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Time-course of attention for threatening pictures in high and low trait anxiety

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Abstract

Cognitive studies about anxiety suggest that the interplay between automatic and strategic biases in attention to threat is related to the persistence of fear. In the present study, the time-course of attention to pictures with varying threat levels was investigated in high trait anxious (HTA, $n = 21$) and low trait anxious (LTA, $n = 22$) students. In a visual probe detection task, high and mild threat pictures were presented at three durations: 100, 500, and 1250 ms. Results indicated that all individuals attended to the high threat pictures for the 100 ms condition. Differential responding between HTA and LTA individuals was found for the 500 ms condition: only HTA individuals showed an attentional bias for mild threatening stimuli. For the 1250 ms condition, the HTA individuals attended away from high and mild threat pictures. The observed pattern of differential attention to threatening pictures may explain the persistence of fear in HTA individuals.

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1. Introduction

In the last 20 years, there has been a strong interest in the cognitive processing of threat in high trait anxious (HTA) and low trait anxious (LTA) individuals. Cognitive theories about anxiety propose that HTA individuals have cognitive vulnerabilities at the level of attentive processing of

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threat that may maintain anxiety, and may even lead to the development of clinical anxiety disorders (Beck, Emery, & Greenberg, 1985; Eysenck, 1992; Williams, Watts, MacLeod, & Mathews, 1988). In particular, the interplay between automatic and strategic biases in attention to threat has been associated with the persistence of fear (Mogg & Bradley, 1998).

A prominent idea about attentional processing of threat in HTA individuals is the “vigilance–avoidance” pattern (Mathews, 1990; Mogg, Mathews, & Weinman, 1987). HTA individuals initially attend to threat, but this is often followed by attentional avoidance of threat. It has been hypothesized that this pattern of vigilance and avoidance maintains anxiety. First, the initial vigilance for threat is responsible for the frequent detection of (potential) threat in the environment, and therefore results in frequent episodes of fear and anxiety. Second, attentional avoidance may lead to a short-term inhibition of fear and anxiety, but may—ironically—lead to more fear and anxiety in the long term. Indeed, attentional avoidance is related to brief exposure to threat and interferes with habituation to threat (Rachman, 1998).

Although early cognitive models viewed attentional biases as essentially abnormal, more recent models of attention to threat (e.g., Eccleston & Crombez, 1999; Mathews & Mackintosh, 1998; Mogg & Bradley, 1998) have stressed the adaptive value of both initial attention to threat and strategic attentional avoidance. Initial attention to threat facilitates rapid response to danger and is an evolutionary hard-wired mechanism (see Öhman, Flykt, & Esteves, 2001). It is normal to direct attention to highly threatening (HT) information. Critical differences between HTA and LTA may, however, emerge when information is more ambiguous or only mildly threatening (MT). For instance, when walking through a city, big dogs may immediately attract the attention of HTA individuals, while LTA individuals will pay little attention to these animals. However, if a ferocious dog runs toward a person, barking aggressively, and showing its teeth, all individuals will immediately attend to this threat. In line with aforementioned models of threat, several studies observed that both HTA and LTA individuals selectively attended to HT pictures, and that only HTA individuals selectively attended to MT pictures (Mogg et al., 2000; Wilson & MacLeod, 2003). Other studies have repeatedly found that HTA individuals show an attentional bias toward MT information (e.g., threatening words) compared with LTA individuals (for reviews, see Mogg & Bradley, 1998; Williams et al., 1988).

In some situations, attentional avoidance of threatening stimuli may also be adaptive. Obviously, stimuli outside the laboratory that are HT *and* require prompt action will not be avoided. However, when a threatening stimulus does not require immediate responding, attentional avoidance may be a strategy to maintain goal-directed behavior (Eccleston & Crombez, 1999; Mogg & Bradley, 1998) or to regulate mood (Ellenbogen, Schwartzman, Stewart, & Walker, 2002). Whether avoidance occurs, may critically depend upon the intensity of threat. If the threat value is low, individuals may not feel the need to avert their attention from the stimulus. It is possible that only stimuli with high threat value will elicit attentional avoidance.

Research about the time-course of the vigilance–avoidance pattern has revealed mixed results, especially relating to attentional avoidance. In these studies often the visual dot probe task is used.¹ In the dot probe task (MacLeod, Mathews, & Tata, 1986), a threatening and a neutral

¹Traditionally, the emotional stroop task has been the most frequently used method to investigate attentional biases and attentional avoidance. However, results of this task cannot be unambiguously interpreted, as RTs might reflect attentional processes and/or behavioral avoidance (e.g., De Ruiter & Brosschot, 1994).

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