

# Electrophysiological effects from a pilot quasi-randomized controlled trial of the Social Detective and Superflex series curriculum in autistic youth

Kristin Walker<sup>1</sup>, Talena Day<sup>1</sup>, Allison S. Nahmias<sup>2</sup>, and Matthew D. Lerner<sup>2</sup>  
Stony Brook University<sup>1</sup> and Drexel University<sup>2</sup>

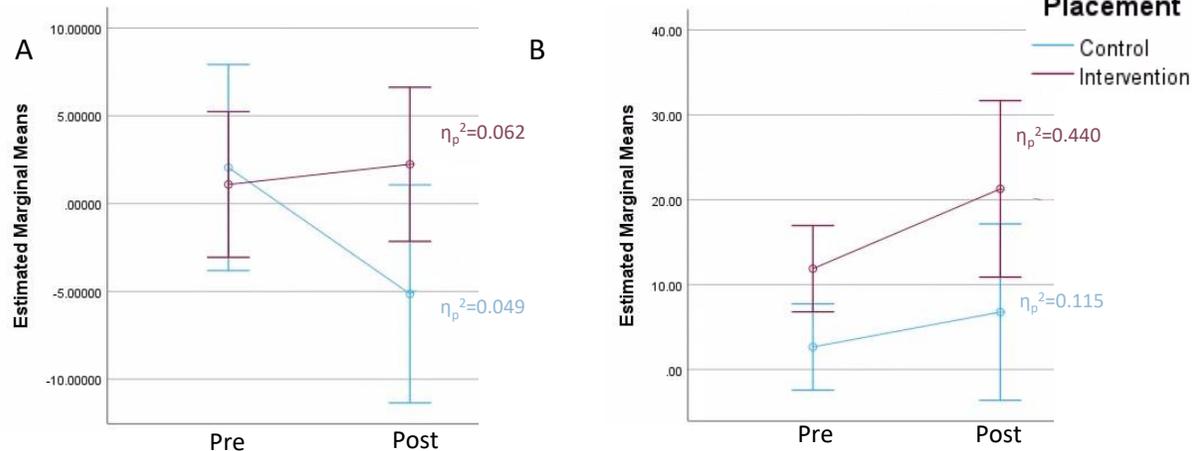
## INTRODUCTION

**Social difficulties** are an autistic trait (APA, 2013) that, if not addressed, can significantly affect interpersonal relationships, academic achievement, and psychological well-being (Silveira-Zaldivar et al., 2021). One social intervention is the Social Thinking Methodology's **Social Detective/Superflex (SD/S) curriculum series**. While this curriculum is widely disseminated across settings and is well-received by professionals (Yadlosky, 2012), independent empirical studies are needed to validate its efficacy (Crooke & Winner, 2016). **Electrophysiological indices can serve as biomarkers** capable of tracking SD/S treatment response before observable behavioral changes manifest.

**Objective:** Assess the efficacy of SD/S on electrophysiological indices of processing of social-emotional tasks among autistic youth in a laboratory setting.

**Hypotheses:** SD/S participation compared to the control condition would relate to a larger amplitude of Late Positive Complex (LPC), P3, and error-related negativity (ERN) and a faster latency of N170

**Figure 1.** Changes by group condition between pre and post times in (A) LPC and (B) P3. Error bars denote 95% confidence intervals.



## METHOD

**Participants:** 18 autistic children in grades 2-5 ( $M_{age}=8.44$  years old; 14 males;  $VIQ \geq 80$ ) participated in the 20-week SD/S ( $n=9$ ) or a matched control group ( $n=9$ ).

**Measures:** Electroencephalogram (EEG) recordings were collected during SELWeb tasks at pre, post, and follow-up time points. Event-Related Potentials extracted: **LPC (theory of mind), P3 (prosocial reasoning), ERN (performance fears), N170 (face processing)**

**Data Analysis:** repeated measure ANOVAs

## RESULTS

- While pre- to post-LPC amplitudes **decreased in the control group** ( $p=0.025$ ), they did **not differ in the SD/S group** ( $p=0.54$ ).
- P3** showed a **larger amplitude in the SD/S group** ( $p=0.05$ ), but **not in the control group** ( $p=0.34$ ) from pre to post times.
- ERN amplitudes** ( $ps > 0.07$ ) and **N170 latencies** ( $ps > 0.10$ ) **did not differ** across time or between groups.

## DISCUSSION

**LPC amplitude** (underlying construct: theory of mind) **decreased** in the control group only; the lack of decrease in the SD/S group **may indicate sustained attention during spontaneous theory of mind reasoning** (e.g., Meinhardt, 2011).

**P3 amplitude** (underlying construct: prosocial reasoning) **was larger** to prosocial behaviors in the SD/S group only, **suggesting more cognitive resources allocated to processing social information** (e.g., Loke et al., 2011).

Larger randomized controlled trials are needed to further validate these findings and assess the trajectory of these ERPs in relation to behavioral improvements.

SD/S participation was associated with an enhancement in neurocognitive processing underlying socioemotional abilities

