



# Enhancing Language Comprehension in Neurodivergent Children of Rural Communities: A Multimodal Approach



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## Background

Neurodivergent children in rural communities often face challenges in language comprehension. Previous research underscores the importance of tailored interventions due to EEG abnormalities observed in neurodivergent children. However, accessibility barriers persist, particularly for non-verbal individuals in rural areas.

## Objective

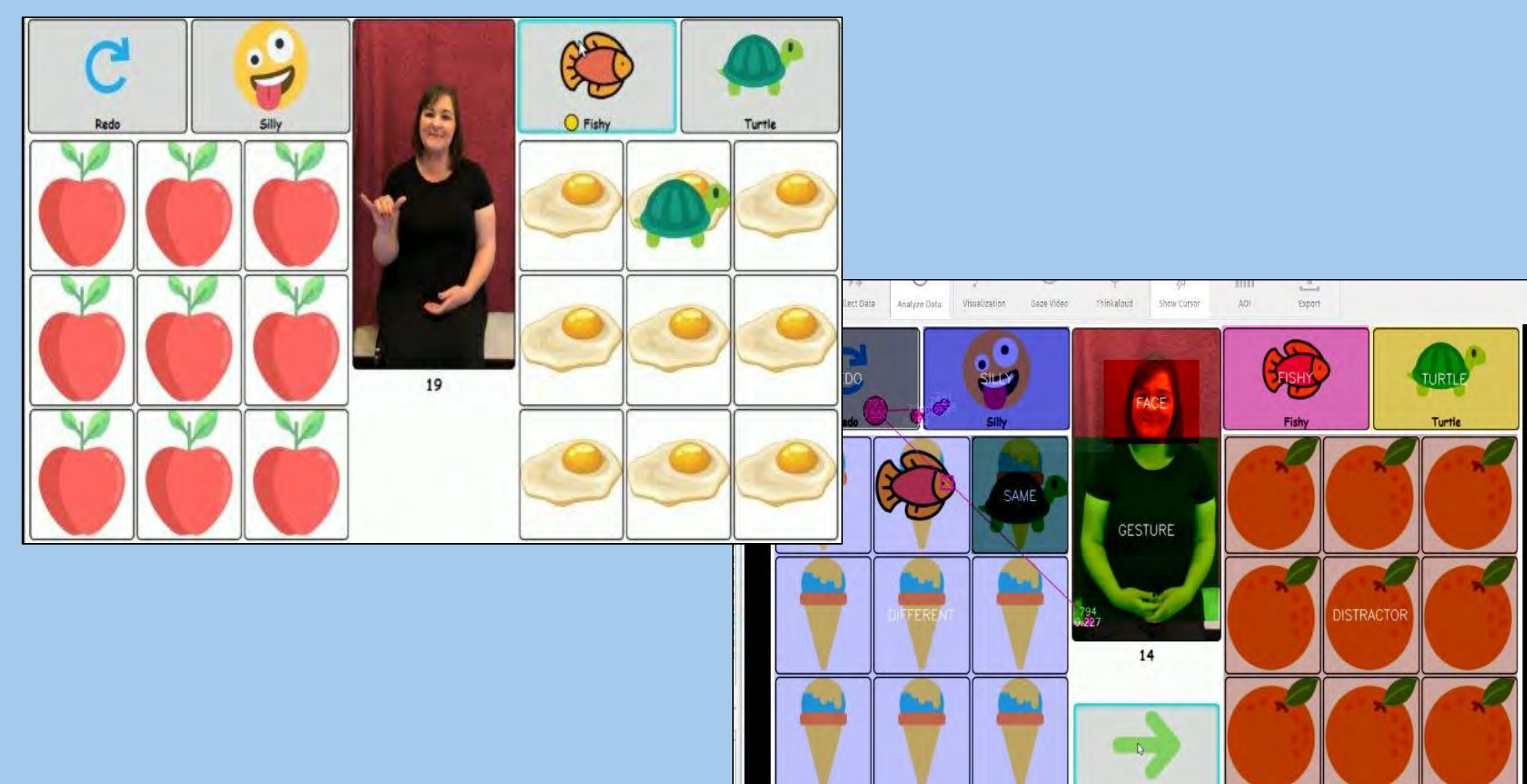
This study aims to investigate the efficacy of incorporating gestures to enhance language comprehension, specifically focusing on determiners, in neurodivergent children. Determiners: "the", "an", "that", "another", "same", "different". Determiners can take a while to develop in Typically Developing (TD) children (ages 3-8, without autism)

## Hypothesis

The study hypothesizes that integrating gestures and determiners will lead to improved comprehension, especially among children with ASD and younger typically developing children. Eye tracking will complement EEG data, allowing for the observation of gaze patterns and their correlation with cognitive and language skills.

## Methods

This research employs an inclusive approach involving non-verbal rural participants to offer a comprehensive understanding of language comprehension. Data collection involves EEG recordings, eye-tracking analysis, and assessment of language skills.



## Participants

Include neurodivergent children from rural communities, particularly those with ASD and DLD, as well as typically developing children.

- 35 Children, ranging in age from 2 to 17
- 11 Neurodivergent and 24 Neurotypical
- 3 Adults, ages 20 to 31, primarily Neurodivergent
- Group 1 = correct comprehension at T0.
- Group 0 = poor comprehension at T0.
- Group 9 = cannot complete task.

## Conclusions

The study underscores the positive impact of multimodal interventions on language comprehension and highlights the importance of tailored interventions for neurodivergent children. Collaborative efforts and innovative technologies enhance the study's robustness and potential for real-world application.

## Future Research

Future research aims to inform the development of tailored interventions for neurodivergent children in rural communities. EEG data will reveal semantic processing differences and abnormal brain wave patterns, potentially serving as biomarkers for ASD and DLD. Next steps are to record neural responses via EEG (electroencephalogram) and ERPs (event-related potentials) which can indicate presence or absence of sensory processing and/or semantic integration and processing.



## Results

