Attentional control as a potential mechanism linking worry and error monitoring: An event-related potential study

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FEAR LAB
Factors of Emotional/Affective Risk

INTRODUCTION

- Individuals high in worry tend to demonstrate heightened error-related negativity (ERN), an important index of error monitoring.
- Individuals high in worry also evidence increased difficulty regulating their attention.
- Heightened attentional control (AC) is associated with decreased ERN.
- The literature lacks thorough investigations of the three-way relation among these constructs.

OBJECTIVES

- To examine the indirect effect of worry on ERN amplitude through AC.
- Evaluate relation between self-report AC and a physiological index of AC.

METHODS

Participants:

- Participants consisted of community adults recruited to participate in research.
  - (N = 61; M age = 29.6, SD = 13.26, 68.9% female)
  - All participants passed 2 validity checks.

Measures:

- Attentional Control Scale Straightforward
  - α = .88
- Penn State Worry Questionnaire-5
  - α = .95
- Electroencephalography (EEG) Measures
  - Occipital Alpha (OA)
  - Error-Related Negativity (ERN)

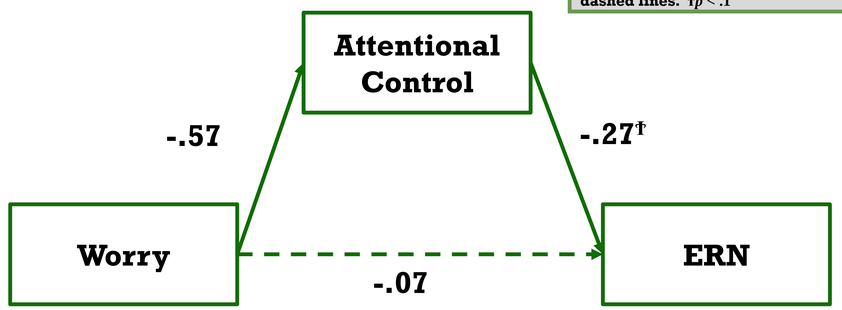
Statistical Analyses:

- Path analysis was used to examine relations between worry, AC (both self-report and OA), and ERN.
- 5000 asymmetric bootstrapped draws were taken to ensure robust confidence intervals.
- Standardized effects are reported.

RESULTS

Path Indirect Effect Models

Nonsignificant effects are represented by dashed lines. †$p < .1$



Confidence Intervals for Indirect Effects

Indirect Effect Model	B (Ind)	Lower CI (95%)	Upper CI (95%)	Lower CI (90%)	Upper CI (90%)
Attentional Control	.15	-.01	.33	.02	.30
Occipital Alpha	.00	-.06	.05	-.05	.04

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Correlation Matrix

Variable	1	2	3	4
1. Worry	1			
2. Attentional Control	-.57***	1		
3. Occipital Alpha	.15	-.08	1	
4. ERN	.07	-.21	-.03	1

*p < .05, **p < .01, ***p < .001

DISCUSSION

- ERN amplitude was marginally related to worry through self-reported AC, but not significantly related to worry through OA.
- Worry was moderately correlated with self-reported AC, but not with OA.
- Self-reported AC was not significantly correlated with OA.
- This study is limited by a cross-sectional examination of indirect effects.

Future Directions

- More research is needed to establish convergence among self-report and neurophysiological indicators of AC. OA may not adequately represent AC.
- The relation between AC and ERN should be evaluated using other measures of AC.
- A more robust relation between worry and error monitoring should be established.
- Similar results should be demonstrated using different experimental tasks to induce ERN.