RAISE: RURAL AUTISM INDIVIDUALS - SUPPORTING EXPRESSION

Improving language comprehension via gestures in rural Montana children with language impairment and/or autism

INFORMATION FOR CLINICIANS

Our Team (expertise):
Sarah Pennington, Ph.D. (dyslexia, education, and eye tracking)
Nadya Modyanova, Ph.D. (autism and language impairment in children)
Kalli Decker, Ph.D. (rural services and gestures)
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George Horowitz (Research Lab Manager); Gloria Baldevia (Undergraduate Researcher)

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Project summary: Our research will investigate how specific types of gestures can support receptive communication skills of hearing children with Language Impairments and/or Autism in rural communities. The study will use eye tracking methodology to understand relationships between successful understanding of determiners, such as “that”, and gestures such as “same”. The overarching goals of the project are to understand how individuals/families can effectively utilize gestures to support communication with their children. → (see the end of the document for longer project summary)

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Note about COVID-19: Our team requires that proper masks are worn by researchers for this project for all in-person interactions when social/physical distancing are not possible (6-foot distancing between individuals) (as per MSU’s Level 1 Research operations and MSU IRB Guidance). Prior to in-person visits, researchers and participants will be asked to complete a short screening for exposure to COVID-19 or symptoms of illness; appointments may be rescheduled in case of recent/current exposure or illness.

Characteristics of potential participants:
1. Confirmed diagnosis (preferably) or unofficial diagnosis of an autism spectrum disorder, or a receptive language impairment, or both. Other additional diagnoses are accepted.
2. Ages 4-18 preferred.
4. Normal hearing and vision (or vision corrected to normal with glasses or contacts).
5. Nonverbal IQ of 70 or above, and/or nonverbal mental age equivalent of 4 years or above, and/or the ability to play simple computer games on a laptop**, to look at picture books, and listen to sentences and words.
6. Native speakers of English (additional languages ok), able to speak in short sentences.
7. Caregivers and participants should live in a rural area. (Preferably: they have to commute to a clinic for the child’s speech-language services from a rural area (e.g., travel for ~ 30 minutes and/or ~ 30 miles to reach services)).

**The participants should be able to sit (relatively still) at a laptop computer, look at the screen, click on pictures on a screen with a mouse based on a verbal prompt, for ~10 minutes at a time. Children would get ample breaks. They should be able to keep their hands quiet.
Participant exclusion criteria:
1. Acquired brain disorders and/or poor hearing.
2. Nonverbal mental age below 4 years, or standard score below 70 on a nonverbal IQ measure.

Participant incentives:
1. The researchers from our team will visit participants in their rural homes at a time convenient for participants and their families for the assessments. Alternatively, participants and their caregivers are welcome to come our lab at Montana State University-Bozeman (parking at MSU campus will be paid for).
2. Participant will be provided with one $60 gift certificate to Amazon.com as a token of appreciation.
3. Participants and their caregivers will be provided with a summary of current state of the art regarding how using gestures can help with language comprehension, and with a report of participant’s scores which can then be shared with their healthcare provider as necessary.

Description of assessments (estimated time to complete is 2-3 hours, with additional breaks as needed):
A. For caregivers
   1) Social Communication Questionnaire (SCQ) to assess participant’s autism symptoms (social interaction, communicative domain, & repetitive behaviors).
   2) Children’s Communication Checklist (CCC-2) to assess participant’s language skills, especially pragmatic and social interaction skills.
   3) Our demographic/informational questionnaire – to assess socioeconomic status and verify diagnoses.
B. Standardized and established measures for participants
   1) Kaufmann Brief Intelligence Test (KBIT) to assess participants’ nonverbal IQ.
   3) Nonverbal Inhibition Hand-Fist Task/Luria’s Hand Game to test executive functioning.
   4) Children’s Test of Nonword Repetition (CNRep) to assess short-term phonological working memory.
   5) Test for Auditory Comprehension of Language (TACL) to assess receptive language/grammar.
   6) Peabody Picture Vocabulary Test (PPVT) to assess receptive vocabulary.
C. Experimental tasks
   1) Nonverbal False Belief task to test Theory of Mind skills (inferring about others’ points of view).
   2) Determiner and gesture comprehension tasks.
Participants will be audio recorded for all tasks, and their eyes will be video recorded during Experimental tasks.

Longer Project summary: Many hearing individuals with language impairments (Developmental Language Disorder, 7% of children) and/or autism spectrum disorder (ASD, 3% of children) experience persistent deficits in communication. Such difficulties can lead to less-than-optimal life outcomes and wellbeing, and reduced independence for ASD/DLD individuals. Interventions are possible for children with ASD/DLD, but when they are living in rural areas, such interventions are hard to reach, and few interventions can be done at home, thus increasing disparity in access to healthcare in rural children with ASD/DLD and their families. With all this in mind, the goal of the proposed study is to investigate how specific gestures support ASD/DLD children in rural Montana with comprehension of determiners like “the” and “an”, which are known to be difficult in ASD/DLD communication. Extant literature indicates gestures support comprehension and production of language for ASD/DLD; however, little is known about how spoken determiners and related gestures interact for these children. This study will utilize eye tracking and think-aloud protocols to gain insight into hearing children’s (both typical and with ASD/DLD) understanding of specific determines when they integrate with specific gestures. These methods will allow the researchers to determine the speed with which participants identify the correct item being referenced and gain insight into their thought process as they engage in the experimental tasks. The proposed study has two specific aims. The first is to determine the feasibility of doing this study in the participants’ homes. The second aim is to collect preliminary quantitative and qualitative data on how using certain gestures helps or hinders comprehension of certain determiners. The short-term outcome is to provide results of the study and existing research to caregivers in a timely manner – informing them of how caregiver gestures can help with their child’s language comprehension, which would be helpful for communication that supports their child’s language development. The significance of this work is in its potential to identify specific gestures that are supportive of ASD/DLD individuals’ comprehension of spoken language, which could be investigated in the future as part of randomized controlled trial of an intervention to help families communicate better with individuals with ASD/DLD. This project is innovative in that it utilizes eye tracking tools to gain a nuanced understanding of the degree to which specific gestures may be supportive of language comprehension in children with ASD/DLD.