

## **Patterns of motion expression in children with or without a language disorder**

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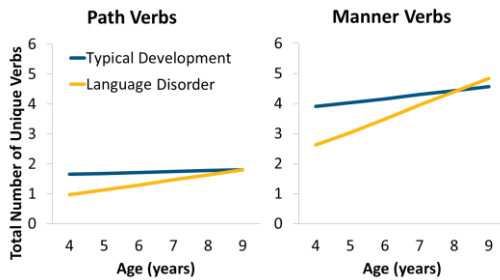
Children with language disorders (LD) have smaller vocabularies with shallower semantic knowledge [1] and more difficulty mastering some grammatical markings [2] than their typically developing (TD) peers. Recent evidence suggests that these deficits may stem from an impaired ability to extract distributional statistics from sequenced stimuli [3]. We asked whether children with LD are sensitive to the distributional patterns of expression in their native language. For example, while it is grammatical to say “He is walking” or “He enters the room,” English speakers tend to conflate the two motion components in a single utterance by saying “He walks into the room,” using one among a diverse array of manner verbs (“run”, “fly”, “crawl”) tightly packaged with a path particle/preposition (“up”, “across”, “to” [4]). Despite having more semantic elements than separated packaging—in which only manner or path is encoded—by the age of 3, English-speaking TD children produce a greater number of conflated motion utterances than children who are speakers of languages that typically use separated packaging with a smaller variety of manner verbs to describe similar motion events (French, Turkish; [5-6]). Such cross-linguistic findings suggest that the use of the conflated motion packaging does not simply reflect a developmental trajectory toward using more complex expressions but, instead, reflects a sensitivity to the distribution of semantic information (rate of production for conflated vs. separated constructions) in adult language. In this preregistered study, we asked whether children with LD attune their descriptions of motion events to language-specific patterns akin to TD children. We predicted that if children with LD were sensitive to distributions of motion information in English, they would show similar rates of expression as TD children or would show lower rates of use if they were not.

We examined narratives in the Edmonton Narrative Norms Instrument Database [7] produced by 4- to 9-year-old English-speaking children with LD ( $n=77$ ; enrolled in services) and age- and gender-matched TD peers ( $n=77$ ; teacher report). Children described six scenes in a picture book and the two groups produced narratives that were comparable in length. Each expression of a motion event was coded for verb vocabulary type (manner verbs, path verbs) and packaging type as conflated (manner and path in a single utterance) or separated (manner or path in separate utterances) following earlier work [6]; utterance grammaticality was not considered. Data were analyzed with mixed effects models. Results showed age  $\times$  diagnosis interactions for both verb and packaging: Children with LD produced a smaller variety of manner and path verbs and fewer conflated and separated descriptions than their TD peers, but only at the younger ages. Furthermore, our results showed a sex  $\times$  diagnosis interaction suggesting that, boys—but not girls—with LD were 2.5 times less likely to use conflated packaging for motion descriptions than TD children.

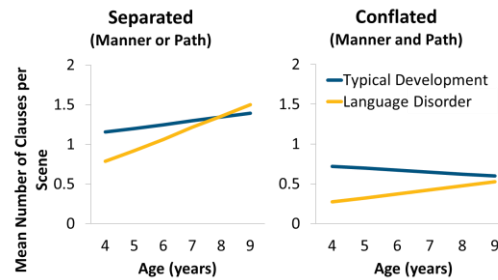
Our results showed both weaknesses and strengths in children with LD in attuning to language-specific patterns in their expression of motion. In line with past research [1], children with LD had smaller motion vocabularies than TD children but only at the earlier ages; however, as the vocabulary of the children with LD caught up to their TD peers, so did their rates of use for each of the motion packaging types. This indicates that children with LD were in fact sensitive to the distribution of motion expression types in English, a result that mirrors earlier findings suggesting that the use of certain verb types can drive the use of associated syntactic constructions [8]. At the same time, boys—but not girls—with LD were less likely to conflate motion when describing a motion event, consistent with previous findings showing a female advantage for language abilities in both individuals with LD or TD [1,9]. Overall, our findings demonstrate that children with LD attune their patterns of expression to the distributional properties of motion expression in their language—once they have acquired the prerequisite vocabulary. However, matching such distributions may be more challenging for boys than girls.

## Figures

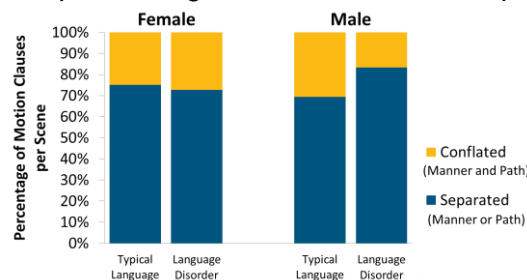
(1) Are there group differences in children's production of motion vocabulary?



(2) Are there group differences in children's production of motion packaging?



(3) Are there group and sex differences in the likelihood of a motion description being conflated in children's production?



## References

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