

The Dual Mechanism Model

Abstract: The Dual Mechanism Model credits the Brain/Mind with having two fundamentally different cognitive modes of language processing--this dual mechanism has recently been reported as reflecting inherent qualitative distinctions found between (i) regular verb inflectional morphology (where rule-based stem+affixes form a large contingency), and (ii) irregular verb constructions (where full lexical forms seem to be stored as associative chunks). One potential syntactic proposal (below) would be to examine the Dual Mechanism Model and broaden its scope to covering the overall grammatical development of Child First Language Acquisition.

It has recently been hypothesized that the language faculty consists of a dualistic modular structure made up of two basic components: (i) a *Lexical component*--which has to do with formulating lexical entries (words), and a (ii) *Computational component*--which is structured along the lines of algorithmic logic (in a Chomskyan sense of being able to generate a rule-based grammar). It is argued that these two very different modes of language processing reflect the 'low-scope' (1st order) vs. 'high-scope' (2nd order) dichotomy that all natural languages share. Low/High scope would be described here in terms of how and where certain aspects of language get processed in the brain. In addition to newly enhanced fMRI brain imaging devices, multidisciplinary data (e.g. linguistic, psychological, biological, neurological) are starting to trickle in providing evidence that a dual mechanism is at work in processing language. Results of experiments indicate that only a dual mechanism can account for distinct processing differences found amongst the formulations of irregular inflected words (e.g., *go>went, foot>feet*) and regular inflected words (e.g., *stop>stopped, hand>hands*). The former (lexical) process seems to generate its structure in terms of stored memory and is taken from out of the mental lexicon itself in mere associative means: these measures are roughly akin to earlier Behaviorist ideas on frequency learning, etc. fashionable in the 1940s-60s and made notable by the experimental work of Donald Hebb and B.F. Skinner. The latter regular mode of generating structure is tethered to a Chomskyan paradigm of (regular) rule-driven grammar--the more creative, productive aspect of language/grammar generation. Such regular rules can be expressed as [Stem]+[affix] representations, whereby a stem constitutes any variable word <X> that must fit within the proper categorization (part-of-speech) stem. Regular rules for Past Tense [+Past] and Number [+Pl] would be spelled-out respectively:

e.g., [Verb <x> + {ed} => Past Tense],

[Noun <x> + {s} => Plural].

Proposal: The general aim of a syntactic proposal (labeled herein as ‘The Converging Theories Hypothesis’) is based upon hybrid theories, proposals stemming from recent investigations in the areas of PDP-style connectionism, as well as from more naturalistic studies, and sample-based corpora of Child Language Acquisition. Much of what is sketched out in the proposal attempts to converge the leading tenets of two major schools-of-thought--namely, Associative Frequency learning and/*vs.* Symbolic Rule learning. The main task of the proposal is (*i*) to broaden and extent the dual mechanism account--taking it from the current slate of morphology to the larger syntactic level, and (*ii*) to spawn some theoretical discussion of how such a dual treatment might have further implications behind more general developmental aspects of language acquisition (as a whole), namely, (though not exclusively), the twin benchmarks of syntactic development regarding Lexical/principle *vs.* Functional/parameter (staged) grammar, etc. The central claim will be that whatever factors lead to a deficient morphology, say at a given Stage-1 of development--factors that may potentially lead to the postulation of a non-rule based account--these same factors are likely to be carried over, becoming a factor of deficiency in the overarching syntax. Thus the tone of the discussion is dualistic throughout. The main goal is two-prong: first, to assert as the leading null hypothesis that language acquisition is *Discontinuous* in nature from that of the adult target grammar, and that this discontinuity is tethered to maturational factors which lay deep seeded in the brain--factors which yield fundamental differences in the actual processing of linguistic material, (a so called ‘Fundamental Difference Hypothesis’), and second, to show that this early multi-word non-target stage can be attributed to the first leg of this dual mechanism--i.e., that side of cognition/language processing that governs (*i*) (quasi-) formulaic structures along with (*ii*) non-parameterizations. We attribute the generation of this two-stage development to maturational scheduling--namely, a Non-INFLectional Stage-1 and/*vs.* an OPTional Stage-2 (where formal grammatical relations are first learned in a lexical ‘bottom-up’ fashion and then later regroup to generalize across the board in a word class ‘top-down’ fashion). It is our understanding that the two-stage development involves and shares both relevant associative style theory of learning (associative learning, stage-1) while preserving the best of what syntactic rule-driven theories have to offer (rule-driven grammar, stage-2)--hence, the term ‘*Converging Theories*’. By analyzing much of what is in the literature today regarding child language acquisition, as well as drawing from the rich body of work presently being undertaken in connectionism, it is our hope that a new hybrid converging theory of child language acquisition can be presented in a way that captures what is inherently good from both schools--an alternative theory that bears more flavor of truth than camp rhetoric.