

Attentional Control Moderates Influence of Rumination on Attention during Negative Affect

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Abstract

The present study sought to examine the influence of cognitive control and rumination styles on the ability to attend to negative information while under stress, while varying levels of arousal. In an RSVP task, after having attended to a negative target, participants were less accurate at detecting a second target in the first 300ms if they were sad than if they were fearful. This performance deficit was even greater for individuals who have low attentional control and tend to ruminate. This implies that executive functioning may underlie the impact of rumination, in that it is not rumination alone but something about an individual's ability to focus attention in combination with rumination that makes the difference.

Introduction

Theories of cognitive vulnerability to psychopathology have been guided by individual differences in susceptibility to negative affect and their influence on attention (Dalgleish & Power, 1999; Ingram, Atchley, & Segal, 2011). One such construct, rumination, is apparent in individuals suffering from depression in both onset and maintenance phases.

Attempts to understand the mechanisms underlying rumination have implicated difficulties in inhibition and executive control (De Lissnyder et al., 2012; Joormann & Gotlib, 2010). The findings of De Lissnyder (2012) and colleagues demonstrated that cognitive control deficits predict rumination and subsequently depressive symptoms. Joormann and Gotlib (2010) showed that the cognitive control deficits present in depression are specifically linked to an inability to inhibit attention to negative information. In the present study, we sought to examine the influence of cognitive control and rumination styles on the ability to attend to negative information while under stress.

Understanding the attentional biases of depression has been somewhat problematic possibly because individual differences in attentional control and negative affect are often confounded with arousal. In a recent study looking at the influence of arousal on attention across time, while controlling for negative affect, we demonstrated that negative affect coupled with low arousal resulted in significantly poorer performance on an RSVP task than in a high arousal condition (Saxton, Siyaguna, Murphy, Myhre, & Rokke, 2013). Since arousal seems to be an important variable in attention and most studies of rumination are conducted without the consideration of arousal, we sought to determine how attentional control and rumination are related to attention in the context of varying levels of arousal.

References

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- De Lissnyder, E., Koster, E. H. W., Goubert, L., Onraedt, T., Vanderhasselt, M. A., & De Raedt, R. (2012). Cognitive control moderates the association between stress and rumination. *Journal of Behavior Therapy and Experimental Psychiatry*, 43(1) 519-525. doi: 10.1016/j.jbtep.2011.07.004
- Ingram, R. E., Atchley, R. A., & Segal, Z. V. (2011). *Vulnerability to depression: From cognitive neuroscience to prevention and treatment*. New York, NY US: Guilford Press.
- Joormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition & Emotion*, 24(2), 281-298.
- Saxton, B., Siyaguna, T., Murphy, J., Myhre S., & Rokke, P. (2013). Arousal level within negative affect influences the attentional blink.

Methods

Participants

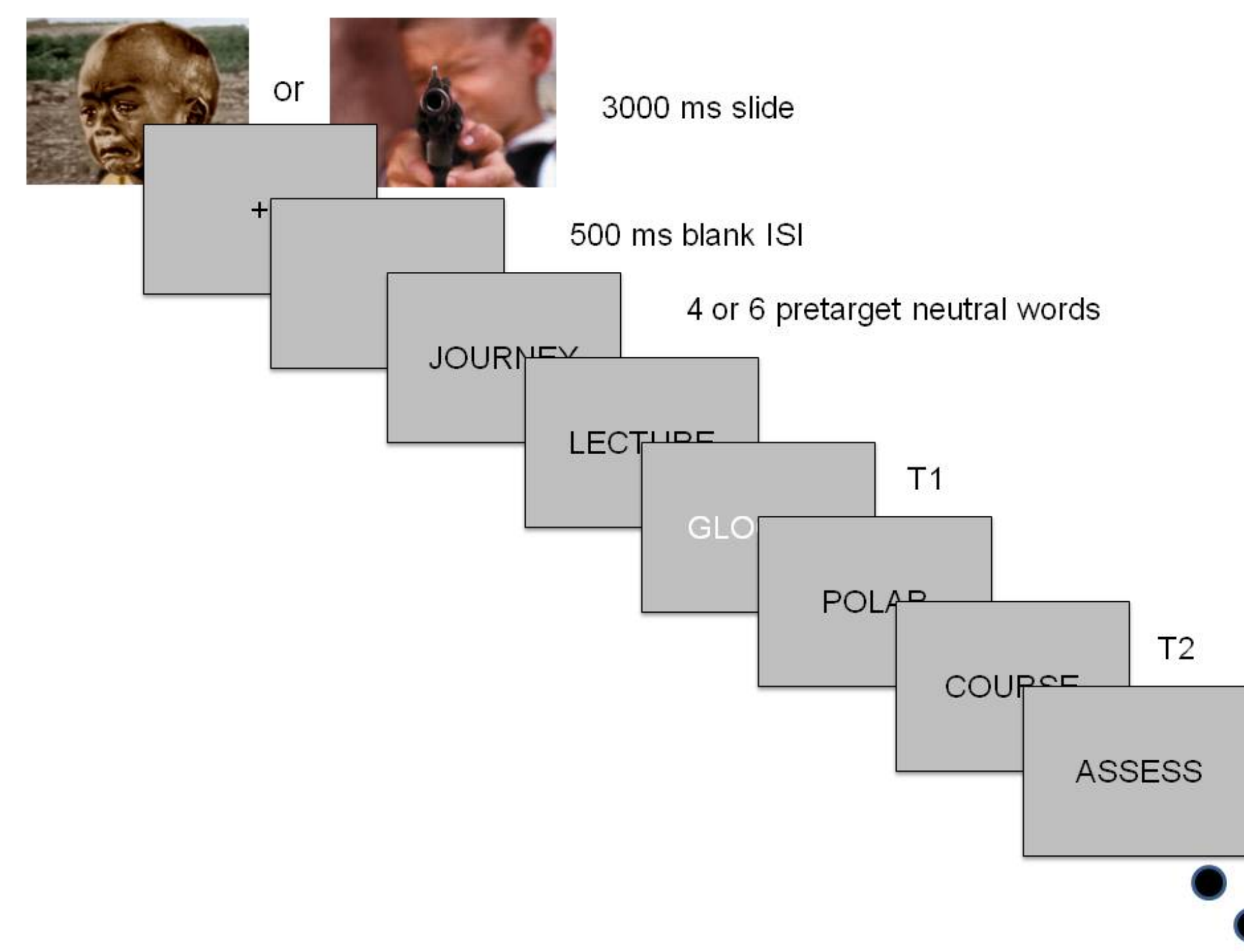
- 30 NDSU undergraduates
- 21 women, 9 men
- Age ranged from 18 to 30 ($M = 19.90$, $SD = 3.09$)
- Participated in exchange for class credit

Procedure

Participants completed an RSVP attention task while experiencing negative emotion under both low and high arousing conditions. The first target (T1) was always negative in valence and T2 was neutral. In addition, they completed measures of individual differences including the Attentional Control Scale (ACS) and the Rumination Styles Questionnaire (RSQ). A single variable indicating performance on an attention task was calculated by subtracting the depth of the attentional blink (AB) of the low arousal condition from the high arousal condition. The depth of the AB in each condition was calculated by subtracting T2 detection rates at position 2 (200ms lag) and position 3 (300ms lag) following the first target from performance at position 8 (800ms lag) and averaging them.

- Compute from T2: $(P8-P2 + P8-P3)/2$ for both conditions
- $AB\ Difference = High\ Arousal\ Condition - Low\ Arousal\ Condition$

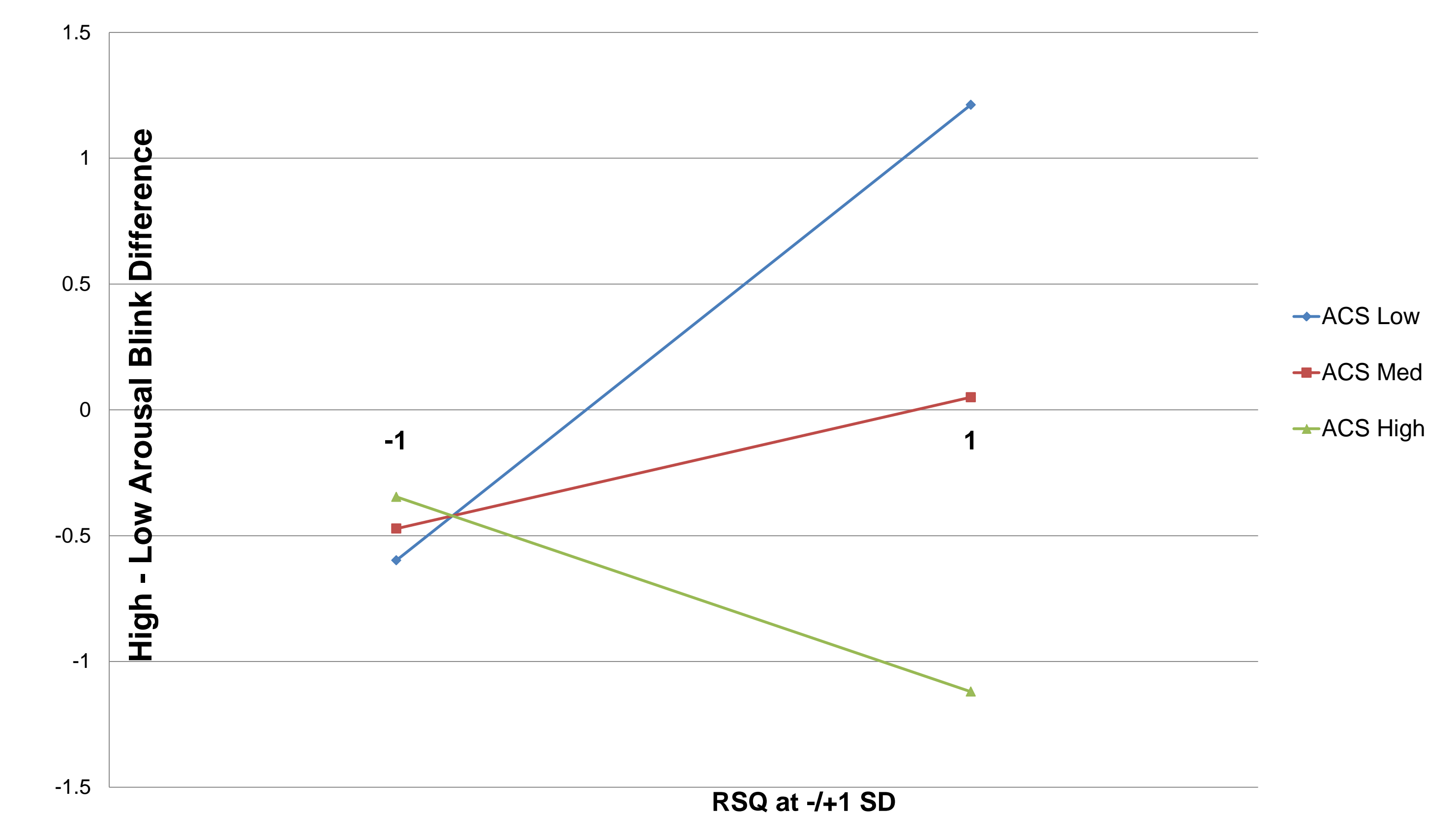
An example of a typical trial experienced by a participant:



Results

A linear regression analysis was conducted in which the AB difference score was predicted from the ACS, the RSQ, and their interaction. All variables were centered. The overall model was significant, $R^2 = .252$, $F(3,29) = 2.92$, $p = .05$. The ACS ($Beta = -.265$, $t = -1.52$, $p = .14$) and the RSQ ($Beta = .135$, $t = -.78$, $p = .44$) were not significant predictors, but their interaction was ($Beta = -.399$, $t = -2.34$, $p = .027$). A simple slopes analysis revealed that the prediction of attention performance by the RSQ was moderated at low levels of the ACS ($p = .03$), but not at moderate, or high levels ($ps > .40$).

Attentional Control Moderates Influence of Rumination on RSVP Performance



Conclusions

- The combination of low attentional control and high rumination predicted a significantly larger difference in performance between low and high arousal conditions.
- The ability to detect a second target following attention to a negatively valenced target showed greater disruption for those who are high ruminators and have low attentional control.
- Previous research has suggested that rumination is associated with poor inhibition of negative information. These data suggest that it may not be rumination per se, but rather rumination coupled with difficulties in executive functioning that make some individuals more vulnerable under emotional conditions.