

# Considering visual processing for investigating typical and atypical signed language development

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## Abstract

There has been considerable debate in the spoken language literature concerning the causes of developmental language disorders. By one account, a signal-based factor (i.e., the speed of the auditory signal) causes challenges for hearing children who struggle with processing rapidly presented stimuli (see Tallal & Benasich, 2002, for a review). Because signed languages are perceived by the eyes rather than the ears (save tactile sign language), the exploration of a signal processing account would need to concern itself with aspects of the visual signal and the visual-spatial characteristics of signed languages. Such an approach could allow for comparisons across language modalities.

Signed and spoken languages differ considerably with respect to the signal that is used for communication. The visual signal travels much more rapidly through space than the auditory signal does, and the extent of communicative information that is available simultaneously using vision (e.g., via a signer's multiple articulators) is greater than what is available through audition. These modality differences could influence some aspects of language processing such as short-term (sequential) memory (Boutla, Supalla, Newport, & Bavelier, 2004). However, signed language users must process much information simultaneously, and it has been shown that multiple articulators (manual and non-manual) encourage a highly simultaneous structure. These structural differences likely impact some of the language disorders that one might find in children acquiring a sign language.

One focal area of inquiry with respect to simultaneously realized linguistic structure concerns the use of the multifunctional signing space (e.g., for grammatical, diagrammatical, and discourse purposes). This is an area of signed language structure that could be used to consider differences across modalities with respect to development. For example, comprehension and memory tasks for classifiers involve processing linguistic information (e.g., classifier handshapes) and perspective-taking computations (e.g., considering the signer's viewpoint vs. others'), and development requires the refinement of both types of skills over time, even throughout adolescence. Deficits in visual-spatial skills could present challenges for children acquiring signed languages. I will present an approach to investigating development that places a focus on visual-spatial processing. This area of inquiry allows us to consider ways in which language modality could influence patterns of development and (a)typicality.

## References

1. Boutla, M., Supalla, T., Newport, E.L., & Bavelier, D. 2004. Short-term memory span: Insights from sign language. *Nature Neuroscience*, 7, 997-1002.
2. Tallal, P., & Benasich, A.A. 2002. Developmental language learning impairments. *Development and Psychopathology*, 14. 559-579.

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