Word recognition in infants at elevated likelihood for autism

(300 words)

To understand developmental processes occurring prior to autism diagnosis, researchers often study infant siblings of autistic children, who have a higher than average likelihood of receiving diagnoses of autism. We created the Remote Infant Studies of Early Learning (RISE) battery, which is designed for large samples and includes tasks assessing cognitive and language skills that are likely sources of heterogeneity in autism.

RISE's word recognition task is adapted from an in-person task with typically-developing infants [1]. Because online studies sometimes yield smaller effect sizes than in-person tasks [2], we aimed to pilot online administration with infants with and without autistic siblings.

The task was administered via Children Helping Science [3]. Infants viewed 20 trials, each presenting two images and audio targeting one (e.g., "Where is the bottle?") (Figure 1). We used iCatcher+ [4] to identify gaze direction. Participants are infants without an autistic sibling (6-month-olds, $n = 33$; 12-month-olds, $n = 36$) and infant siblings of autistic children (6- and 12-month-olds, each $n = 13$).

Linear mixed-effects models were fit for each age group and family group. Among infants without an autistic sibling, 12-month-olds but not 6-month-olds oriented significantly more to the target stimulus when it was the target than when it was the distracter (6-month-old target preference -0.02, 95%CI [-0.06, 0.01]; 12-month-old target preference 0.04, 95%CI [0.01, 0.08]). Among infants with an autistic sibling, there was no significant target preference in either group (6-month-old 0.06, 95%CI [-0.01, 0.14]; 12-month-old mean target preference 0.04, 95%CI [-0.02, 0.11]).

RISE appears to be a feasible method for remotely assessing language skills and can be completed by infants at lower and higher likelihood of receiving an autism diagnosis. Ongoing data collection may reveal more about different trends across groups.

References:

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2. Chuey, A., Boyce, V., Cao, A., & Frank, M. C. (2024). Conducting developmental research online vs. in-person: A meta-analysis. *Open Mind*, *8*, 795-808.
3. Scott, K., & Schulz, L. (2017). Lookit (part 1): A new online platform for developmental research. *Open Mind*, *1*(1), 4-14.
4. Erel, Y., Shannon, K. A., Chu, J., Scott, K., Kline Struhl, M., Cao, P., ... & Liu, S. (2023). iCatcher+: Robust and automated annotation of infants' and young children's gaze behavior from videos collected in laboratory, field, and online studies. *Advances in methods and practices in psychological science*, *6*(2), 25152459221147250.

Figure 1: *Frame capture from one representative trial targeting "foot" or "bottle".*

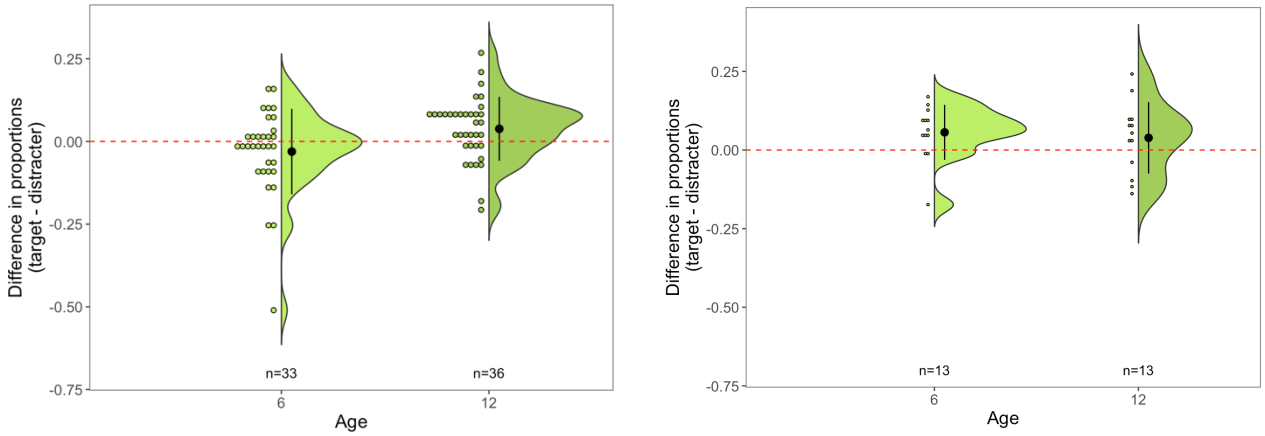

Figure 2: *Data from the infants without autistic siblings (top) and with autistic siblings (bottom). Preference for the target, calculated as the proportion of time looking at each image when it was the target subtracted by the proportion of time when it was the distracter.*