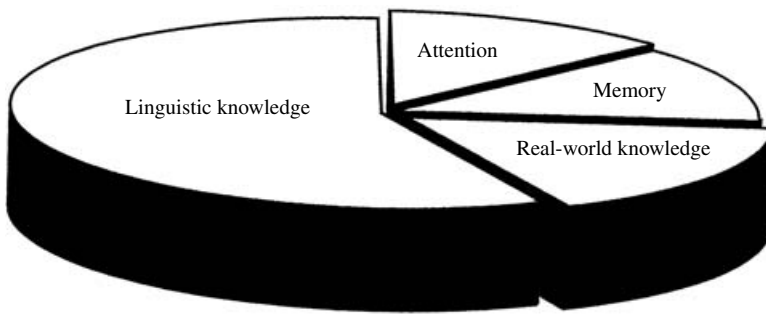



Fig. 2. The Competing Factors Model.

Matching (modularity, ordering of operations and shared architecture of the processor) and of Competing Factors (limited processing capacity on the part of the child).

The structure of the model in Figure 3 and the assumption of limited processing capacity do not in my opinion open a 'Pandora's box of possible explanations for children's linguistic performance' (Drodz, quoting C&T, p. 30). Rather, a processing model with enough structure articulated, plus the assumption of limited processing capacity, can make predictions that potentially inform our understanding of the human language capacity in



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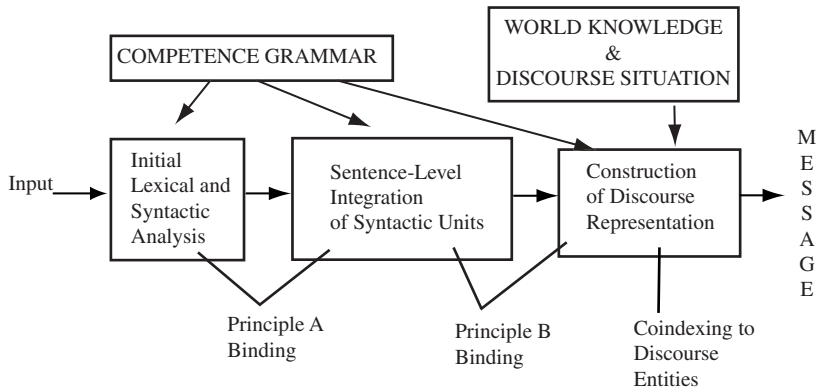



Fig. 3. Model of the language processing system proposed by Goodluck (1990).

general. The model in Figure 3 predicts that discourse-related operations will be performed less well by children than those scheduled towards the beginning of the processing chain. Put another way, sentence-internal operations would be more efficiently performed than those requiring sentence-external information. One example that I gave in support of this prediction was the Principle B lag. The fact that children do better in interpreting reflexive pronouns than in interpreting definite pronouns could be put down to the fact that definite pronouns require more input – more syntactic structure and/or use of discourse and context. The processing of definite pronouns hence may have to take place at a later stage in processing (as indicated in Figure 3), when resources are more limited.

A lot of research on children's command of Principles A and B has taken place since 1990, and I do not wish to claim that all asymmetries in performance on the Binding Theory can be accounted for in processing terms (although I agree with Grodzinsky & Reinhart (1993) that it's a tack worth pursuing). However, I still firmly hold to the view that children are relatively inept at discourse-related operations and the use of context in sentence interpretation. For similar views and/or evidence concerning a range of syntactic phenomena, see, for example, Avrutin (1999, 2000) on direct questions, Goodluck, Terzi & Chocano Díaz (2001) on PRO/pro constructions, and Trueswell, Sekerina, Hill & Logrip (1999) on PP modifiers.

*Resolving an apparent conflict*

The claim that children lack skill in integrating discourse-related and contextual information in understanding sentences is potentially at odds with the claim that '[a] central theme of C&T's experimental programme … is to



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identify and fulfill the felicity conditions that lead to adultlike performance by children under experimental conditions' (Drodz, section headed 'Experimental Design and Techniques'). Fulfilling such felicity conditions often entails sensitivity to context. Drodz cites 'C & colleagues' well-known success at improving children's performance with relative clauses by fulfilling their presuppositions in context (e.g. Hamburger & Crain, 1982)'. Using an act-out task, Hamburger & Crain claimed performance on interpreting restrictive relatives improved when a number of animals was provided to chose the head from, as opposed to only one, meeting the requirement that a relative clause picks out a member of a set. However, Hamburger & Crain's claims concerning children's sensitivity to felicity conditions on relative clause use have been challenged on several grounds – see Goodluck (1990), O'Grady (1997) and Eisenberg (2002). For example, Eisenberg did not replicate Hamburger & Crain's finding when a between-subject design (rather than a comparison between different experiments in the literature) was used. In view of these studies, the case of relative clause interpretation does not provide support for the view that children are sensitive to the match between pragmatic constraints and context.

*Why model 3 is worth pursuing*

The work of Crain and his colleagues has done much to build the case for the child's command of a highly structured syntactic system from an early age. However, my own (retrospectively naïve) perspective by the early 1980s was that the battle to demonstrate that children had knowledge of the principles of universal grammar was largely won, and that much of the real meat of work in acquisition was going to be in understanding the interface between universal grammar and processing. (As an example of the early establishment of children's use of syntactic structure, Solan (1983), although often cited as arguing for a linearly based restriction on pronominal reference in early grammars, in fact argued for children's knowledge of the binding principles and children's use of a branching structure definition of c-command; Goodluck & Solan (2000) is a replication and extension of some of the basic contrasts Solan tested in his 1983 work). It is of course of vital importance to establish what the child's grammatical rules are, but given that children do have a highly articulated, structurally based system, that is only one of the reasons for studying child language. For example, a model such as that in Figure 3, and the assumption of limited processing capacity on the part of children, potentially allows us to see where the fault lines of the human language faculty lie – i.e. in a processor of limited capacity we have the opportunity to see the modules isolated, as illustrated by children's greater ease with purely syntactic phenomena than with syntax/discourse integration.



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*Conclusion*

Early on in my training I was taught the importance of thinking big, and to be prepared to leave the odd detail unaccounted for (for the time being). I recall my discussions in the late 70s with my fellow graduate students Larry Solan and Susan Tavakolian often having a flavour of 'the wood, Helen, the wood!'. And so I am very sympathetic with C&T's desire to take a strong stand, but as for Modularity Matching, I feel it's time to say 'the trees, C&T, the trees!'.

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