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DISCUSSION

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Grammar, processing and acquisition

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Drozd notes that Crain & Thornton's view of children's processing capacities (namely that they are the same as those of adults) is inconsistent both with the more widely held view that there are at least quantitative differences between the performance systems of children and adults, and with what is known about the acquisition of many grammatical phenomena. There is, I believe, an additional consideration that must be brought to bear here: there are highly suggestive parallels among children acquiring their first language, adults acquiring a second language, and Broca's (agrammatic) aphasics with respect to the comprehension of patterns that involve comparatively heavy demands on the processor. These parallels not only seem to confirm that children's processing resources are initially compromised, they point to the possibility of a greater role for processing in understanding grammatical development.

Relative clauses are a case in point. It is commonly reported that due to the shorter distance between the gap and the head with which it is associated, subject relative clauses such as (1) are more easily understood by children than are direct object relative clauses such as (2) (see O'Grady 1997: 179 for a review).

(1) The truck [that _ bumped the car]
(2) The truck [that the car bumped _]

Interestingly, the same result has been reported for second language learners (e.g. Hamilton, 1994 and the references cited there) and for aphasics (e.g. Grodzinsky, 1989).

Parallel asymmetries have been noted for other phenomena. For instance, reflexive pronouns (with their structurally prominent, local antecedents) are easier to interpret than are plain pronouns, and *to*-datives (with their canonical V NP PP order) are easier to comprehend than are double object datives. See O'Grady (2002*b*, 2003) for a review.

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TABLE 1. *Some parallels in language acquisition and language loss*

Phenomenon	Relative difficulty, if a deficit occurs
Relative clauses	direct object relatives > subject relatives
Pronoun interpretation	plain pronouns > reflexive
Datives	double object datives > prepositional datives

How can these parallels be explained?

One idea, popular among neurologists, is that syntactic deficits in aphasia result from the disruption of working memory – the pool of operational resources that supports the computations involved in forming and interpreting sentences. For instance, Caplan & Waters (1999) attribute syntactic deficits to the loss of computational space, as do Just & Carpenter (1992); see also Just, Carpenter & Keller (1996) and Dick, Bates, Wulfeck, Gernsbacher, Utman & Dronkers (2001). Indeed, it is frequently observed that the lesion sites associated with receptive agrammatism overlap with the regions supporting working memory – e.g. Hickok (2000) and Stowe (2000); see Smith & Jonides (1997) for a review. The resulting shortage in computational space, it is suggested, underlies the difficulty of structures that make relatively greater demands on processing resources (e.g. direct object relatives vs. subject relatives, plain pronouns vs. reflexive pronouns, and double object datives vs. prepositional datives).

Then what are we to make of the fact that parallel contrasts show up in the course of first language acquisition (and second language learning)? Surely, it makes sense to attribute them as well to an (initial) shortage of processing resources in comparison to those available to normal adults.

Space does not permit a thorough discussion of where this might lead, but I will put forward a suggestion that is developed in detail in O'Grady (2002*a*, to appear): contrary to what both Drozd and Crain & Thornton assume, a simple, efficiency-driven processor – not Universal Grammar – lies at the heart of the language faculty. The effects of this processor can be seen both in the form that languages take (the design of sentence structure, constraints on co-reference, and so forth) and in the facts of development, with earlier mastery of structures that make lighter demands on working memory (e.g. subject relative clause vs. object relatives).

On this view, then, processing and working memory have a very central role to play in understanding language learnability and development, contra both the Modularity Matching model adopted by Crain & Thornton and more widely held views on the role of UG that are not questioned in Drozd's review.

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