

Receptive vocabulary knowledge in individuals with autism as assessed by eye movements, pupillary dilation, and event-related potentials

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Introduction: An important question about nonverbal individuals with autism is whether their lack of expressive ability is necessarily accompanied by an equally severe deficit in receptive language. Little research has addressed this question, both because of the difficulty of testing low-functioning participants, and because of the insensitivity of most behavioral methodologies. We have used eye movements (EMs), pupillary dilation (PD), and event-related potentials (ERPs) as measures of receptive vocabulary knowledge in individuals in whom self-report and behavioral accuracy served as measures of comparison. Here, we describe the use of these same measures to assess receptive vocabulary knowledge in low-functioning individuals with autism.

Methods: Participants included three low-verbal or nonverbal males (15-21 years old) diagnosed with autism. Caregivers completed checklists that were used to determine stimuli that were expected to be known receptively by the participants; unknown stimuli were drawn from a pool of items developed for other subject populations. Participants completed two tasks: during the *forced choice recognition* task (EM and PD data), four pictures were presented on a computer screen, along with an auditory token that named one of the pictured objects. During the *congruity task* (ERPs), single pictures were presented on the computer screen, accompanied by an auditory token that did or did not match the name of the pictured item. Participants were not required to make behavioral responses for either task.

Results: EMs were faster for known words, and end-of-trial fixations were on the named picture more frequently for known words than unknown words. PD from baseline was greater in the unknown condition. An N400 congruency effect was observed for known words, but not for unknown words.

Conclusions: EMs, PD, and ERPs differentiated known from unknown words, suggesting that these may be valid measures of single-word comprehension in otherwise “nonverbal,” nonresponding, low-functioning individuals with autism.

