

# Baseline vagal tone predicts social connectedness, positive emotion and may predict progesterone levels.

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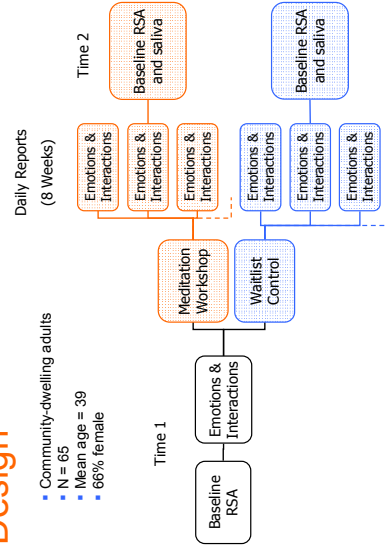
THE UNIVERSITY  
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at CHAPEL HILL

## Introduction

- "Other-focus" is defined as moments in which the individual looks outside of the self and attends to other humans in the environment.
- **Bodymind model of affiliation and health:** (Kok & Fredrickson, under review)
  - Vagus nerve + oxytocin activity
    - Attention to others + positive emotions
    - Other-focused behaviors + health
    - Greater vagus nerve + oxytocin activation
- Respiratory sinus arrhythmia (RSA) is one index of vagal control, also known as cardiac vagal tone (see Box 1).
- **By training participants in loving-kindness meditation, an other-focus intervention** (Fredrickson et al., 2009; Hutchinson, Seppala & Gross, 2008), **this study tests:**
  - The moderating effect of vagal tone on the effects of loving-kindness meditation (LKM).
  - The effect of LKM on vagal tone and on progesterone, a proxy for oxytocin (Miyamoto & Schams, 1981).

## Design

- Community-dwelling adults
- N = 65
- Mean age = 39
- 66% female



## Box 2: Respiratory Sinus Arrhythmia (RSA): Measure of Cardiac Vagal Tone

• Cardiac vagal control can be measured by respiratory sinus arrhythmia (RSA).

$RSA = \frac{MAX\ expiration\ interval\ (BI) - MIN\ inspiration\ (BI)}{seconds}$  (Grossman, 1983)



Figure from Cuthill, Pogres & Lyon, 1986

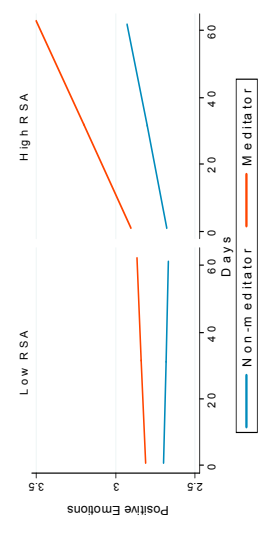
• Analyses were conducted using the mean of RSA values over a two minute baseline period.

## Hypotheses

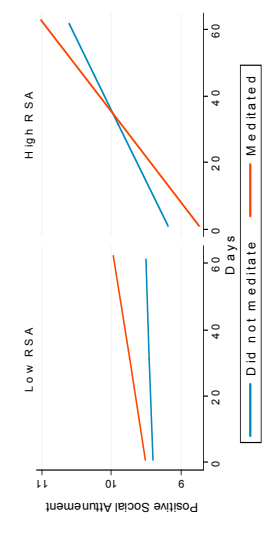
1. Baseline RSA will moderate the effects of loving-kindness meditation (LKM) on positive emotions and other-focused attention.
2. Participants engaged in LKM will increase in baseline RSA over the course of the study.
3. Participants engaged in LKM will increase in baseline progesterone over the course of the study.

## Results

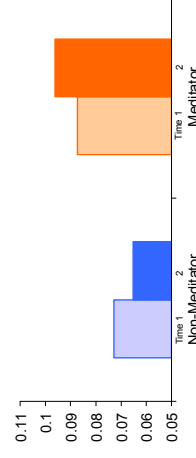
Baseline RSA moderates the effects of LKM on positive emotions.



Baseline RSA moderates the effects of LKM on other-focused attention.



Baseline RSA is increased after eight weeks of LKM practice



	Mediator	N	Non-Mediator	N
Men	$r = 0.67^*$	7	0.46	11
Women	$r = 0.42 \sim$	16	-0.21	16

## Discussion

1. As predicted by the bodymind model, high baseline vagal tone was related to greater changes in positive emotions and social attainment over the course of the study, especially for meditators.
2. An other-focus intervention led to raised baseline vagal tone after eight weeks.
3. For meditators only, baseline vagal tone and baseline progesterone were significantly correlated at the end of the study.

The capacity of the individual to experience and benefit from other-focus comes, at least in part, from physiological factors such as vagal tone, providing evidence for the role of the body in promoting positive affiliative states.