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Preschool anxiety is associated with physiological dysregulation, measured as RSA variability, during cognitively challenging tasks eliciting cool EF, but NOT hot EF.



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INTRODUCTION

The emergence and maturation of self-regulation in preschool aged children relates to their physiological arousal during challenging situations. Vagal activity, implicated in the parasympathetic nervous system and often measured by respiratory sinus arrhythmia (RSA), has been used as an indicator of capacity to regulate arousal. “Hot” arousal involves processing information related to emotion and motivation, while “cool” does not.

Studies exist on RSA variability and executive functions (EF) in laboratory challenges; however, few explore the relationship within cool and hot domains of EF.

Lower self-regulation has been associated with greater risk for child internalizing and externalizing symptoms.

The current project has 3 goals:

1. Examine separate physiological variability during cool and hot EF from baseline.
2. Examine the relationship between physiological variability and performance on EF tasks.
3. Elucidate associations of physiological regulation during cognitive tasks on child internalizing and externalizing outcomes.

METHODS

The sample size consisted of 49 children aged 4-7 years (mean=5.5; SD=0.89) from English- or Spanish-speaking families in the Houston metropolitan area.

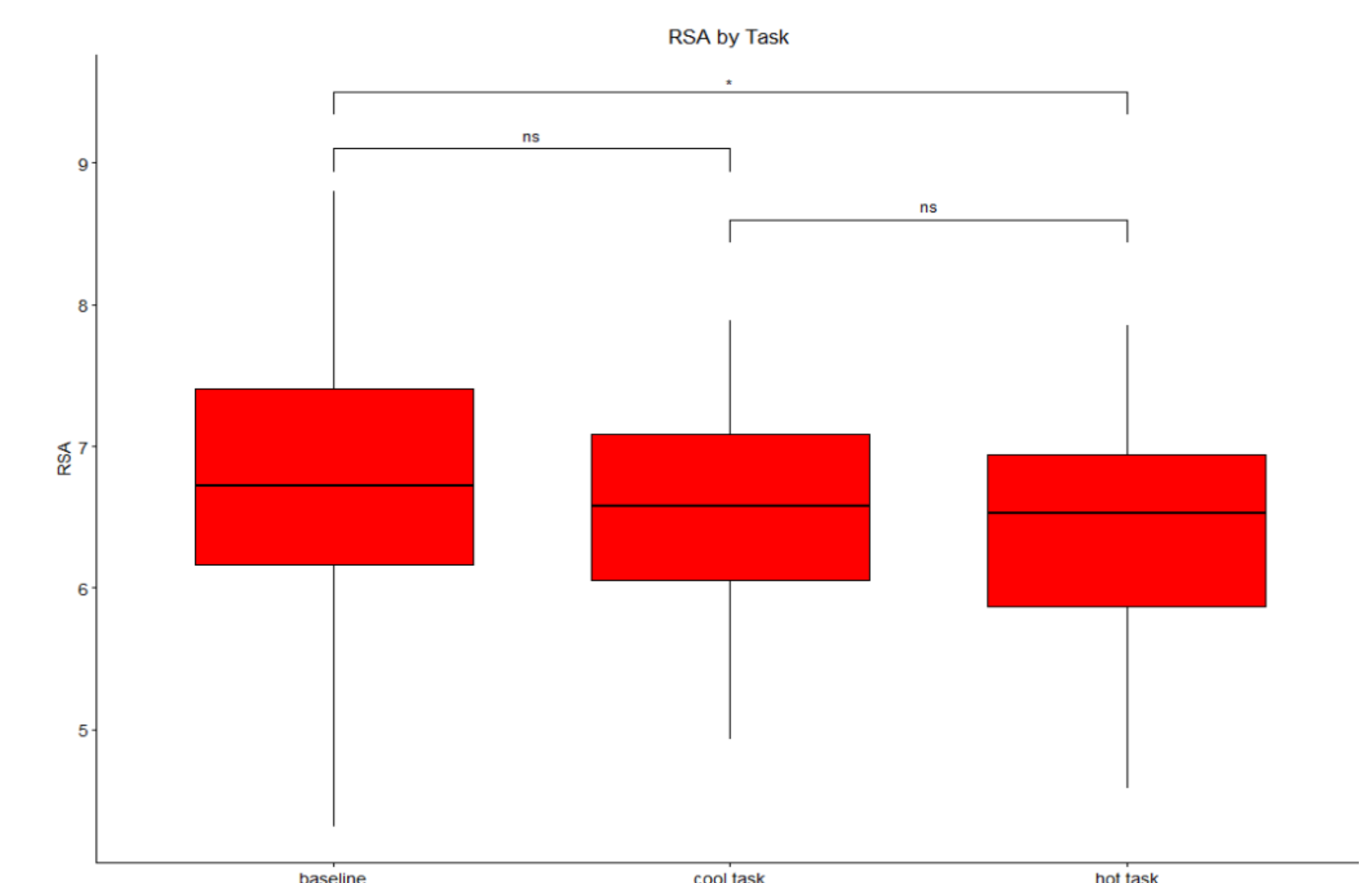
Internalizing and externalizing symptoms were reported by caregivers using the BASC-3. RSA was collected during 4 laboratory tasks, two of which elicited cool EF and two hot EF.

Composite scores were created for RSA measurements from cool EF tasks, Bear-Dragon and Stroop, and from hot EF tasks, Delayed Gratification and Toy-in-Box.

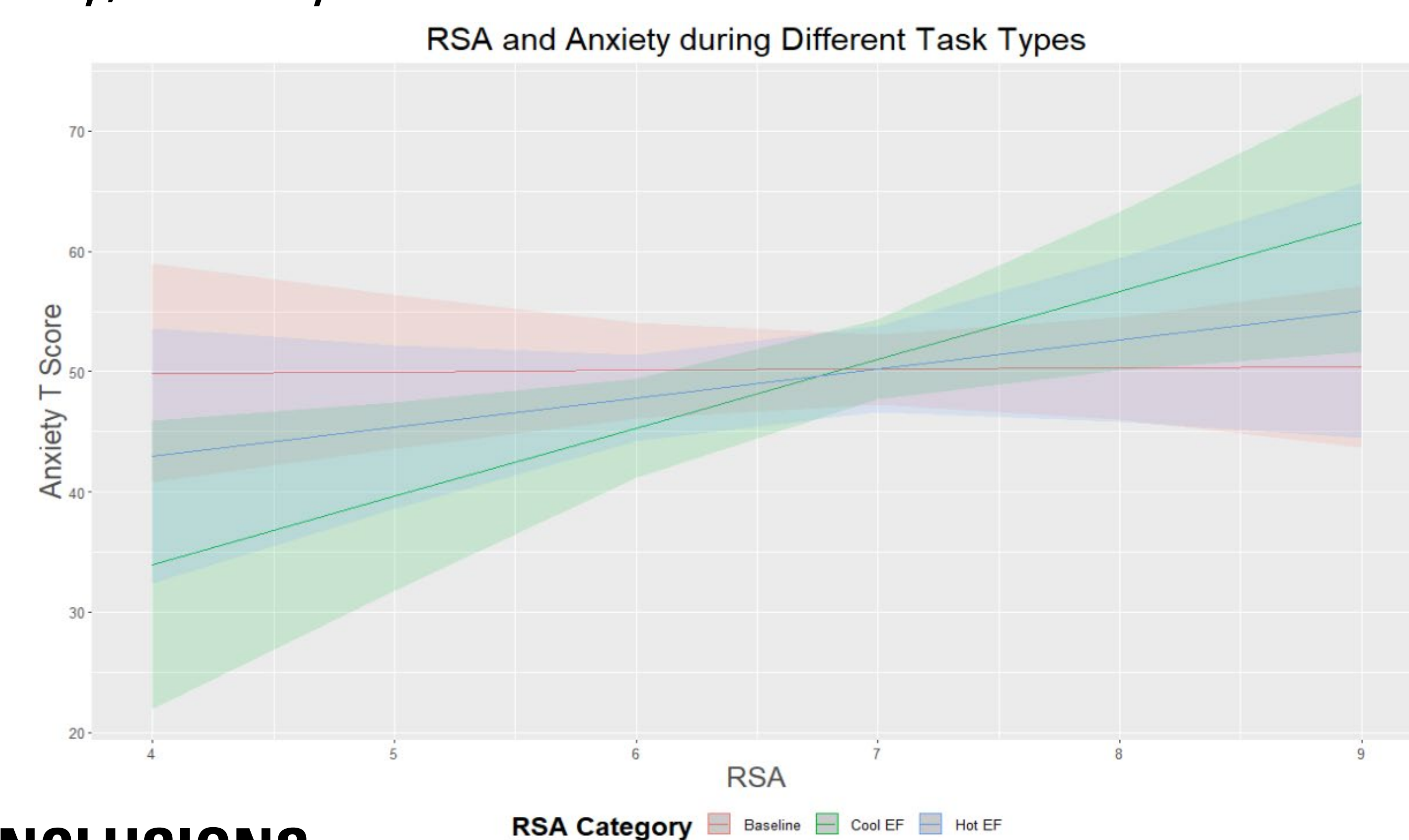
RESULTS

Baseline RSA varied significantly with RSA during hot EF, but not cool EF.

Greater RSA reactivity during cool tasks was associated with better performance of cool EF.



There was an interaction between RSA during the task and EF domain, such that higher RSA during the task predicted higher anxiety, but only for cool tasks.



CONCLUSIONS

Findings indicate a nuanced relationship between risk for psychopathology, self-regulatory abilities, and cognitive control, such that physiological variability exists during the type of EF elicited (i.e., cool versus hot) during cognitive challenges.

These data highlight the need to consider different constructs when examining the etiological mechanisms for psychopathologies in at-risk preschool-aged children.