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USING CHILDES TO STUDY LANGUAGE DISORDERS

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The six articles in this special issue develop two common themes. The first is a focus on natural processes involved in spontaneous interactions between children with language disorders and their caretakers. The second is the reliance on a common set of analytic tools for studying these interactions. These common tools are provided by the transcription and analysis procedures developed by the Child Language Data Exchange System (CHILDES). Over the last few years, the CHILDES system (MacWhinney, 1991) has become a central methodological tool in the study of normal child language development. There is now a very large computerized database of transcripts from normally-developing children, as well as a large body of studies that have used this database to test substantive hypotheses in the theory of language acquisition. The six articles contained in this special issue show that the system can also be used effectively to advance our understanding of issues in the study of developmental language disabilities.

By providing a wide range of analytic tools for studying phonological, morphosyntactic, lexical, interactional, and narrative structures, the CHILDES approach tends, in practice, to emphasize the interactive complexity of naturalistic data. Some students of language disorders have hoped to shortcut some of this complexity by locating some pivotal language ability that could serve as a unique diagnostic for specific types of impairment. For example, analyses of children with Specific Language Impairment (SLI) have placed emphasis on auditory limitations (Tallal, 1976), pragmatic limitations (Craig, 1991), morphosyntactic limitations (Leonard, McGregor, and Allen, 1992), and even linkage to a dominant gene for grammatical feature blindness (Gopnik and Crago, 1990). However, there are two good reasons to be skeptical about claims regarding simple linkages between genotypes and phenotypes.

First, we know that, even the most uniform genotype has massive variation in its actual expression. Chromosomal disorders such as Williams

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Syndrome, Down Syndrome, and Fragile-X Syndrome display a wide variation in their cognitive and linguistic sequelae. Disorders such as autism, SLI, or general mental retardation have an even more complex clinical picture.

The second factor that should lead us to be skeptical regarding simple phenotype-genotype linkages is the complexity of language itself. The relation of language to the underlying neural substrate is one of complex interdependence of overlapping distributed systems, including major parts of nearly half of the cerebral cortex. Although there are some workers in psycholinguistics who have emphasized the modular composition of linguistic systems (Ferreira and Clifton, 1986; Fodor, 1983; Swinney, 1979), the type of processing being investigated in these accounts is certainly not "impenetrable" across relatively long time periods and more encompassing processes in communication. If one looks at linguistic decisions that extend over a period of a second and beyond, researchers generally agree that auditory, lexical, syntactic, and grammatical processing is constructive and interactive. Most of the high-level processes going on in naturalistic interactions involve decisions and planning occurring in this longer, more interactive time frame.

If we take naturalistic interactions as our starting point for the study of language disorders, we must be prepared to study a system that cannot be easily decomposed into modules and pieces. If, for example, a child has problems achieving rapid access of lexical items during sentence production, the youngster can learn to cope with these problems by relying on pauses, fillers, and interactional markers that buy time for other linguistic processes. Although the resulting speech may have some disfluencies, it may be difficult to detect the direct impact of the timing disorder on the use of specific grammatical or lexical structures. Those disabilities that affect non-pivotal information processing skills can be overcome through compensatory strategies. Over time, the child may acquire better and better ways of dealing with these types of underlying processing limitations.

Because of the adaptive nature of the child's system, we cannot rely on naturalistic interactions as arenas for detecting the immediate effects of underlying processing deficits. This fact indicates the importance of coupling studies based on naturalistic samples with studies directly assessing underlying psycholinguistic abilities. A combination of these two methodologies can allow us to link the content validity of naturalistic analyses with the empirical power of experimental designs. However, even the linkage of these two powerful methodologies is not enough to guarantee that we will be able to produce simple accounts for all types of language disorders. This is because there is reason to believe that at least some language disorders may be broad-based and pervasive, rather than modular and specific.

The research reported in these six articles suggests two dimensions along which instances of language impairment may vary. These are the dimensions of "centrality" and "severity". In children with relatively central deficits, we

may find a general language delay with no specific psycholinguistic "smoking gun". In other cases, we may find experimental evidence for specific peripheral impairments of the type currently being discussed in the literature. Similarly, we may expect to find some children whose language disabilities are marginal and transitory and others whose impairments are permanent and profound.

It makes good sense to focus first on the dimension of overall severity. One can make a major cut between children with transient language problems and children with more permanent language problems. Children suffering from accidental or non-systemic injuries seem to have the best prognosis for the development of normal or near normal language. Hemmer and Ratner's report demonstrates the robustness of language development against the degradation of auditory input that occurs during otitis media (OM). Children suffering from this transient condition show no permanent language delay when compared with their sibling controls. Similarly, the children with periventricular leukomalacia (PVL) studied in the article by Feldman, Janosky, Scher, and Wareham and in the article by Hemphill, Feldman, Camp, Griffin, Miranda, and Wolf also demonstrate a marked resilience of the language processing system against early brain trauma. In the cases of OM and PVL, we are watching the recovery of a genetically normal system from a particular trauma. It is difficult to believe that the PVL children have incurred no damage to their basic language system. But what is important is that the construction of that system was so resilient in its design that they were able to recover virtually normal functioning.

On the other hand, the Down Syndrome children studied by Tingley, Gleason, and Hooshyar and the SLI children studied by Rollins, Pan, Conti-Ramsden, and Snow evidence a more general language deficit, both in the area of basic indicators such as MLU and in the area of specific narrative skills. In none of the groups studied here do we see children with some particular limitation in a single linguistic module. Instead, what we see is either overall recovery or overall deficit.

The picture that arises from this type of high-level severity analysis of free speech corpora needs then, to be matched against data gathered from at least two other major methodologies. First, we need to study the performance of these same children in detailed experimental studies of word recognition, comprehension, lexical access, and other basic psycholinguistic tasks. Second, we need to explore the abilities of these children to acquire new lexical, pragmatic, and morphosyntactic structures over time (Keefe, Feldman, and Holland, 1989; Leonard et al., 1979). Together, a use of CHILDES methodology for the study of spontaneous productions, experimental methodology for the study of basic psycholinguistic variables, and longitudinal methodology for the study of the acquisition of new structures can give us a full and faithful picture of the developmental time course of children's abilities to cope with language disorders.

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