Assessing language in girls with Rett syndrome: An eye tracking study

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Introduction

- Girls with Rett syndrome (RTT) have severe limitations in hand use and are unable to communicate.
- Attempts to assess their language abilities through behavioral observation have proved inconclusive (Didden et al., 2010).
- Intense eye gaze is one of the most important ways girls with RTT relate to the world (Von Tetzchner, 1997).
- Behavioral observation has proved inconclusive with conflicting results (Baptista et al., 2006; de Velloso, 2006)

This experiment was modeled two paradigms to study language comprehension and processing in infants and young children:

- The preferential looking paradigm (Golinkoff et al., 1987) - Given two pictures and the auditory instruction to look at one of them, fixations to the named (i.e., target) picture will be greater than to the distracter.
- The looking while listening paradigm (Fernald et al., 1987) - Given two pictures and the auditory instruction to look at one of them, fixations to the target picture will be greater than to the distracter.

Hypotheses:

- The language processing of girls with RTT will be similar to younger TD children and older girls with RTT similar to older TD children.
- The performance of younger girls with RTT will be similar to younger TD children and older girls will RTT similar to older TD children.
- Differences were found between the age groups; school age girls displayed preferential looking similar to 19 to 26-month-old TD children, although it took them longer to do so; preschool girls shifted their attention much later.

Methods

Participents

- RTT age group: Preschool, School age, Adolescent
- TD age group: Younger, Older
- N: Preschool 7, School age 7, Adolescent 3, TD younger 6, TD older 6
- Gender: Male/Female
- Age range: Preschool 1.7–5.7 years, School age 6.0–12.7 years, Adolescent 13.9–18.10 years, TD younger 2M, 5F, TD older 6M, 3F
- Mean age (SD): Preschool 3.10 (±1.3), School age 8.55 (±2.32), Adolescent 16.00 (±2.1), TD younger 12.17 (±2.1), TD older 19.26 (±2.6)

Stimuli

- Same animate objects (bird-cat and dog-baby) and inanimate objects (shoe-ball and car-book) paired together.
- Pictures only presented first, followed by the auditory instruction “Where’s the dog? Look at the dog!”

Timeline

- Pictures only
- “Where’s the dog?”
- “Look at the dog!”

Results

- Data analysis was accomplished through a customized MATLAB (The MathWorks Inc., 2013) program.

- The differences may be related to the course of RTT; between 12 and 36 months, girls typically undergo a period of regression followed by stabilization.
- Attention difficulties also interfered with task performance.
- Thus, girls with Rett syndrome have greater language abilities than have been previously demonstrated; eye tracking has the potential to increase our understanding of the potential of this population.

Conclusion

- Language comprehension and processing of girls with RTT resembled that of TD infants and young children.
- Differences were found between the age groups; school age girls displayed preferential looking similar to 19 to 26-month-old TD children, although it took them longer to do so; preschool girls shifted their attention much later.

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