

# Differential and Shared Pathways to Sensory Over-Responsivity and Anxiety: The Role of Hot and Cool Self-Regulation

Elizabeth Glenn, Abiola Taiwo, Laura Lee McIntyre  
University of Oregon, Special Education and Clinical Sciences

## Background

- Anxiety and sensory over-responsivity are elevated in autism spectrum disorder (ASD), and developmental delay (DD) compared to the general population
- Sensory over-responsivity (SOR) may contribute to the development of anxiety, and have shared top-down and bottom-up mechanisms
- Self-regulation (SR) is one mechanism that may explain shared top-down regulatory processes, and is amenable to intervention
- SR has been conceptualized as “hot” and “cool”, depending on emotional qualities

## Methods

- N = 94 children, 6-14 yrs, history of ASD or DD
  - ASD status = school, community, or ADOS
  - IQ = WASI @ Time 1
- Measures:**
- Time 1 and Time 2, collected ~1 year apart
  - Clinical anxiety: > 1SD on CBCL DSM anxiety scale (dichotomized due to non-normality)
  - “Hot” SR: BRIEF emotional control
  - “Cool” SR: BRIEF inhibit + shift subscales
  - Sensory Over-Responsivity: Short Sensory Profile (SSP), avoidance, sensitivity subscales

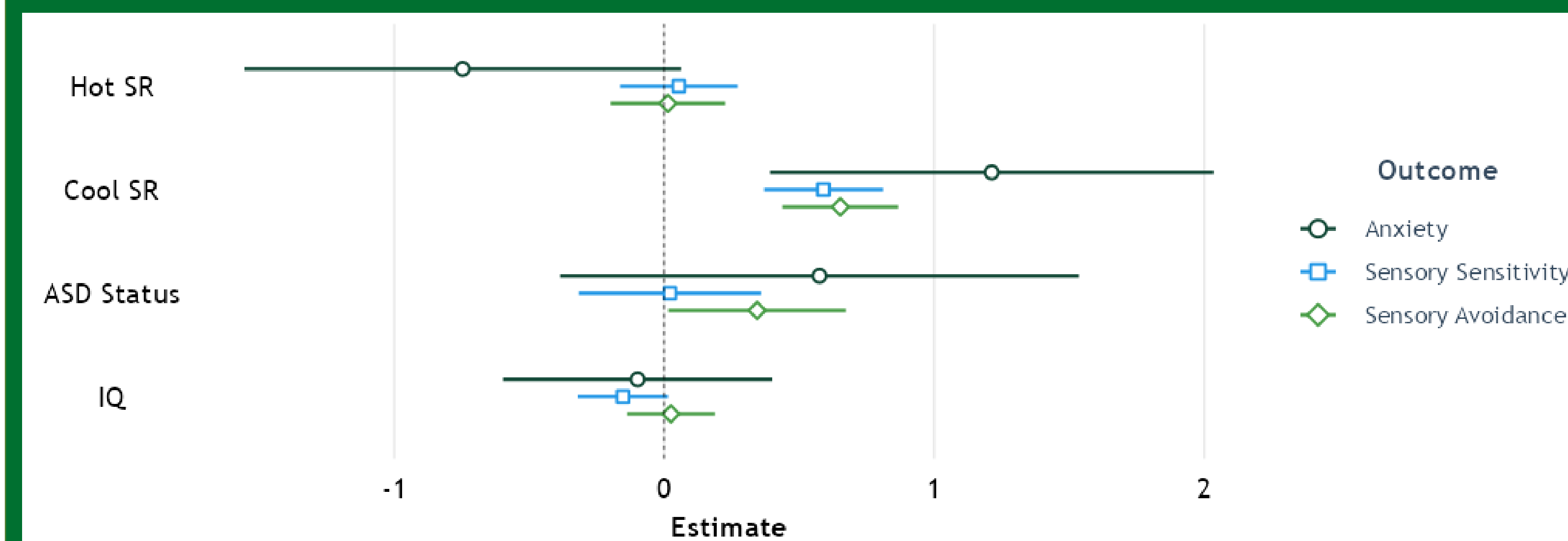
Demographics	
Mean Age (SD)	9.24 years (1.91)
Male	76%
Hispanic/Latino	17%
Non-White	25%
Parent Age (SD)	39.38 (6.42)
Parent Years Education (SD)	15.49 (2.78)
Income 30K+	74%
ASD Diagnosis	45%
Elevated Anxiety (> 1 SD)	52%
IQ (SD)	88.6 (19.2)

Grant No: R21 MH114075; MPIs: McIntyre & Sabb

## “Cool” Self Regulation predicted both anxiety and sensory overload for youth with ASD and DD

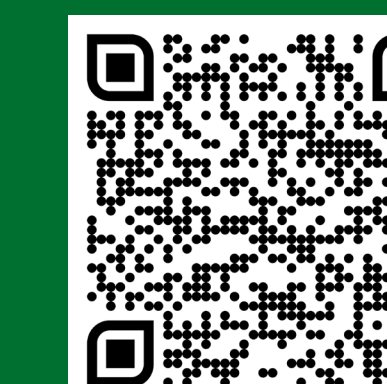
“Cool” self-regulation is the ability to control or change cognitive and behavioral responses to neutral (non-emotional) situations

Self regulation is a potential intervention target to reduce distress associated with anxiety and sensory overload



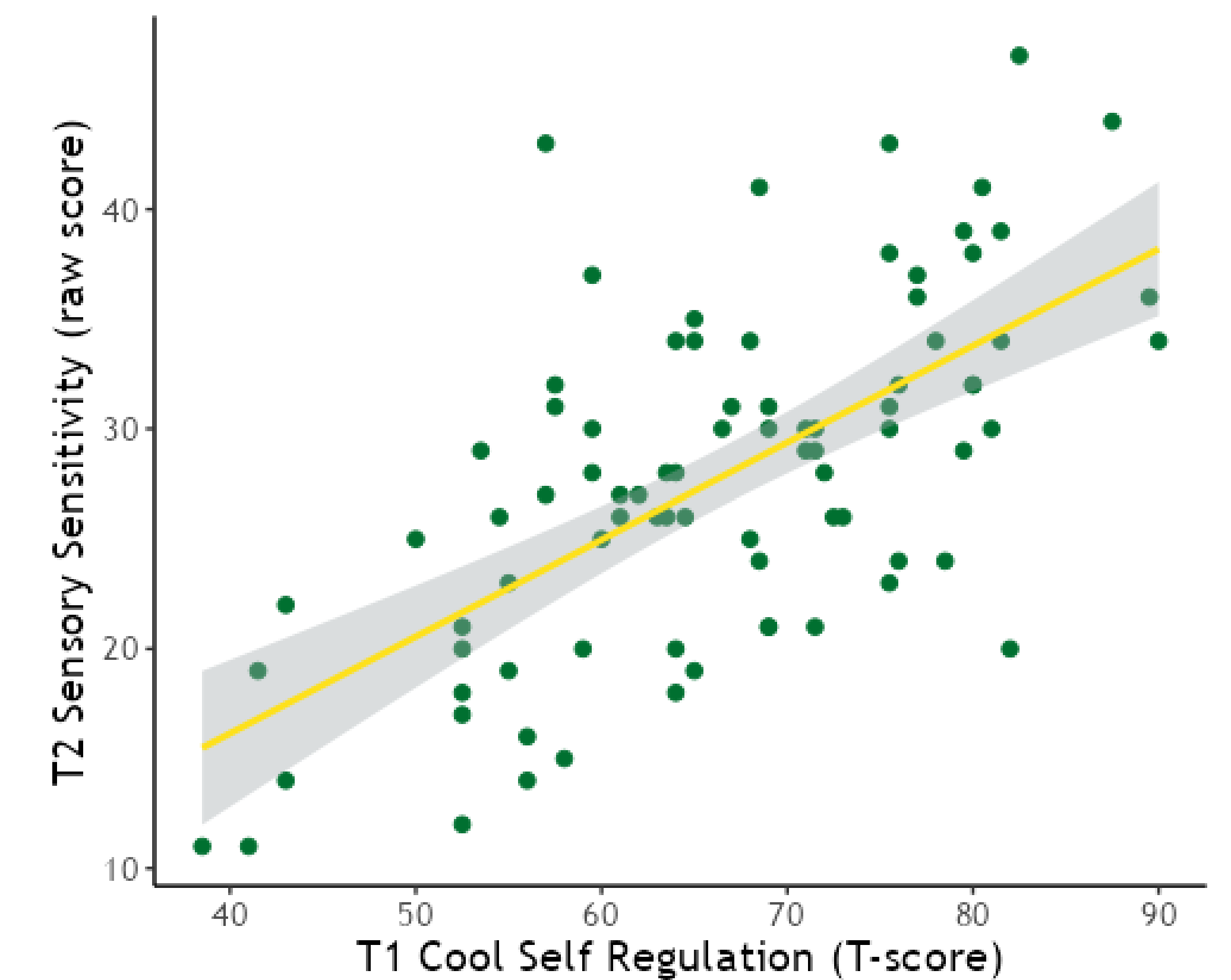
	Odds-Ratio (p-value)	Std. B (p-value) Sensory Sensitivity	Std. B (p-value) Sensory Avoidance
<b>Anxiety Status</b>			
Hot SR	0.47 (.07)	0.05 (.61)	0.01 (.89)
Cool SR	3.30 (.003) *	0.58 (< .001) *	0.64 (< .001) *
ASD status	1.33 (.24)	0.01 (.89)	0.17 (.04) *
IQ	0.90 (.69)	-0.15 (.07)	0.02 (.76)
R-squared	---	.44	.47

References  
Resources  
Digital Poster



## Results

We hypothesized “cool” SR would relate more to SOR, while “hot” SR would better predict anxiety



“Cool” self regulation predicted all outcomes  
“Hot” self regulation marginally predicted anxiety

## Conclusions

- “Cool” self-regulation may be a shared mechanism between SOR and anxiety.
- Poor self-regulation also relates to “avoidant” responses, indicating potential shared behaviors
- Self-regulation has been shown to change with intervention in TD populations.
- More research is needed determine treatment vs accommodation of SOR within context of valid treatments of anxiety
- Future work could incorporate behavioral and neuropsychological measures of “hot” and “cool” self-regulation to supplement methods
- Future work may also investigate the degree to which shared neurobiological mechanisms of anxiety and SOR explain “cool” SR, such as amygdala - prefrontal connectivity

eglenn2@uoregon.edu | eglenn2.github.io