

INTRODUCTION

- Anxiety-related Cognitive Biases (CB):**
 - Cognitive Bias (CB), or exaggerated, selective attention toward threatening stimuli, and interpretive biases (IB) when faced with ambiguous information are greater in anxious individuals [1,2]
- Dot Probe (DP) and Posner Spatial Cueing Paradigms:** used to assess CB in anxious individuals; serves as an index of relatively bottom-up attentional biases
- Word Sentence Association Paradigm (WSAP):** Used to assess IB, a relatively top-down, elaborative CB [3]
- The psychometric properties of CB assessments have been called into question [4]
 - Low task convergence validity [5,6], e.g. the emotional Stroop [5,8] and other versions of the DP [9]
- Little research has examined covariance among CB and IB assays [10], particularly the Posner and WSAP, and their links with anxiety [11,12]**

STUDY AIMS

- Assess the cross-task convergence between the Posner paradigm, DP paradigm, and WSAP tasks in a healthy college-aged sample
- Assess the relations between anxiety and three measures of CB

HYPOTHESES

- All three measures of CB (DP, Posner, and WSAP) will be intercorrelated.**
- Bottom-up measures of CB (DP, Posner) will be sensitive to affective context whereas top-down IB measured via WSAP will be associated with trait measures of anxiety.**

RESULTS

1. Relationship Between CB Measures

At baseline, all ns (all p 's > .17).

2. Bottom-Up CB Measures Are Sensitive to Affective Context

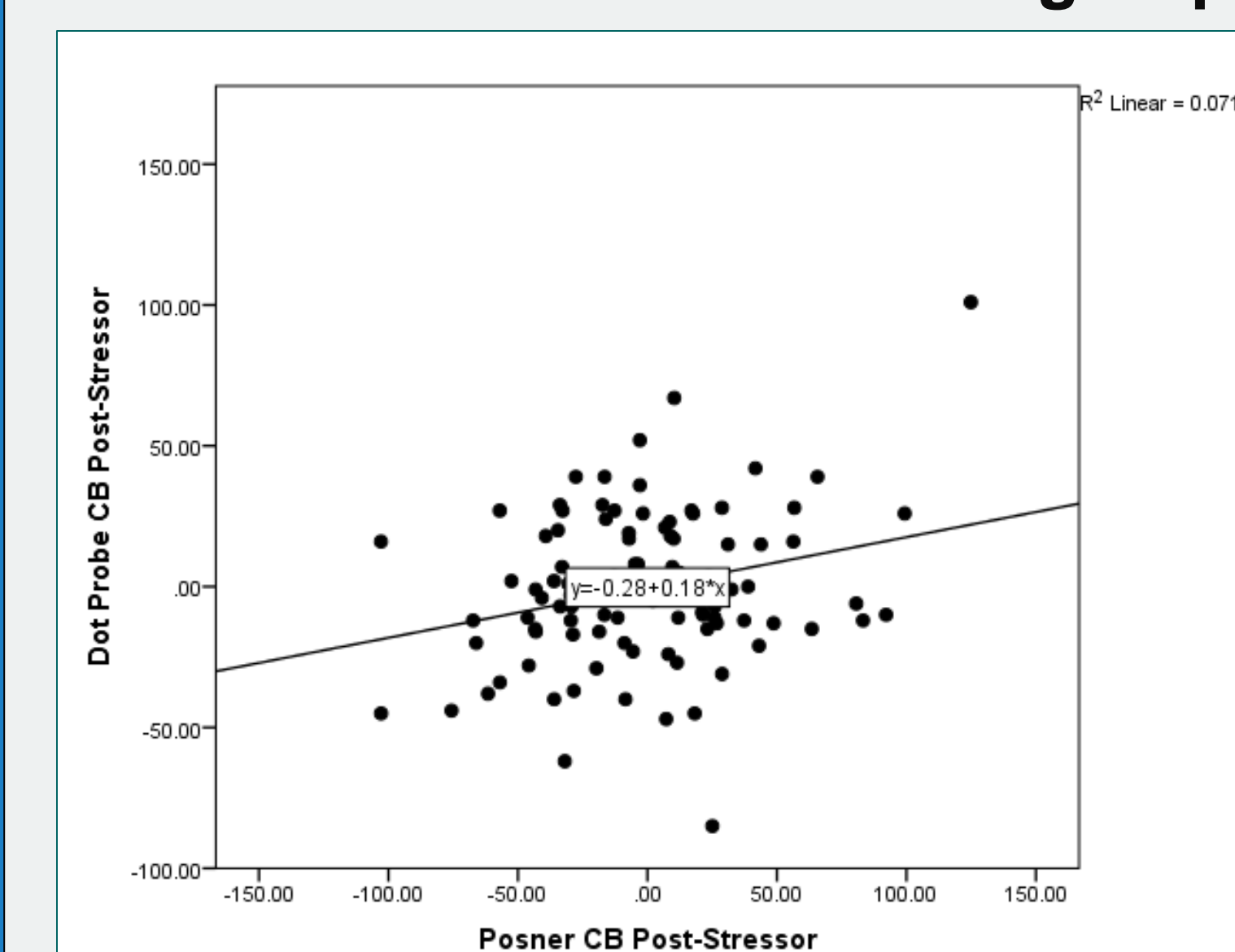
Stressor manipulation check

- Post-stressor (vs control), individuals reported significantly higher levels of negative mood ($p < .001$) and lower levels of positive mood ($p < .001$).

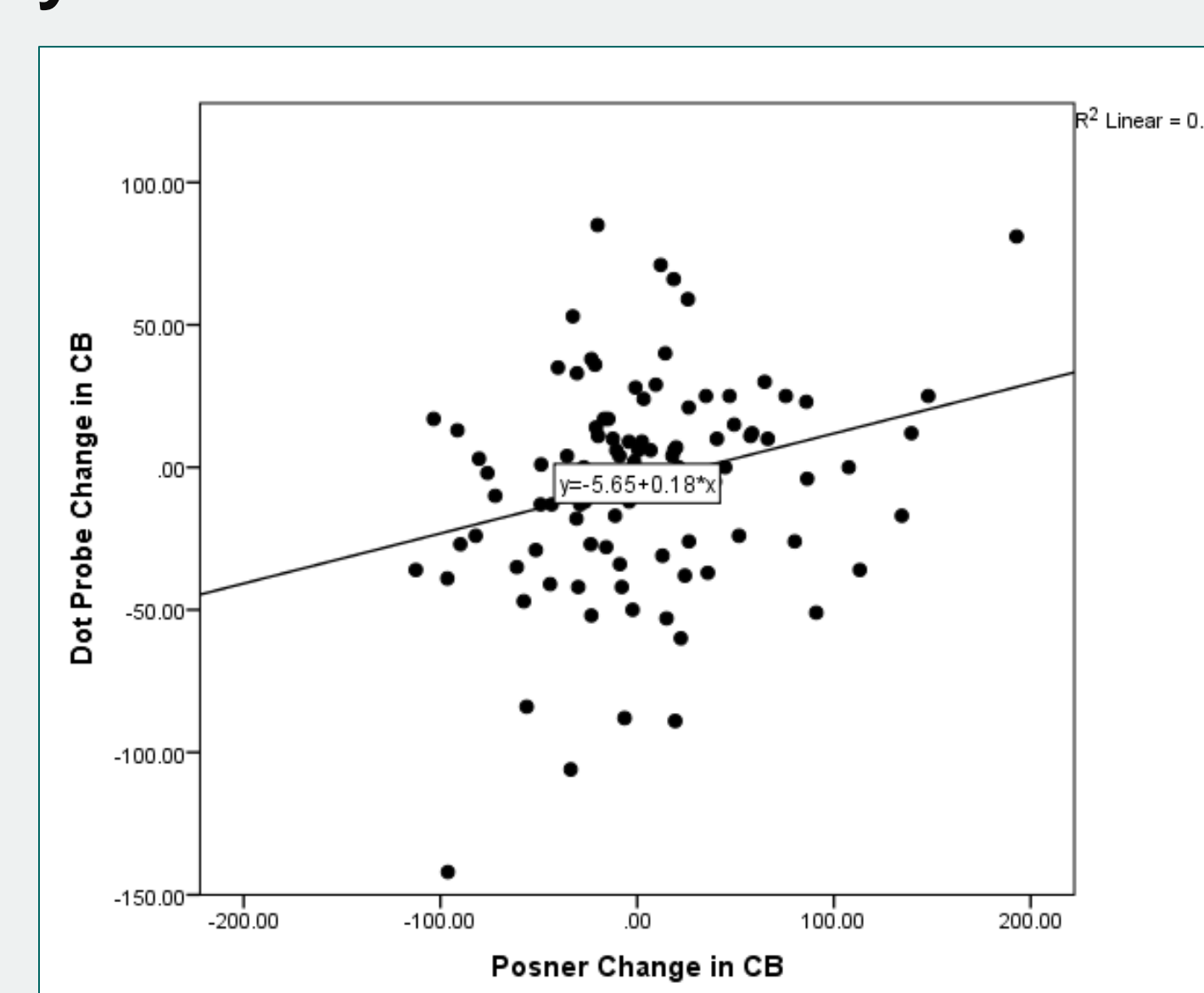
| | Easy | Difficult | t | df | p |
|-----------------------------|-------------|--------------|-------|------|-------|
| AMS- Anxious Change | .28 (.46) | 2.11 (6.32) | -2.38 | 211 | .02* |
| AMS – Sad Change | .27 (3.33) | 2.72 (6.27) | -3.59 | 211 | .00** |
| AMS – Happy Change | .66 (4.04) | -1.94 (5.75) | 3.82 | 211 | .00** |
| PANAS Right Now – NA Change | -.04 (2.17) | 1.63 (4.02) | -3.81 | 213 | .00** |
| PANAS Right Now – PA Change | 1.83 (5.61) | -1.2 (5.81) | 3.89 | 213 | .00** |

Note: * p is significant at .05; ** p is significant at .001

Post-stressor an increase in DP scores was correlated with an increase in Posner scores in the stressor group only.



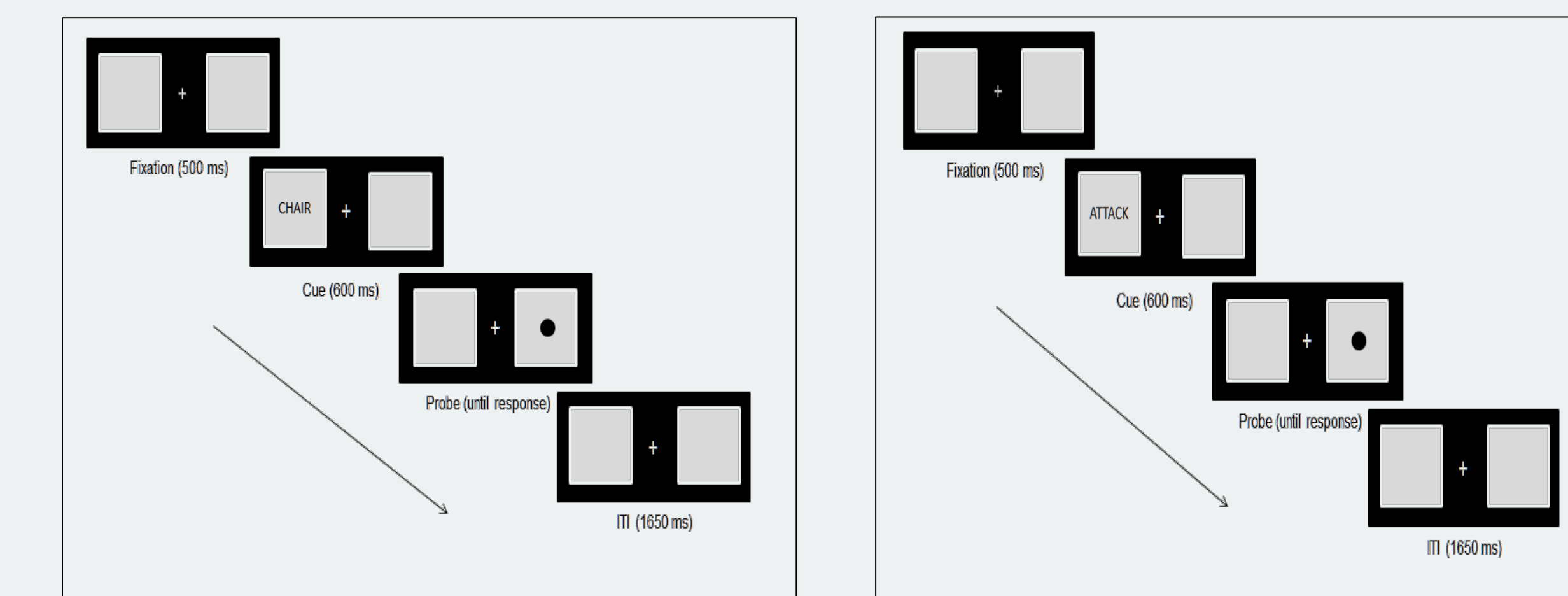
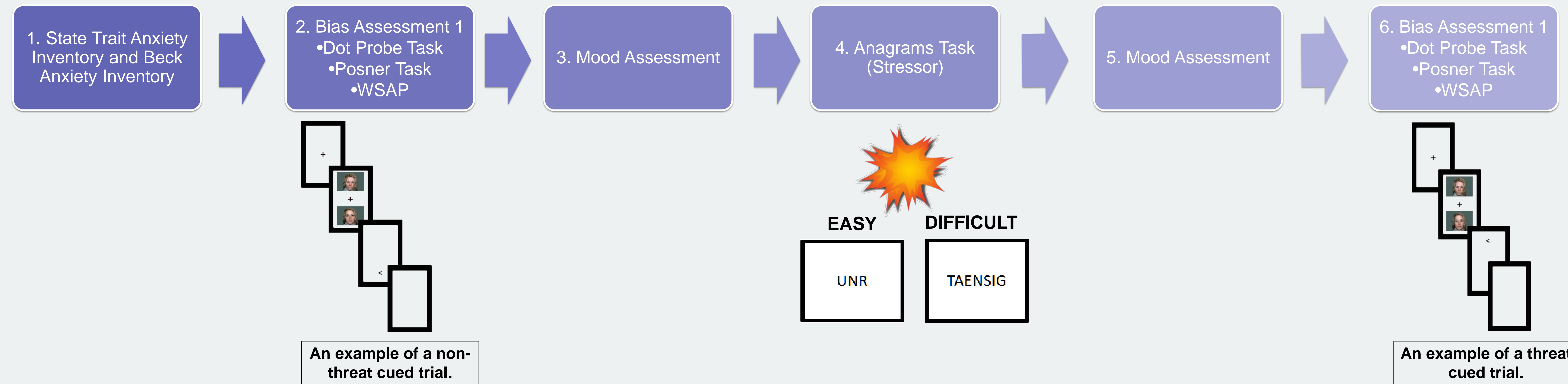
Increased Posner CB was associated with increased DP CB $r(104) = .267, p < .01$.



Increased Posner change scores were associated with DP change scores, $r(104) = .267, p < .01$.

METHOD

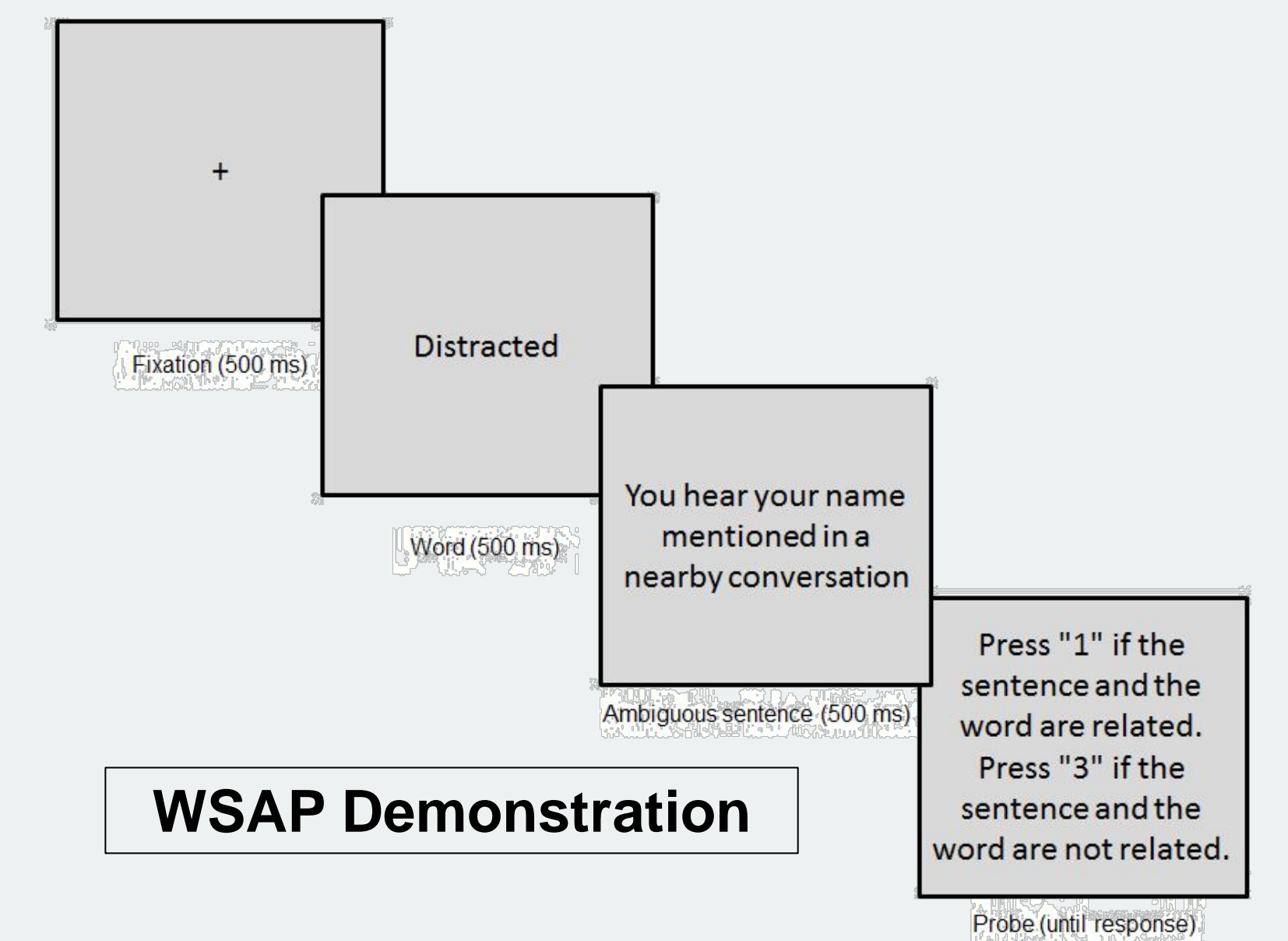
Participants were 215 (151 female) adults from an introductory psychology class, ($M = 20.09, SD = 3.14$).



An example of an invalid cued trial of the Posner

| Threat Bias Scores | Measurement |
|---------------------|--|
| Dot Probe CB Scores | mean RT probes replacing neutral – mean RT probes replacing threat (mean RT threat invalid trials– mean RT threat valid trials) – (mean RT neutral invalid trials– mean RT neutral valid trials) |
| Posner CB Scores | mean RT reject threat – mean RT endorse threat |
| WSAP IB Scores | (total number threat endorsements / total threat word trials) x 100 |

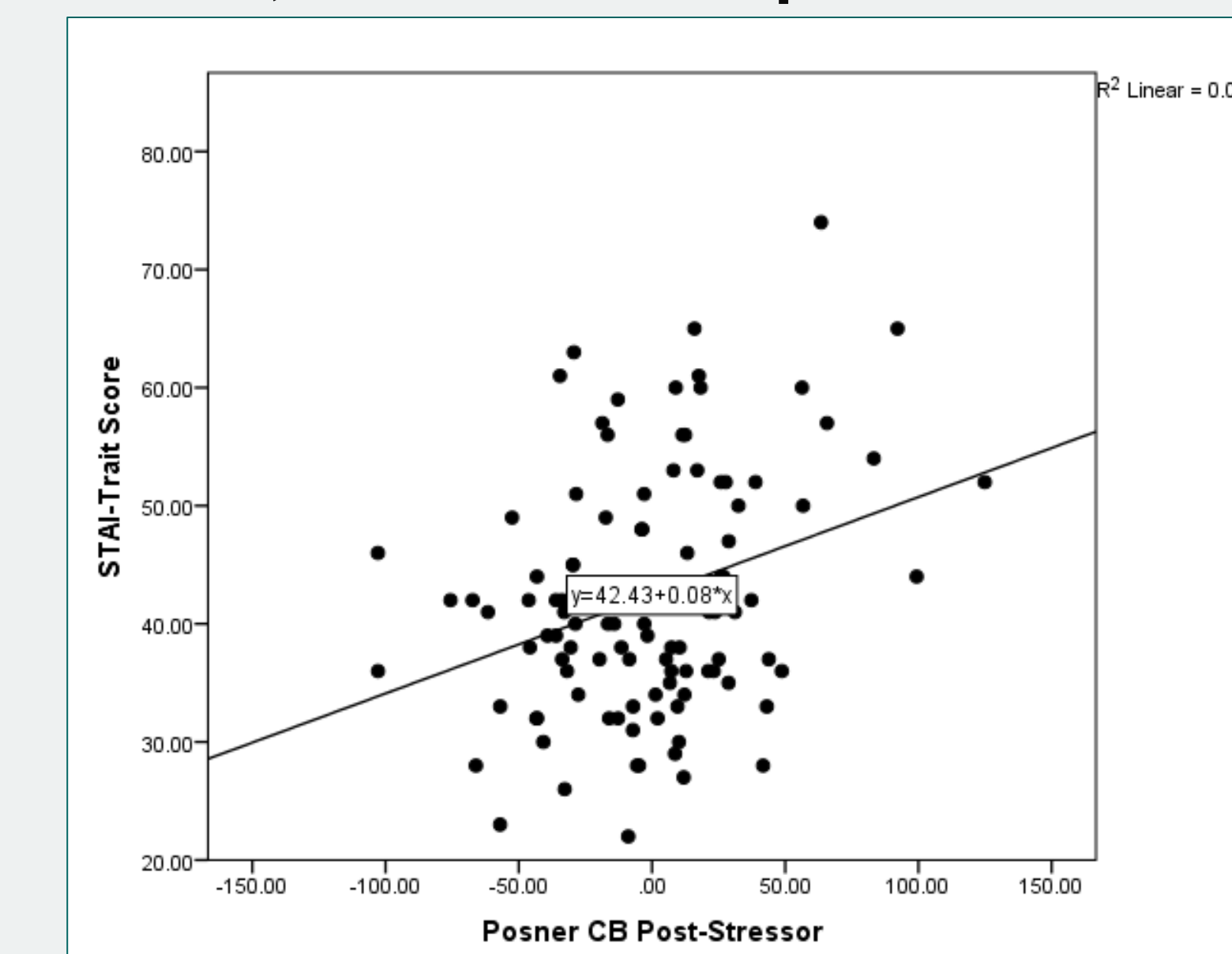
*Positive scores indicate a bias towards threat; Negative scores indicate a bias away from threat.



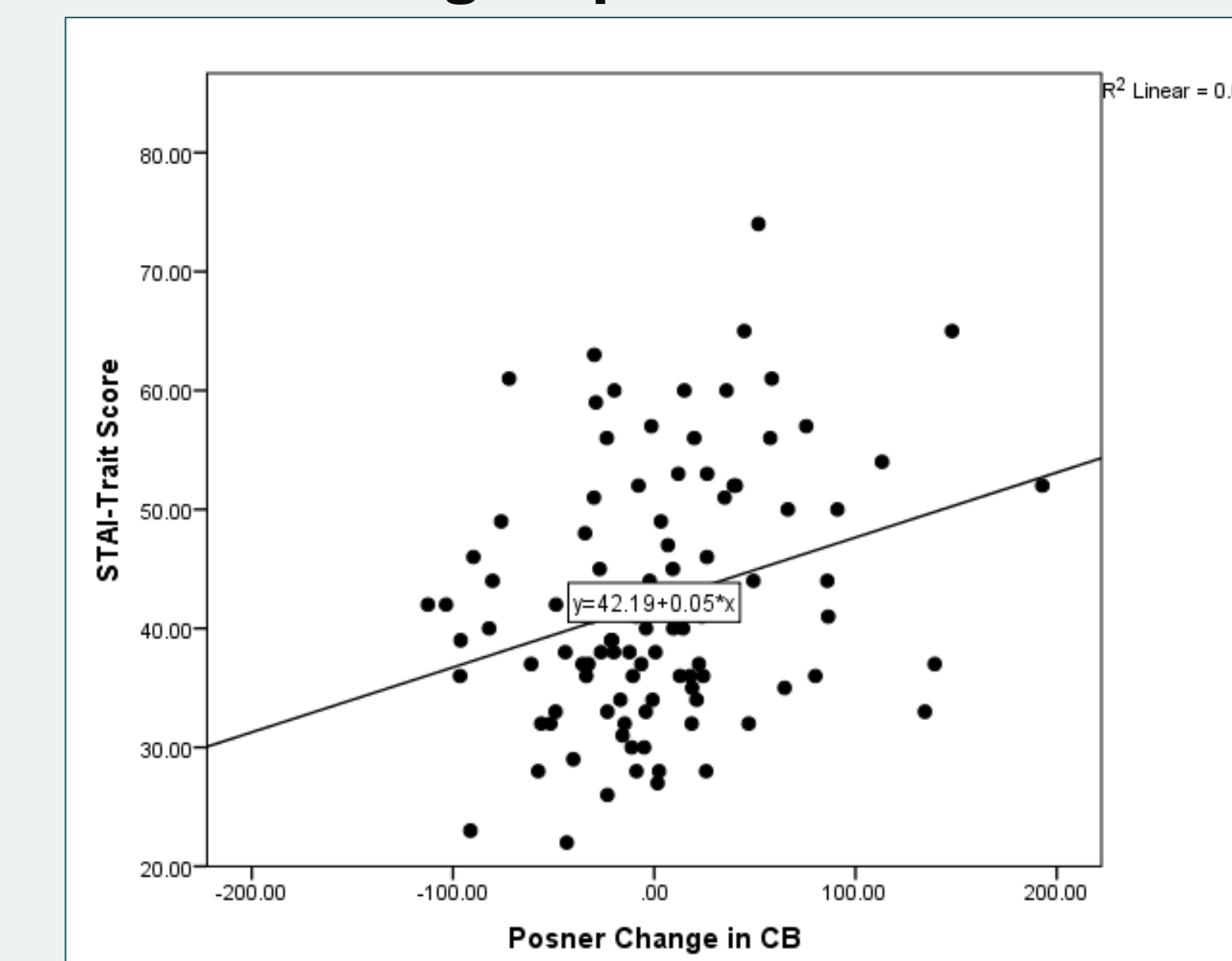
WSAP Demonstration

RESULTS CON'T

Posner, not DP scores predicted trait anxiety in the stressor group.



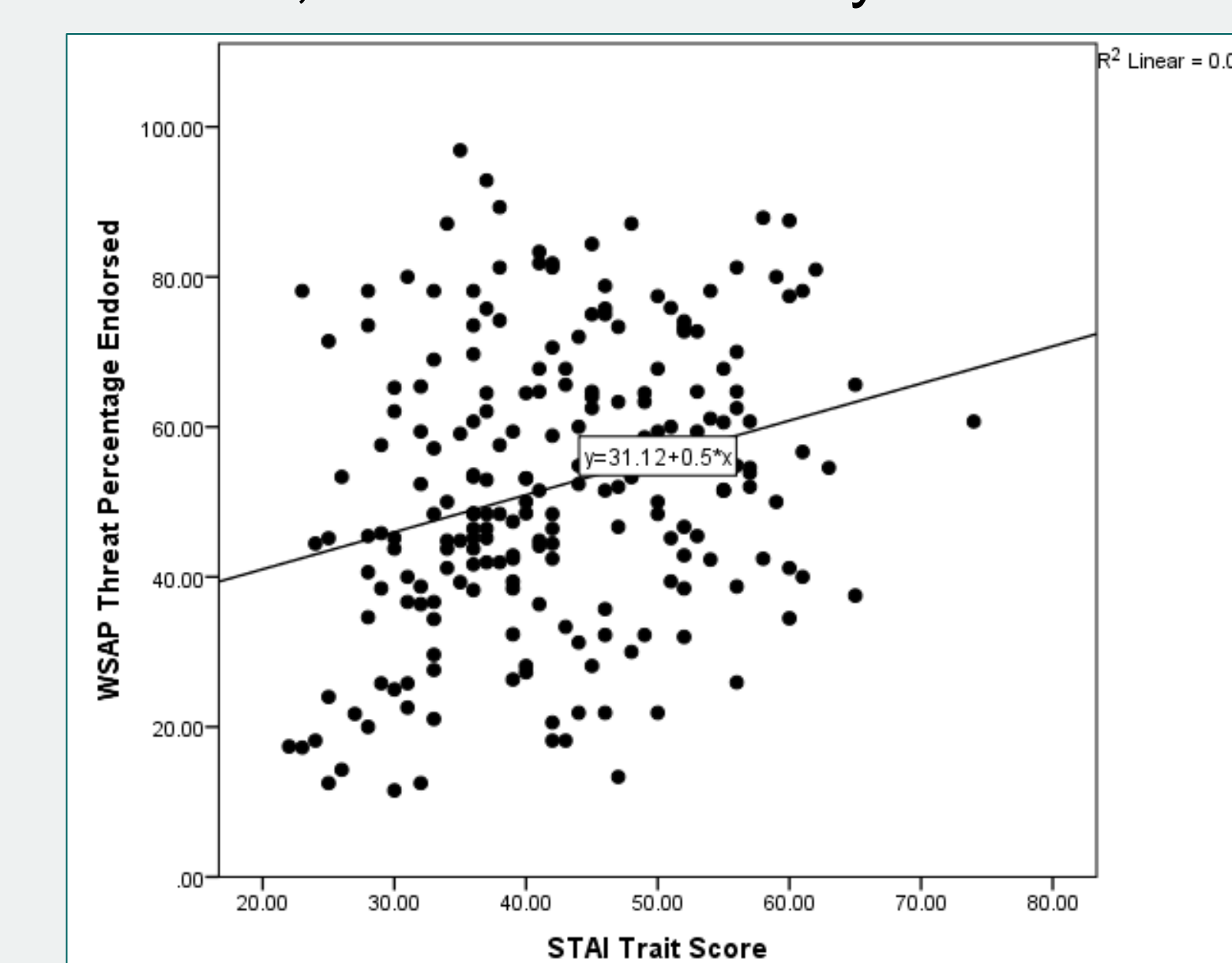
Full model: $R^2 = .1, F(2,98) = 5.53, p < .05$; Posner: $\beta = .33, t(98) = 3.31, p = .001$.



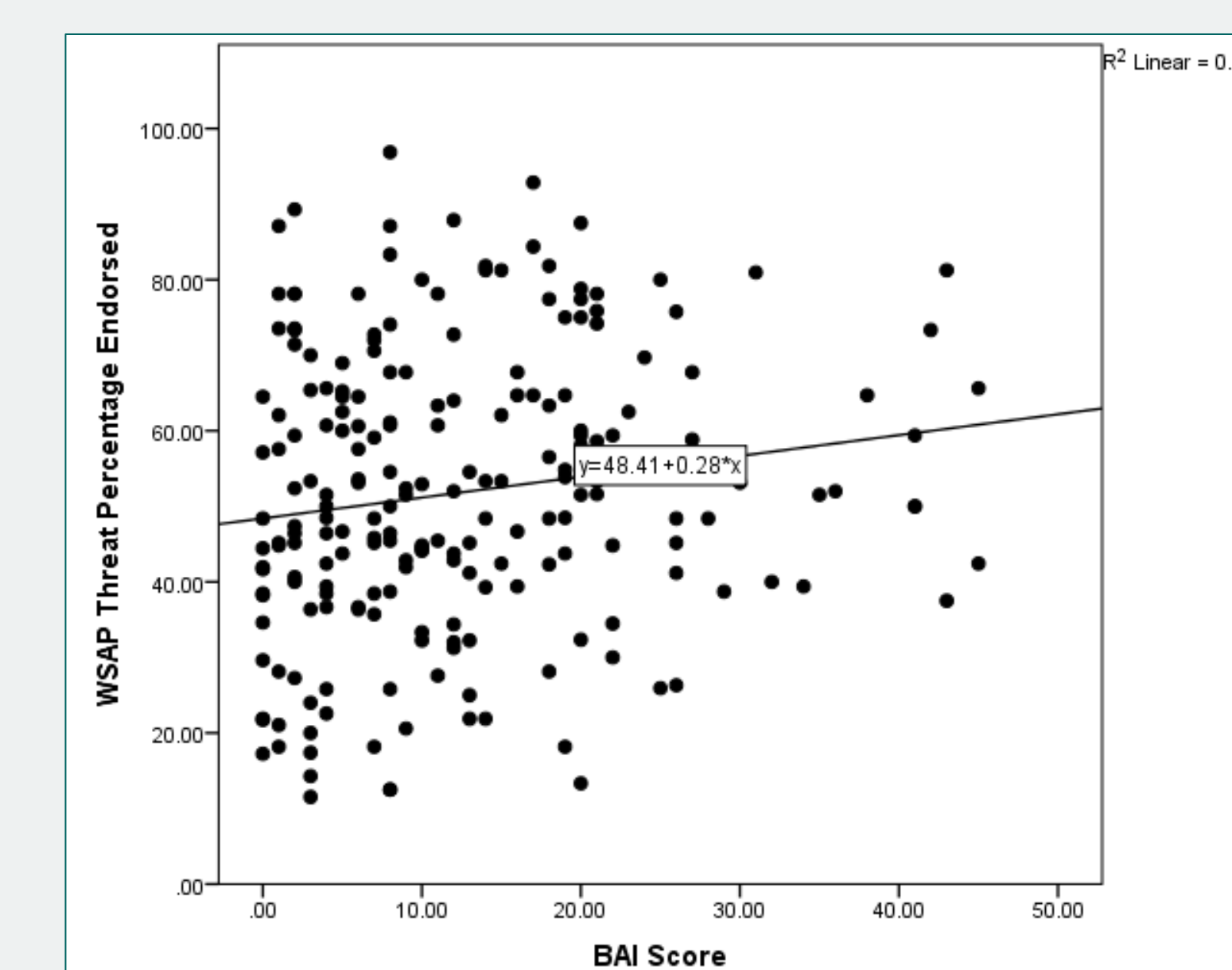
Full model: $R^2 = .1, F(2,97) = 4.58, p < .05$; Posner: $\beta = .305, t(98) = 3.03, p = .003$.

3. Top-Down IB (WSAP) Was Sensitive to Trait Anxiety

The percentage of threat endorsements was significantly correlated with trait anxiety at baseline, but not affected by affective context.



WSAP threat endorsed percentage was associated with trait anxiety, $r(214) = .27, p = .00$



WSAP threat endorsed percentage was associated with BAI scores, $r(214) = .16, p = .02$

DISCUSSION

- Cross-task convergence in bottom-up CB measurement only after a stressor**
 - CB measured by Posner rather than the more commonly-used DP was able to account for significant variance in trait anxiety in this non-clinical sample, but only after the stressor.
- CB may be sensitive to those who are non-anxious**
 - May also be a vulnerability factor after being exposed to stress to those with stable traits such as trait anxiety [12]
- Results highlight the importance of integrating multiple measures in studies of CB and examining the role of stress in CB measurement including top-down processes like ones measured via the WSAP.**
- This is one of the first studies to examine the cross-task convergence between dot probe, Posner, and WSAP for CB assessment in a healthy sample

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