

# The Effect of PTSD on Reward-Based Effort

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## Introduction

- PTSD is associated with neurological and subjective deficits in anticipatory and consummatory reward processing.<sup>1</sup>
- Behavioral measures of reward such as reward-based effort, an indicator for motivation, have yet to be explored in PTSD.
- In depression, anhedonia is linked to decreased reward-based effort, and it may play a similar role in PTSD.<sup>2-4</sup>
- The impact of PTSD on behavioral mechanisms of effort and motivation may have implications for future treatments.
- Since insomnia and depression are related to both PTSD and reward-based effort, they must be accounted for to isolate the direct relationship between PTSD and reward-based effort.<sup>4-6</sup>

## Hypothesis

There exists a negative relationship between PTSD severity and reward-based effort, with increases in PTSD severity predicting decreases in effort, when accounting for depression and insomnia severity.

## Methods

- Data was collected from Dr. Elaine Boland's "The Role of Effort Discounting in the Link between Insomnia and Depression" study at the Corporal Michael J. Crescenz Department of Veterans Affairs Medical Center (CMCVAMC). This study was approved by the CMCVAMC IRB.
- Data was taken from 78 veterans (Mean age: 47.82 [std dev: 11.32]; 60.94% male)
- Measures
- Reward-based effort: proportion of hard choices on the Effort Expenditure for Reward Task (EEfRT)<sup>7</sup>
- PTSD severity: PTSD Checklist for the DSM-5<sup>8</sup>
- Insomnia severity: Insomnia Severity Index<sup>9</sup>
- Depression severity: Patient Health Questionnaire<sup>10</sup>

	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
<b>(Constant)</b>	0.589	0.137			4.289	0.000
<b>PTSD</b>	0.003	0.002	0.274		1.396	0.167
<b>Insomnia</b>	-0.010	0.006	-0.258		-1.594	0.115
<b>Depression</b>	-0.008	0.007	-0.195		-1.048	0.298

Figure 1: Estimated model coefficients and significance for predicting reward-based effort from PTSD (independent of insomnia and depression)

		Effort	PTSD	Insomnia	Depression
<b>Effort</b>	Correlation	1	-0.048	-0.198	-0.136
	Significance		0.678	0.082	0.235
<b>PTSD</b>	Correlation	-0.048	1	<b>0.695</b>	<b>0.782</b>
	Significance	0.678		<b>0.000</b>	<b>0.000</b>
<b>Insomnia</b>	Correlation	-0.198	<b>0.695</b>	1	<b>0.647</b>
	Significance	0.082	<b>0.000</b>		<b>0.000</b>
<b>Depression</b>	Correlation	-0.136	<b>0.782</b>	<b>0.647</b>	1
	Significance	0.235	<b>0.000</b>	<b>0.000</b>	

Figure 2: Pearson's correlation coefficients and significance of correlations between effort, PTSD severity, insomnia severity, and depression severity. Significant correlations are highlighted in blue.

## Results

- In a multiple regression analysis (see Figure 1), there was no significant association between PTSD severity and reward-based effort ( $p=0.167$ ).
- A multiple regression also showed no significant relationship between insomnia or depression severity and reward-based effort ( $p=0.115$ ;  $p=0.298$ ).
- A Pearson correlation (see Figure 2) found significant relationships between PTSD, insomnia, and depression.

## Discussion

- The data does not support the hypothesis, as there was no significant relationship between PTSD and reward-based effort, even when accounting for insomnia and depression severity.
- The results are inconsistent with prior research proving the links between depression, insomnia, and reward-based effort.
- The results do support previous evidence showing the comorbidity between PTSD, insomnia, and depression.
- Future research should test alternative scorings of the EEfRT, as this study only looked at one interpretation of this task.

## References

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