

Selective Attention More Discriminating Under Negative Affect than Positive

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Abstract

Congruence between emotional states and stimuli has been shown to result in unique attentional processing, though studies have rarely compared different types of affect or levels of arousal. In an RSVP experiment that varied both affective valence and level of arousal, it was determined that when experiencing positive affect, participants were not differentially sensitive to emotional stimuli. In contrast, when experiencing negative affect, participants were more sensitive to negative and neutral stimuli than positive. Level of arousal did not influence performance.

Introduction

It has been shown that attention is influenced by emotion (Anderson, 2005; Arnell, Killman, & Fijavz, 2007; Grafton, Watkins, & MacLeod, 2012). Some studies have looked at the way that emotional states influence attention while others have looked at the way that emotional stimuli are differentially processed. It appears that there may be unique attentional processing when attending to stimuli that are congruent with an emotion being experienced. For example, a study by Koster and colleagues (2009) found that depressed individuals were less able to identify subsequent words after attending to a negatively valenced word compared to neutral or positive, while a study by Lystad and colleagues (2009) found that anxious individuals were faster to identify subsequent words after attending to an anxious word compared to neutral.

To further examine the influence of emotional congruence on attention, this study aimed to compare different types of affect and levels arousal while participants identified targets of varied affective valence.

Methods

Participants

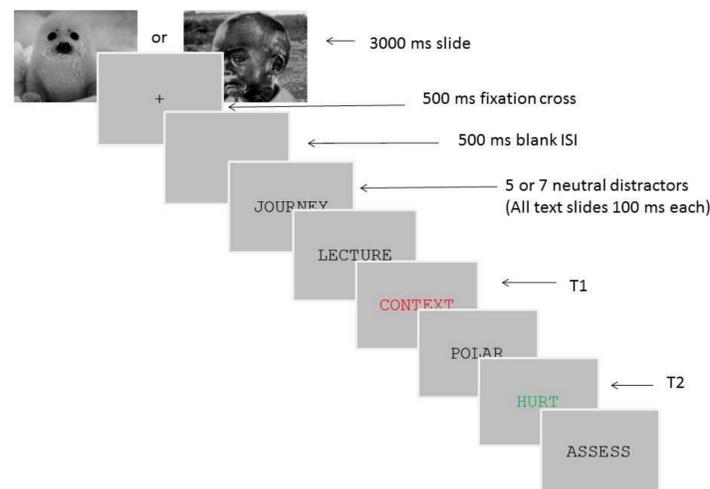
- 33 NDSU undergraduates
- 16 women, 17 men
- Age ranged from 18 to 21 ($M = 19.03$, $SD = 0.98$)
- Participated in exchange for course credit

Procedure

A 2 (affective valence: positive vs. negative) x 2 (arousal: low vs. high) x 3 (target valence: positive vs. neutral vs. negative) x 3 (T2 position) within subjects design was used. A dual-task version of the RSVP paradigm with the participant experiencing contentment, excitement, sadness, or fearfulness was used. The first target (T1) was always a neutral word. The second target (T2) was either positive, neutral, or negative depending on the condition. Trial by trial emotions were induced in participants by showing a picture from the IAPS (Bradley & Lang, 1999) immediately prior to the start of each RSVP stream and by playing emotionally relevant music throughout each block of trials. Both pictures and target words were selected for their mean ratings of pleasure and arousal.

Each trial consisted of first presenting a black fixation cross for 500 ms in the center of the screen. Following that was a 500 ms blank interval before the start of the RSVP stream. Five or seven neutral distractor words were presented prior to T1, which was always a neutral word and presented in red font. T2 was a positive, neutral, or negative word presented in green font at 200, 300, or 700 ms following T1. Following the RSVP stream the participant was first asked to indicate which of three options was presented as T1. Then the participant was asked to indicate which of three options was presented as T2. The next trial began immediately after responding to this question.

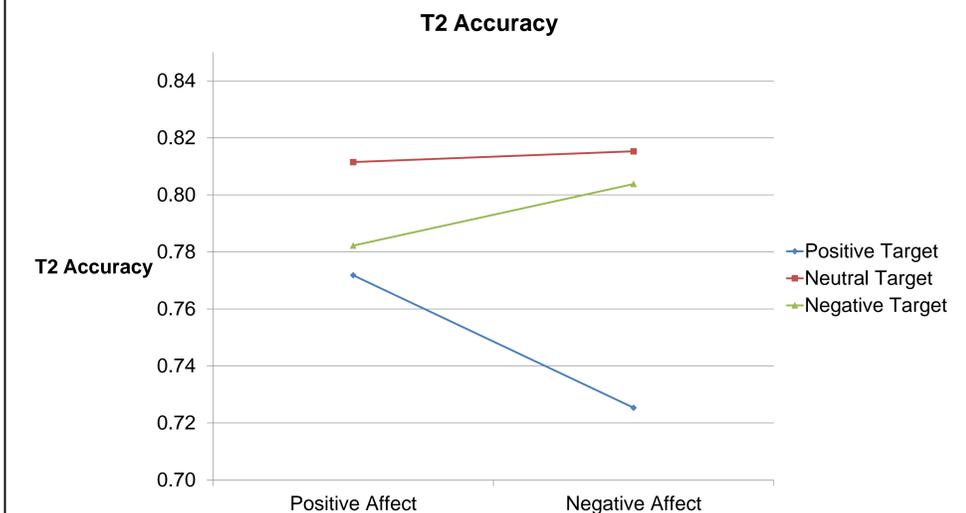
An example of a typical trial experienced by a participant would look like this:



Results

The primary dependent measure was the accuracy of T2 detection contingent on accurate identification of T1. A repeated measures ANOVA revealed a significant main effect for T2 position, $F(2, 32) = 82.18$, $p < 0.001$ indicating the presence of the typical attentional blink. There was a significant interaction between affective valence and the target valence $F(2, 31) = 7.98$, $p = 0.002$. Post-hoc analyses indicated that when participants were experiencing negative affect, they were significantly more accurate at detecting neutral, $t(32) = 2.82$, $p = 0.007$ and negative targets, $t(32) = 2.01$, $p = 0.049$, in comparison to positive targets. All other accuracy comparisons resulted in a $p > 0.05$.

The graph below demonstrates T2 performance collapsed across positive and negative mood states.



Conclusions

- In a dual attention task, when experiencing positive affect, participants were not differentially sensitive to stimuli of all emotional qualities whereas when experiencing negative affect participants were more sensitive to negative and neutral stimuli than positive.
- The results of this study did not reveal any influence for arousal, and while it did reveal an emotion congruence influence for valence, it was only under negative affect conditions.

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