Preattentive bias for snake words in snake phobia?

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Received 26 October 2002; received in revised form ; accepted 23 July 2003

Abstract

Stroop interference and skin conductance responses (SCRs) for words related to snakes, spiders, flowers, and mushrooms were studied in a group of women (n = 40) with snake phobia who were randomised to a stress or no-stress condition. The 21 low-stress snake phobics showed Stroop interference for unmasked (but not for masked) snake words, compared with 21 age- and sex-matched controls. Stroop interference was not significantly different between high-stress and low-stress snake phobics. No support for stronger SCRs for masked snake words was found in snake phobics in a lexical decision task with masked presentations of the same words. The lack of a masked Stroop interference in snake phobics suggests a possible difference in cognitive–emotional mechanisms underlying specific phobia vs. other anxiety disorders that deserves further investigation.

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Keywords: Preattentive bias; Emotional Stroop task; Specific phobia; SCR; Masked words

1. Introduction

Several lines of research exist concerning preattentive mechanisms involved in anxiety and anxiety disorders. Cognitive approaches in experimental psychopathology have mostly relied on indirect behavioural measures of information-processing as for example reaction time, whereas behaviourally oriented theorists have focused on measures of physiological arousal like skin conductance responses (Öhman, 1997; Öhman & Soares, 1994). This study aimed at combining...
these two approaches by studying information processing, as well as physical arousal for masked threat stimuli in individuals suffering from snake phobia. Theories propose that atten-
tional, as well as preattentive biases for threatening information are contributing to and/or
maintaining a range of anxiety disorders (Williams, Watts, MacLeod, & Mathews, 1997). One
common method in this area is the emotional Stroop paradigm (for an overview, see Williams,
Mathews, & MacLeod, 1996; Williams, Watts, MacLeod & Mathews, 1997).

In the computer-based emotional Stroop task, the participant is required to report the colour
of a word that appears on a computer screen as fast as possible, while ignoring the meaning of
the word. Words with threatening content have been shown to increase colour-naming latencies
in anxious individuals and this so called ‘Stroop interference’ is presumed to reflect an auto-
matic tendency to attend to (or an inability to let go of) threatening information. Preattentive
Stroop interference involving masked words has been shown in clinical anxiety patients with dif-
ferent diagnoses (Bradley, Mogg, Millar, & White, 1995; Harvey, Bryant, & Rapee, 1996;
Lundh, Wikström, Westerlund, & Öst, 1999; Mogg, Bradley, Millar, & White, 1995; Mogg,
Bradley, Williams, & Mathews, 1993), as well as having associations with trait anxiety in non-
clinical samples (MacLeod and Hagan, 1992; MacLeod and Rutherford, 1992; Mogg, Kentish,

With regard to specific phobias, to our knowledge only one study has so far found Stroop
interference for masked threat words. This was found with regard to spider words in spider pho-
bics (van den Hout, Tenney, Huygens, & de Jong, 1997), whereas negative results have also
been reported in one study (Thorpe & Salkovskis, 1997). Non-masked Stroop interference, on
the other hand, has reliably been shown in spider phobic adults (Kindt & Brosschot, 1997;
Kindt & Brosschot, 1998; Thorpe & Salkovskis, 1997), as well as in children suffering from spi-
der phobia (Kindt, Bierman, & Brosschot, 1997; Kindt & Brosschot, 1999), although children’s
Stroop interference failed to differentiate between phobic and non-phobic controls in these stud-
ies. In summary, the evidence of Stroop interference involving individuals suffering from specific
phobia using unmasked presentation of words seems consistent, while the results with regard to
masked Stroop interference for threat words in this population are still inconclusive and need
further investigation.

1.1. Skin conductance responses to masked stimuli

In another line of research, threatening pictorial stimuli that were shown at a preattentive
level of awareness have been shown to elicit skin conductance responses in spider- and snake-
fearful students (Öhman and Soares, 1994; but see also Mayer, Merckelbach, & de Jong, 1999,
with comments by Öhman, 1999). This preconscious fear response is thought of as genetically
‘prepared’ through evolution in a way that enables fear conditioning for certain classes of aver-
sive stimuli (angry faces, snakes, spiders) even in the absence of conscious awareness of the
stimuli and being advantageous for surviving in life-threatening situations (for a review, see
Öhman, 1997). Öhman’s model concerning fear and anxiety implies that only a limited range of
threatening stimuli may be physiologically arousing when exposed at a level below conscious
awareness. Because it can be argued that reading is a learned skill entering rather late in human
development (both ontogenetically and phylogenetically), it might be expected that threatening
linguistic stimuli are less likely to evoke autonomic responses at a preattentive level.
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