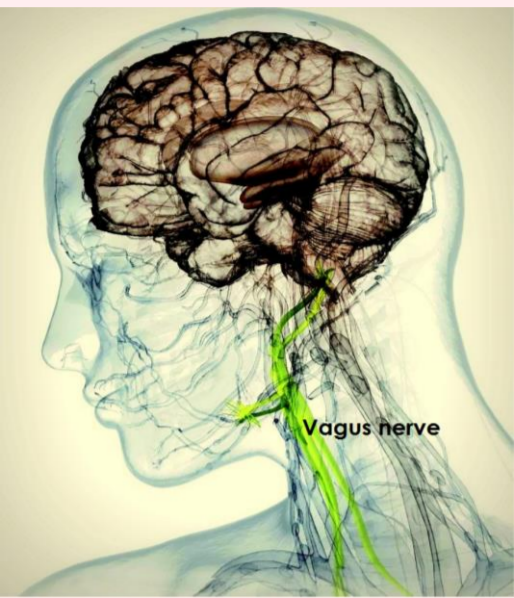


# Autonomic Flexibility in Childhood Anxiety Disorders

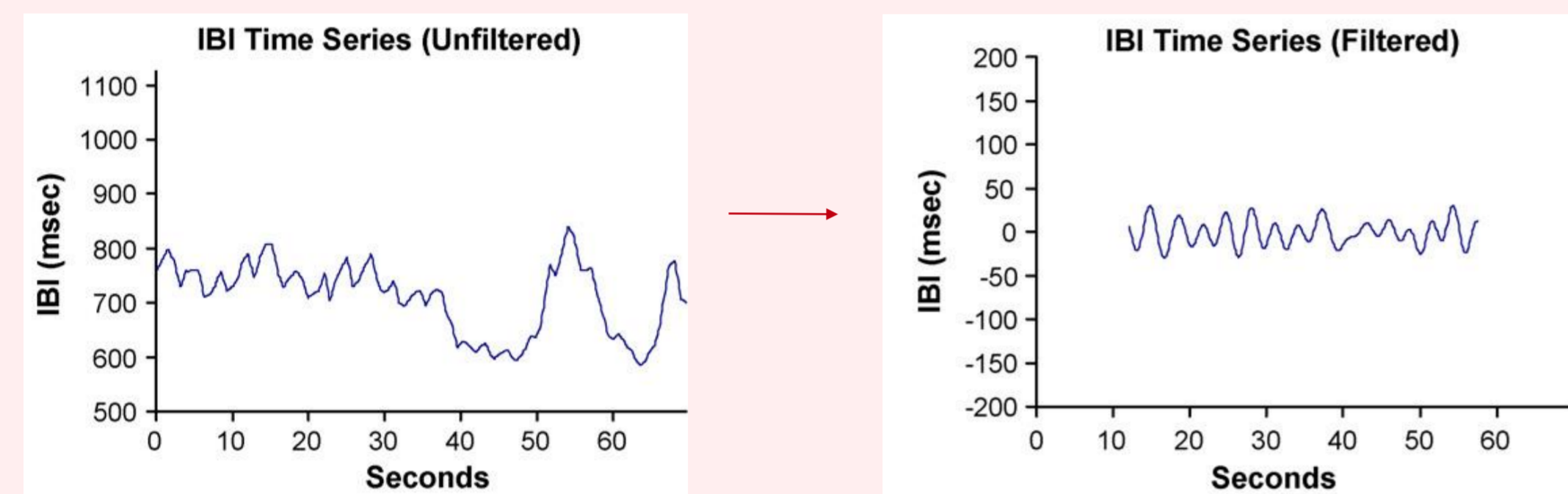
Anna Alkozei | Dr Cathy Creswell | Prof Peter J Cooper | Dr John J.B. Allen

## Background



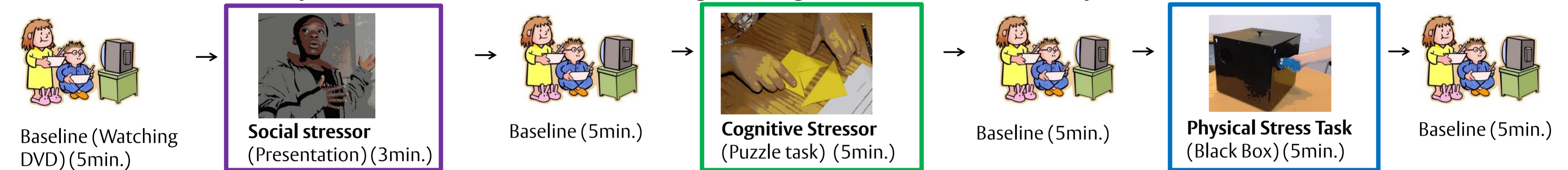
The **vagus nerve**, the 10<sup>th</sup> cranial nerve, acts like a brake to the heart, responds to changes in respiration, and is associated with **appropriate autonomic responding to stress**. It's activity is approximated using respiratory sinus arrhythmia.

**Respiratory Sinus Arrhythmia (RSA)** (respiratory induced heart rate variability): taking the natural logarithm of .12-.40 Hz filtered time-sampled interbeat interval (IBI) series



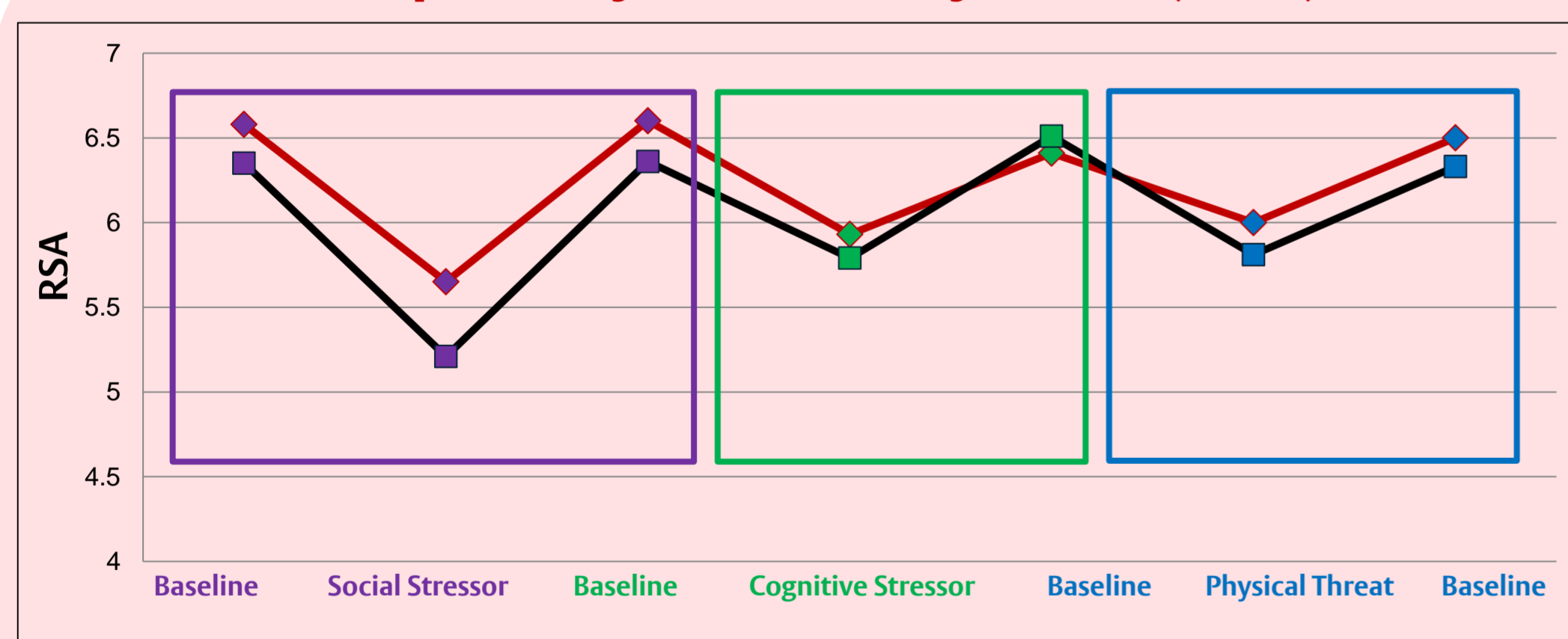
## Method

RSA and HR were measured using Actiheart heart rate monitors and software (Version 4) during stress and non-stress conditions in 60 clinically anxious and 30 non-anxious, age- and gender- matched, 7-12 year olds.



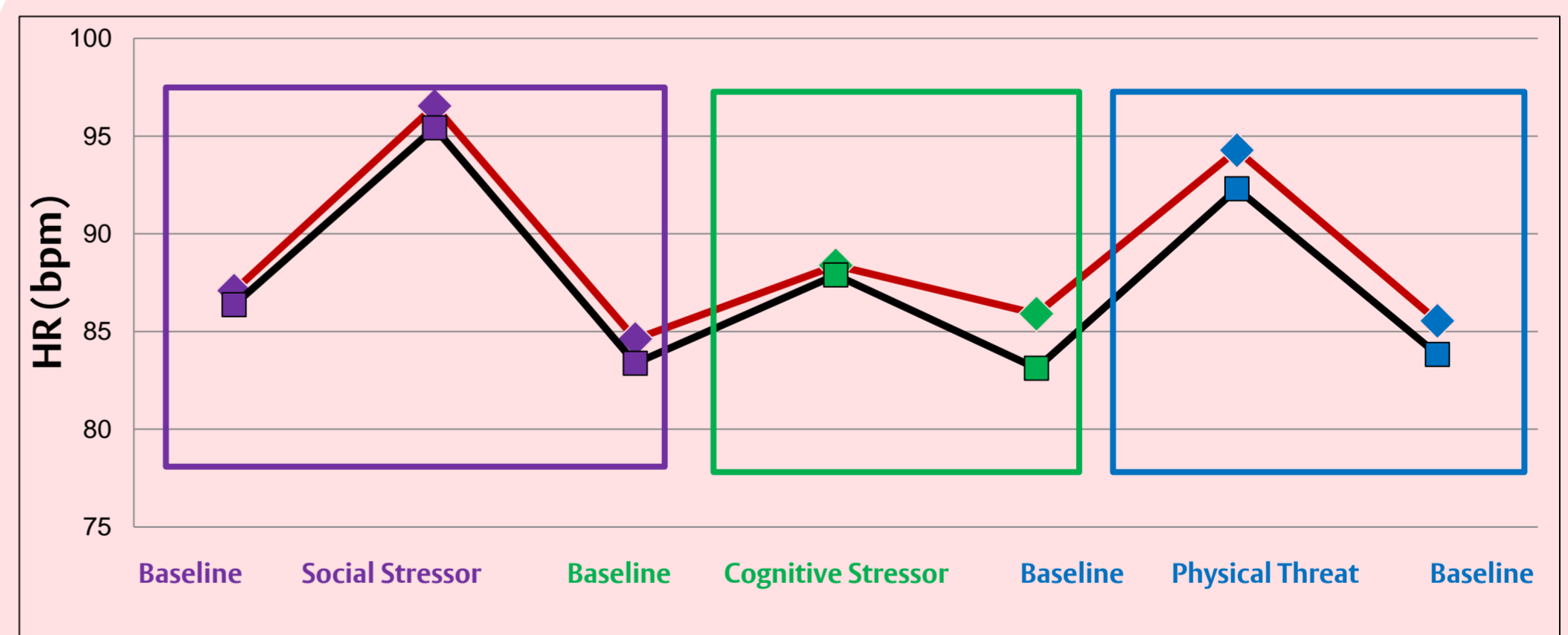
## Results

### Respiratory Sinus Arrhythmia (RSA)



- Significant main effect of task, such that RSA decreases in response to stress and increases during rest – regardless of group

### Heart Rate (HR)



- Significant main effect of tasks, such that HR increases in response to stress and decreases during rest– regardless of group

## Discussion

The results suggest that anxious and non-anxious children do not differ in RSA and HR at baseline and in response to stress. This shows that anxious children show a different pattern of physiology compared to anxious adolescents and adults who evidence diminished RSA and increased HR at rest, and a blunted response to stress<sup>3</sup>. The findings of this study suggest that physiological dysregulation might therefore be the result of chronically maintained anxiety rather than a causal factor in its development.

### Contact information

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**References** 1. Schmitz, J., et al. (2011). Restricted autonomic flexibility in children with social phobia. *The Journal of Child Psychology and Psychiatry*, 52 (11), 1203-1211. 2. Kossowsky, J., et al. (2011). Separation anxiety disorder in children: disorder-specific responses to experimental separation from the mother. *The Journal of Child Psychology and Psychiatry*, 53 (2), 178-187. 3. Lyonfields et al. (1995). Vagal tone in generalized anxiety disorder and the effects of aversive imagery and worrisome thinking. *Behavior Therapy*, 26 (3), 457-466. **Acknowledgments** • Berkshire Child Anxiety Clinic