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Facial expression movement enhances the measurement of temporal dynamics of attentional bias in the dot-probe task

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The facial dot-probe task is one of the most common experimental paradigms used to assess attentional bias toward emotional information. In recent years, however, the psychometric properties of this paradigm have been questioned. In the present study, attentional bias to emotional face stimuli was measured with dynamic and static images of realistic human faces in 97 college students (63 women) who underwent either a positive or a negative mood-induction prior to the experiment. We controlled the bottom-up salience of the stimuli in order to dissociate the top-down orienting of attention from the effects of the bottom-up physical properties of the stimuli. A Bayesian analysis of our results indicates that 1) the traditional global attentional bias index shows a low reliability, 2) reliability increases dramatically when biased attention is analyzed by extracting a series of bias estimations from trial-to-trial (Zvielli, Bernstein, & Koster, 2015), 3) dynamic expression of emotions strengthens biased attention to emotional information, and 4) mood-congruency facilitates the measurement of biased attention to emotional stimuli. These results highlight the importance of using ecologically valid stimuli in attentional bias research, together with the importance of estimating biased attention at the trial level.

Keywords: attentional bias, dot probe, reliability, dynamic stimuli, faces, emotions, individual differences

1. Introduction

Biased attentional processing is often measured with the dot-probe task using emotional stimuli (MacLeod, Mathews, & Tata, 1986). The facial dot-probe task, in particular, is considered one of the most important paradigms in attentional bias research. It requires the simultaneous presentation of two faces (*e.g.*, one sad, one neutral) for a brief duration. After offset, a probe appears with equal probability at the location of one of the two faces. An attentional bias toward emotional information is revealed by relatively faster responses to probes replacing expressive faces than to probes replacing neutral faces. But is the emotional dot-probe task adequate for measuring biased selective attentional processing?

1.1. Attentional biases to emotional information

An attentional bias derived from the dot-probe task has been reported in clinical samples and in non-clinically anxious individuals, but much less frequently in depression (Mogg & Bradley, 2005) and in typical non-clinical individuals (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van Ijzendoorn, 2007). Some studies have reported an attentional bias away from emotional faces (Mansell, Clark, Ehlers, & Chen, 1999; Heuer, Rinck, & Becker, 2007) whereas other studies have reported an attentional bias toward emotional faces (see Yiend, Barnicot, &

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