



Neuroticism and avoidance of ambiguous stimuli: Better safe than sorry?

Miriam J.J. Lommen*, Iris M. Engelhard, Marcel A. van den Hout

Clinical and Health Psychology, Utrecht University, The Netherlands

ARTICLE INFO

Article history:

Received 9 April 2010

Received in revised form 4 August 2010

Accepted 11 August 2010

Available online 9 September 2010

Keywords:

Neuroticism

PTSD

Anxiety disorders

Information processing

Cognitive

ABSTRACT

Neuroticism predisposes to anxiety disorders, but the precise pathogenic mechanism is unknown. The aim of this study was to examine whether people with high neuroticism scores use a lower criterion for detecting danger in the face of ambiguous stimuli, and avoid a greater number of ambiguous stimuli than people with low neuroticism scores. Participants high and low in neuroticism were administered a differential conditioning task, in which one conditioned stimulus (CS+; colored circle) was followed by an electric shock (unconditioned stimulus; UCS), whereas another stimulus (CS−; different colored circle) was not. After this acquisition phase, degraded colored circles on a continuum between CS+ and CS− were presented and could be avoided by the participants within a latency of 1 or 5 s. Results indicated that the high neuroticism group avoided more degraded stimuli than the low neuroticism group, but only at the 5 s latency trials. The absence of differences at the 1 s latency trials suggests the involvement of a strategic process. Apparently, when confronted with ambiguous threat signals, people high in neuroticism use a better safe than sorry strategy. By preventing disconfirmation of irrational fears, this strategy may be involved in the development and maintenance of anxiety disorders.

© 2010 Elsevier Ltd. All rights reserved.

1. Introduction

Neuroticism involves a trait sensitivity to negative stimuli: individuals high in neuroticism are more likely to report distress, discomfort, and dissatisfaction over time, regardless of the situation, even in the absence of any overt or objective source of stress (Clark, Watson, & Mineka, 1994; Watson & Clark, 1984). Neuroticism, trait anxiety, and negative affectivity show strong intercorrelations (Watson & Clark, 1984), and refer to a similar construct that is associated with affective disorders, including posttraumatic stress disorder (PTSD: Bowman, 1999; Breslau, Davis, Andreski, & Peterson, 1991; Cox, MacPherson, Enns, & McWilliams, 2004). One of the possible explanations for this relation is that high neuroticism individuals are more *reactive* to adverse events than low neuroticism individuals. To test this hypothesis, prospective studies are needed in which pre-event stress symptoms are assessed.

A study by Engelhard, van den Hout, and Kindt (2003) provides prospective data of a sample of pregnant women, who completed questionnaires during their early pregnancy to assess neuroticism and 'baseline' arousal symptoms. About 9% of the participants subsequently had a pregnancy loss. Results showed that neuroticism in early pregnancy significantly predicted PTSD symptoms one month after the loss. Yet this relationship disappeared when

controlling for pre-trauma arousal symptoms: the *increase* in PTSD symptoms from baseline to post-pregnancy loss was similar for high and low neuroticism individuals. Thus, high neuroticism individuals did not show heightened reactivity to adverse events. These results were recently replicated in a prospective study of soldiers who were exposed to adverse events during their deployment in Iraq (Engelhard, van den Hout, & Lommen, 2009). High neuroticism individuals reported more PTSD symptoms than low neuroticism individuals after deployment, but this was also the case before deployment; the increase in symptoms was similar for both groups. In conclusion, high neuroticism individuals were not more reactive to stressful events than low neuroticism individuals. The question is what underlying mechanism may be responsible for the heightened level of (baseline) distress in high neuroticism individuals. As stated by Ormel, Rosmalen and Farmer (2004), since neuroticism itself does not seem to have an explanatory role in the etiology of anxiety disorders, it is important to unravel cognitive and biological mechanisms that may produce high neuroticism.

Many studies have focused on information processing abnormalities that may play a role in the etiology of anxiety disorders. High, compared to low, trait anxiety individuals show selective processing of both threatening and ambiguous stimuli (see Eysenck, MacLeod, & Mathews, 1987). One of the selective processes in (clinical) anxiety includes attentional bias towards threatening stimuli (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007). Selective attention may lead to excessive processing of minor threats in daily life, resulting in

* Corresponding author. Address: Clinical and Health Psychology, Utrecht University, Heidelberglaan 1, P.O. Box 80140, 3508 TC Utrecht, The Netherlands. Tel.: +31 30 253 9308; fax: +31 30 253 4718.

E-mail address: m.j.lommen@uu.nl (M.J.J. Lommen).

anxiety even in conditions that are innocuous (Watson & Clark, 1984). Furthermore, high (trait) anxiety is associated with interpretation biases, which refers to the tendency to interpret ambiguous stimuli as threatening (Calvo & Castillo, 2001; Eysenck et al., 1987), and judgmental bias, the tendency to overestimate the likelihood of negative outcomes and their costs (Butler & Matthews, 1983; Eysenck & Derakshan, 1997). These findings suggest that high trait anxious individuals may use a lower decision criterion to detect danger in potentially threatening situations. In terms of the signal detection theory, they may be reluctant to miss a danger-signal, but willing to accept a false alarm. As everyday life involves many uncertain situations, such a better safe than sorry strategy should cause many false alarms. Especially if false alarms are followed by avoidance or escape, the inaccuracy of the alarm will not be detected, and this may help to explain why negativity is so persistent. The aim of this study was to investigate whether high compared to low neuroticism individuals avoid a greater number of ambiguous stimuli.

Although several studies have focused on processing of ambiguous stimuli in high trait anxiety, studies that used a behavioral outcome variable such as avoidance of potentially threatening stimuli are scant. Moreover, most studies used stimuli of which ambiguity was assumed, and not established. To withstand these problems, this study uses a *de novo* conditioning task (based on Orr et al., 2000). In this task, two different neutral, conditioned stimuli (CS; i.e., colored circles) are presented in random order. In an acquisition phase, one stimulus (CS+) is always followed by an aversive, unconditioned stimulus (UCS; i.e., a mild electric shock), the other stimulus (CS-) is not. After a few presentations, a person generally learns that the CS+ predicts the UCS, and the CS- predicts the absence of the UCS. So in this phase, both a threat and a non-threat signal are learned. Following the acquisition phase, we did not immediately use an extinction phase, but introduced an 'avoidance' phase, that included degraded stimuli, with different color values on a spectrum between CS+ and CS- (see Fig. 1). In this phase, a potential UCS could be avoided by pushing the spacebar before the offset of the stimulus.

We hypothesized that (1) high compared to low neuroticism individuals would avoid more stimuli, and that (2) the mean color value of avoided stimuli would be closer to the color value of CS- for high neuroticism individuals. Moreover, we explored whether the expected effects (1 and 2) might be partially explained by differences in UCS-expectancy or in subjective aversiveness of the UCS. We also explored whether the expected effects would be more pronounced in short or long latencies (i.e., 1 or 5 s), which may indicate whether relatively automatic or more elaborative, strategic processes (see Schneider & Shiffrin, 1977) are involved. Finally, to gain insight in processes that might be responsible for the effects, state anxiety, intolerance of uncertainty, anxiety sensitivity, and worry were assessed, because these variables are associated with neuroticism (e.g. De Bruin, Rassin, & Muris, 2007) and/or individual differences in conditioning (Otto et al., 2007).

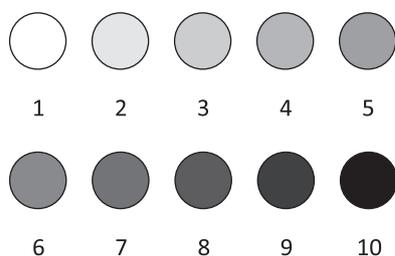


Fig. 1. CSs and corresponding color values.

2. Method

2.1. Participants

A total of 55 students of Utrecht University and University of Applied Sciences enrolled in the study, based on their score on the neuroticism scale of the Eysenck Personality Questionnaire (EPQ-N; Eysenck & Eysenck, 1975). A score of 4 or less was considered to reflect low neuroticism (N-; $n = 24$; 12 females), and 11 or higher to reflect high neuroticism (N+; $n = 24$; 13 females). Exclusion criteria were (1) past or current psychiatric disorders, (2) visual problems (unless corrected), (3) color blindness, (4) use of medication or drug that could interfere with attention, reaction time and/or memory, (5) epilepsy, (6) heart condition, and (7) current pregnancy. Students received course credit or financial compensation for their participation.

2.2. Stimulus materials

A set of 10 colored circles (Fig. 1) was used in the conditioning task, which ranged from white (No. 1) to black (No. 10). The red, green, blue (RGB) values of the white circle were 255–255–255, and the RGB values of the black circle were 0–0–0. To increase ambiguity, two circles were used as CS+ (Nos. 1 and 2) and two were used as CS- (Nos. 9 and 10). The degraded grey colors (Nos. 2–9) were equally divided over the RGB spectrum. CSs had a diameter of 176 mm and were presented on a 1280×1024 resolution screen (Eizo flexscan S1911). The UCS consisted of a mild electric shock, delivered via finger electrodes to two fingers of the non-dominant hand. It was adjusted individually to a level that was 'highly annoying but not painful' through a work-up procedure (cf. Orr et al., 2000).

2.3. Procedure

The study took place in a humidity- and temperature-controlled, sound-attenuated room. First, exclusion criteria were checked with an interview, and color blindness was tested with the Ishihara Test (Ishihara & Ishihara, 1970). If individuals met the inclusion criteria, informed consent was obtained. Then the work-up procedure to determine the UCS level was carried out, followed by a filler questionnaire, the STAI-S (see below), and the conditioning task, which contained the following phases:

2.3.1. Habituation phase

CS+ No. 1 and CS- No. 10 were each presented five times in a semi-random order, with no more than two consecutive presentations of the same CS. CS duration was 4 or 5 s, determined randomly, with an Inter Trial Interval (ITI) of 7 ± 2 .

2.3.2. Acquisition phase

CS+ trials (Nos. 1 and 2) and CS- trials (Nos. 9 and 10) were each presented five times semi-randomly as described before. All CS+ trials were followed by the UCS, whereas none of the CS- trials were. CS duration was 4 or 5 s, determined randomly, with an ITI of 7 ± 2 . UCS-expectancy was measured with a 0–100 visual analogue scale (VAS). Participants were asked to rate this scale at least once during CS presentation.

2.3.3. Avoidance phase

Stimuli Nos. 3–10 were semi-randomly presented as described before. Participants were instructed that if a yellow or white light was shown before stimulus onset, they had the opportunity to avoid a potential UCS by pushing the spacebar. The yellow light indicated that the participant had 5 s to avoid a potential UCS,

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات