



Information processing biases in spider phobia: Application of the Stroop and “White Noise” Paradigm

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Abstract

The present study examines attentional and implicit memory biases in spider phobic and nonphobic participants. The results showed that spider phobics demonstrated increased interference for neutral, negative, and spider-relevant words on a computerized Stroop task. However, no group differences emerged when adjusting for differences in color-naming speed. Prior exposure to a dead spider did result in higher overall Stroop interference in spider phobics and this appeared to be mostly pronounced for spider-relevant words. Implicit memory bias for threat was examined with a noise judgment task. Participants first heard neutral and spider-relevant sentences and implicit memory for these sentences was evaluated by having participants rate the volume of noise accompanying the presentation of old sentences intermixed with new sentences. An implicit memory bias is indicated if participants rate noise accompanying old sentences as less loud than noise accompanying new sentences. No evidence was found for an implicit memory bias in spider phobics. These findings are discussed in relation to the role of information processing biases in spider phobia. © 2007 Elsevier Ltd. All rights reserved.

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1. Introduction

Cognitive theories consider information-processing biases toward threat to contribute to the development and maintenance of anxiety disorders (Beck & Clark, 1997). Several experimental paradigms have been employed to examine such processing biases. The most frequently used interference paradigm for examining attentional bias is a modification of the Stroop (1935) color-naming task (see MacLeod, 1991a, for a review). Although there are many limitations to the Stroop (i.e., potential practice effects) and there is considerable debate surrounding the exact mechanism of the Stroop effect (see MacLeod, 1991a, for a review), it has been referred to as the “gold standard of attentional measures” (MacLeod, 1992, p. 12). In the Stroop task, participants are asked to name the color in which each word is presented while ignoring the meaning of the word. In the “emotional” Stroop task, slower color naming of threat-relevant words is said to represent an attentional bias toward threat material. Studies incorporating the emotional Stroop paradigm have shown an attentional bias toward threat cues in panic disorder (McNally, Riemann, Louro, Lukach, & Kim, 1992), obsessive-compulsive disorder (OCD; Foa, Ilai, McCarthy, Shoyer, & Murdock, 1993), post-traumatic stress disorder (PTSD; McNally, English, & Lipke, 1993), social phobia (Hope, Rapee, Heimberg, & Dombeck, 1990), and generalized anxiety disorder (GAD; Mathews & MacLeod, 1985).

Color-naming interference as an indicator of attentional bias for threat has also been found in specific phobia (e.g., Lavy & van den Hout, 1993; Lavy, van den Hout, & Arntz, 1993; Watts, McKenna, Sharrock, & Trezise, 1986) with spider phobics taking significantly longer to color-name spider words than nonphobics (e.g., Martin, Horder, & Jones, 1992). The intensity of spider phobic complaints also appears to be significantly associated with the degree of color-naming interference for threat-relevant words (Van Den Hout, Tenney, Huygnes, & de Jong, 1997). Furthermore, it has been shown that the emotional Stroop interference effect for spider words in spider phobia is a function of threat rather than the emotionality of spider words (Thorpe & Salkovskis, 1997). Similar findings have also been reported with snake phobics, who take significantly longer to color-name snake words than do nonphobics (Mathews & Sebastian, 1993, Experiment 1; Wikstrom, Lundh, Westerlund, & Hogman, 2004). Although one might predict that emotional Stroop interference for threat words increases when participants are pre-exposed to the phobic stimulus, this does not appear to be the case. Immediately prior to the Stroop task, Mathews and Sebastian (1993, Experiment 2) showed phobic and nonphobic participants a covered glass tank containing a boa constrictor. The bias toward snake words seen in their first experiment (Mathews & Sebastian, 1993, Experiment 1) disappeared and there was no interference effect for snake-related words. In fact, both groups showed a general speeding of responses to all of the word groups. Mathews and Sebastian (1993) note that one possible explanation for this finding is that during fear arousal, attentional resources are deployed not to word meaning, but to the actual source of the threat (the live snake). Thus, after exposure to the snake, participants reduced their processing of the words (hence increase speed) in favor of the actual snake.

Information processing biases in anxiety disorders have also been examined with regards to explicit (conscious recollection of a previous experience) and implicit (those that occur without intention or conscious awareness) memory biases (Becker, Roth, Andrich, & Margraf, 1999; Foa, Amir, Gershuny, Molnar, & Kozak, 1997; Thorpe & Salkovskis, 2000). Studies examining explicit memory biases in anxiety disorders typically utilize free

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