Rapid Online Assessment of Reading (ROAR): A platform for developmental cognitive neuroscience research at an unprecedented scale

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Background

- Developmental disorders manifest with heterogeneous phenotypes. Thus, it is critical to have a myriad of reliable measures that can characterize these phenotypes.
- Conventional measures are time consuming and resource intensive which decreases sample size and bias samples towards unrepresentative, well-resourced communities.
- We developed and validated the ROAR for deep phenotyping, the precise and comprehensive analysis of phenotypic variation, at an unprecedented scale.

Methods

- Administered to over 7,000 participants, aged 4-40, through school partnerships, community organizations, clinics, and research labs across the US.
- Assessments are hosted on the ROAR dashboard that supports common single sign-on systems (SSO) such as Clever and Google for easy administration and tracking of large groups of participants.

Results

Online, automated measures of reading are highly correlated with standardized, individually-administered measures (N=116).

Sentence Reading Efficiency data can reliably predict performance on the Test of Silent Reading Efficiency and Comprehension across a broad grade range (N = 1998).

Visual processing measures are moderately correlated with reading ability measures.

Discussion & Future Directions

- The ROAR platform overcomes the challenges of deep phenotyping by facilitating reliable and valid multidimensional data collection from large, representative samples.
- Based in community-based research, the ROAR is designed to be used in homes, schools, clinics, and laboratories.
- We aim to translate the platform and all assessments to other languages to best serve diverse populations.

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