

Evaluating Feasibility of a Novel Emotion Regulation Paradigm to Elicit Strategies and Behaviors in Children with Neurodevelopmental Delay

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Background

- Disruptive mutations to the SETBP1 gene are associated with developmental delays, intellectual disability (ID), autism, motor apraxia of speech, ADHD and have reported difficulties with emotion regulation (1).
- There is limited biological evidence of emotion regulation in children with cognitive and communication challenges, including EEG.

Objective

- We sought to test a new EEG paradigm meant to cause minor frustration and regulatory behaviors that will measure emotion regulation.

Methods

- Paradigm and behavior coding manual was modified from Laboratory Temperament Assessment Battery (LAB-TAB) End of the Line Task and the Infant Still Face Paradigm (2).
 - Block 1: Toy awarded to child to play with (1 min.)
 - Block 2: Still face begins, toy withdrawn (1min.)
 - Block 3: Toy returned and play resumed (1 min.)
- Pilot study included 6 participants (ages 4-13 years) with SETBP1 mutations and developmental delay (Table 1)
- Videos double-coded in 5-second epochs for instances of interactive (e.g., attempting eye contact, requesting gesturing) and non-interactive (withdrawing, stimming, distracting self).

Participant Demographics

Participant	Sex	Age (years)	Language Impairment	Phase Speech	Autism	ADHD
Participant 1	M	13.74	Yes	Functional	Yes	No
Participant 2	M	4.12	Yes	Single Words	No	No
Participant 3	F	6.12	Yes	Some Phrases	No	No
Participant 4	M	6.57	Yes	Functional	No	No
Participant 5	M	7.98	Yes	Functional	NA	NA
Participant 6	M	9.95	No	Functional	Yes	Yes



Figure 1. Interactive and Non-Interactive Behaviors

- Each measured epoch has a mean of behaviors that were measured as interactive (attempting eye contact, requesting gesturing) or non-interactive (withdrawing, stimming, distracting self).
- Mixed effects ANOVA found a main effect of Block on total number of regulatory behaviors ($F(2,216)=21.45, p<.001$). Fischer's LSD PostHoc Tests showed differences between:
 - Block 1-Block 2 ($p=.1701$): not significant
 - Block 2-Block 3 ($p=2.3e-06$): significant
 - Block 1-Block 3 ($p=2.2e-09$): significant

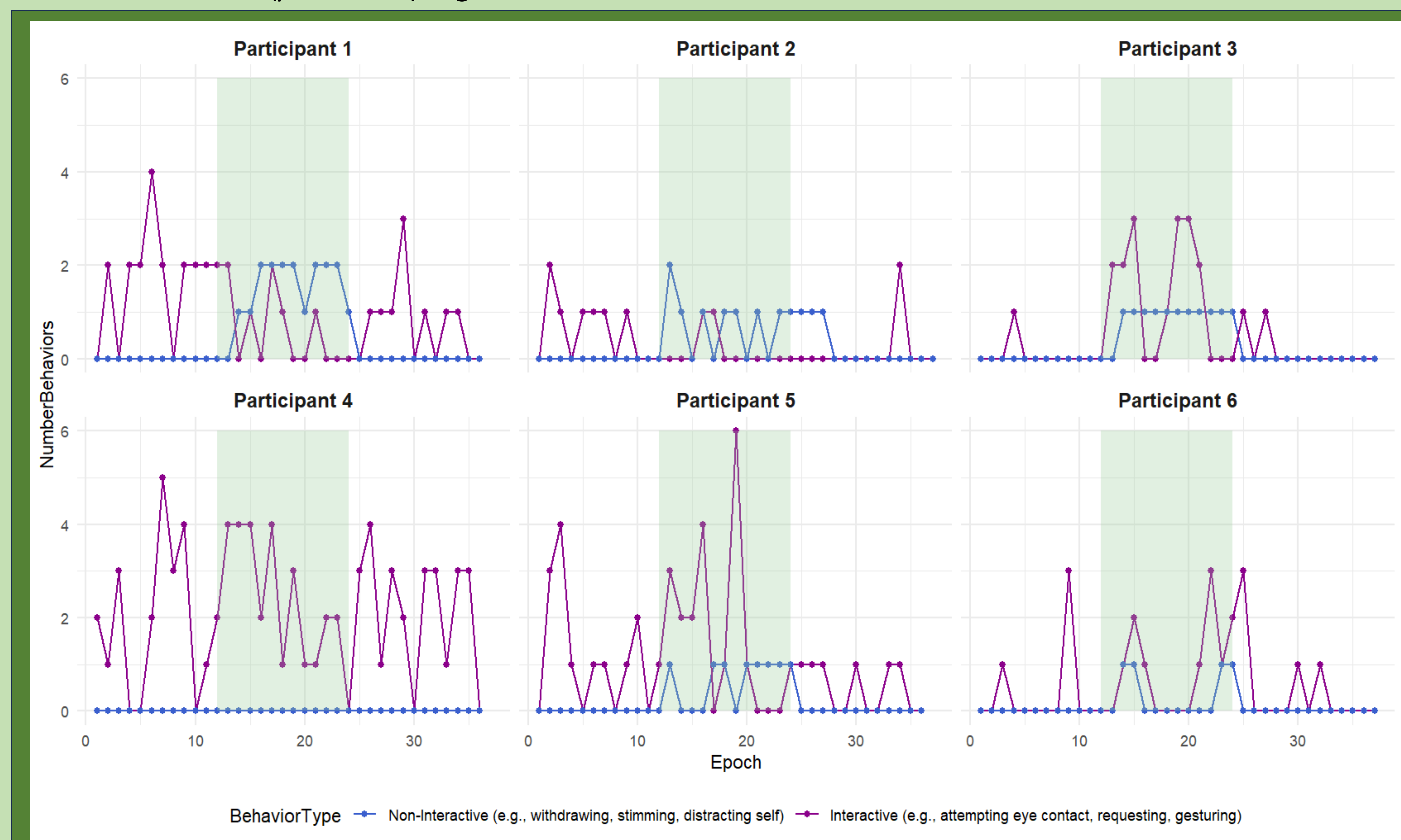


Figure 2. Regulatory behaviors of individual participants throughout the experiment.

Graph demonstrates 6 individual participants with the highlighted area demonstrating the block two where the toy was withdrawn from child. FISHER LSD postdoc test found differences between block 2 and 1 and 3 but no differences between 1 and 3

MAIN TAKEAWAY

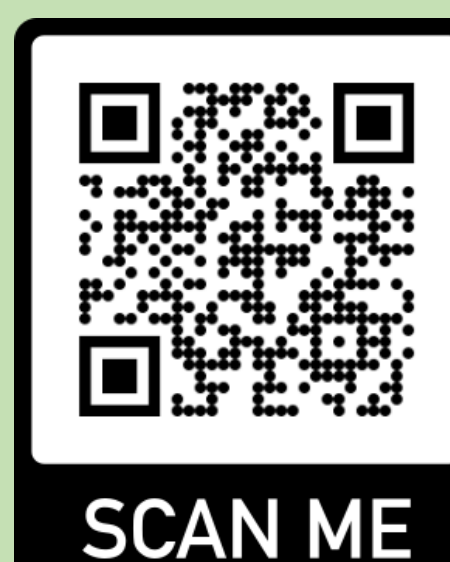
- This study was important to understand understudied populations with limited language abilities

- The novel emotion regulation task elicited more regulatory behaviors compared to baseline (block 1 and block 2).
- These results provide preliminary evidence for the validity and acceptability of this paradigm.
- We found increased behaviors during block 2 (toy withdrawal) compared to block 1 and 3 (play)
 - All participants were able to complete tasks regardless of cognitive and communication abilities

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