

# Road ahead in teaching language to the needy

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Research shows that in child language learning, the acquisition of words and their associative meanings (e.g., armchair means furniture and comfort) are predominantly linked to the declarative memory system, which is an associative learning mechanism capable of learning through instructions. Grammar (e.g., inflecting words as per 'rules', i.e., I like vs She like-s), on the other hand, is predominantly acquired by the procedural memory system which possesses a complex statistical learning mechanism that is capable of tracking the regularities in the input over time (exposure). Children with language impairment (LI), who are otherwise known to be normal in every other aspect of development, have pronounced deficits in acquiring grammar, but not in word learning. Consequently, their procedural learning has been compromised in comparison to their declarative learning. Most language teaching methods for children with LI are instruction based which will enable grammar rules to be memorized in their declarative system rather than their procedural memory system. Although this may seem like a good solution for children with LI, this article will explore in-depth the downfalls of this method and alternative initiatives in light of these downfalls.

Past literature has shown that by using explicit instructions, grammar relations can be taught efficiently. However, a closer look at the method shows that these studies have mostly involved teaching of grammatical events relations that has high probability of co-occurrence (i.e., easily memorizable). For instance, Finestack and Fay (2009) examined the ability of LI children to learn the gender inflection through instructions. The LI children were instructed to mark 'pa' or 'pu' with the verb for 'male' and 'female' subjects respectively, which they learned efficiently. In our view, these LI kids simply memorized the rule that was given to them simply because memory functions through the declarative system. However, grammar relations in natural language are much more complex. For instance, the frame, 'I want to go running' could have many variations of 'want' such as 'I want(1)/wanted(2)/ have been wanting(3)/ had been wanting(4)/ will be wanting(5) to go running' (all legitimate) making the allowable transitional probabilities (TP) (TP is probability of 'B' given 'A') between variations of 'want' and other elements very low (*running* or *I* / variations of 'want' is  $1/5=0.2$ ) in this context. In comparison to the probability relations examined by the studies by Finestack and Fay which have a high TP (*male / pa* is  $1/1=1$ ), the low TPs described in natural language could be extremely procedural and it is possible that even a highly flexible and intact declarative system would fail to learn such rela-

tions. It must be noted however, that the traditional instructional method is not completely inapplicable and it has worked under some circumstances. Alternative language intervention methods have yet to emerge as a viable replacement.

In light of the challenges posed above, research examining the possibility of recruiting the alternative default learning mechanism (i.e., procedural system) for grammar learning in children with LI is strongly recommended. Lum and his colleagues (2014) meta-analyzed studies that examined procedural memory in LI participants and reported that procedural learning is not all lost in LI children. That is, they still have the wiring to learn the probability relations (like grammar events) by exposure. However, what is not clear is, whether or not it is the capacity or the efficiency of the procedural system that is limited in LI. If the former is true, LI children may never possess the ability to acquire complex grammar (like the 'want' example) relations and if the latter is true they will be able to learn complex grammar structures with repeated exposure. Initiatives should be made in understanding the learning strengths of LI children so smooth transition to training methods can be made.