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Short report

Assessment of automatic associations with bodily sensations and agoraphobic situations in panic disorder

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ABSTRACT

Background and objectives: One of the central assumptions of cognitive models of Panic Disorder (PD) is that automatic panic-related associations are a core feature of PD. However, empirical findings are mixed and inconsistent, rendering it difficult to evaluate the role of panic-related associations adequately, particularly in relation to the relevant theories. The present study aimed to further advance our understanding of automatic associations in PD, and therefore applied a paradigm novel in this context, namely an Extrinsic Affective Simon Task (EAST).
Methods: Participants involved treatment seeking, unmedicated panic patients (n = 45) and healthy controls (n = 38). The EAST was applied prior to treatment. It included the following stimuli as targets: panic-related bodily sensations and agoraphobia-related situations, and as attributes: pleasant versus unpleasant, fear-related words.
Results: Contrary to our expectations, panic patients did not show stronger negative than positive automatic associations for either panic-related symptoms or agoraphobia-related situations, compared to healthy controls. Moreover, EAST effects did not correlate with panic-related self-report measures.
Limitations: Although the present study involved patients who were actively seeking treatment, panic-related associations might not have been activated sufficiently. Hence, a brief activation procedure (e.g., hyperventilation) might have been needed to optimize the assessment condition.
Conclusions: The present findings do not support contemporary theories of panic-related associations. Therefore, follow-up work is needed to disentangle their functional and operational properties more thoroughly.

1. Introduction

A central assumption of cognitive models of Panic Disorder (PD) (e.g., Beck, Emery, & Greenberg, 1985; Clark, 1986) is that panic-related associations lie at the heart of PD: They are activated at a very early stage of information processing and occur automatically, i.e., they are activated quickly, unintentionally, and without the individual's control. To illustrate, a PD patient who notices an increase in heartbeat automatically associates this benign bodily sensation with something alarming, resulting in a catastrophic misinterpretation of that sensation (e.g., a heart attack). This is followed by an amplification of bodily sensations, which in turn triggers anxiety and very likely results in a full-blown panic attack. Theoretically, automatic associations are the crucial element here because they explain a patient's inability to deactivate this vicious circle. Furthermore, automatic associations could account for some patient's therapy resistance or relapse. Most interventions target explicit cognitions and this might not necessarily impact automatic associations.

Priming tasks are frequently used reaction time (RT) paradigms to study automatic panic-related associations. Such tasks involve the (brief) presentation of a prime (e.g., a word), followed by a target requiring a response (e.g., categorization). The RT needed to respond to the target serves as an index of the 'associative match', i.e., the prime can either facilitate or aggravate reactions and thereby decrease or increase RTs. To illustrate, the priming study by

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Schniering and Rapee (1997) included associatively related and associatively unrelated prime–target pairs, which participants had to categorize as 'words' or 'non-words'. Most relevant were trials where primes referred to bodily sensations and targets to catastrophic outcomes (e.g., breathlessness-suffocate; dizzy-faint). Contrary to predictions of PD models, there was no difference in RTs between panic patients and controls on panic trials (see also Schneider & Schulte, 2007; McNally, Hornig, Otto, & Pollack, 1997). To the best of our knowledge, the study by Hermans et al. (2010) is the first to show the expected pattern, i.e., a faster RTs for panic trials in panic patients than in controls.

Another paradigm is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Here, participants sort stimuli (e.g., words) into four categories by means of two response keys: two categories represent a target concept, (e.g., me vs. not me) and two categories represent two poles of an attribute dimension (e.g., panicked vs. calm). Each target category is paired with both attributes. As such, faster RTs during a particular target–attribute combination suggest a strong association between the two stimuli. To illustrate, the study by Teachman, Smith-Janik, and Saporito (2007) found that panic patients, compared to healthy controls, had stronger associations between concepts related to 'me and panicked' than between 'not me and panicked'. However, a second IAT using the concepts 'bodily changes versus body parts' and 'alarming versus meaningless' did not reveal any group differences.

To conclude, findings concerning automatic, panic-related associations are mixed. Various reasons could account for this. For example, the tested samples differed in panic-related severity, and panic-related associations might have been more accessible in those patients with more severe symptoms. Furthermore, the stimuli used differed in their ecological validity and results partly depended on analyses using idiographically selected stimuli (Schneider & Schulte, 2007). This inconsistency makes it difficult to evaluate the role of panic-related associations adequately. Hence, the present study aimed to extend previous findings by assessing automatic panic-related associations using a novel paradigm in the context of PD, namely the Extrinsic Affective Simon Task (EAST; De Houwer, 2003). During the EAST, attribute words are categorized by means of two response keys, assuming that the keys become extrinsically associated with the attributes' valence. In contrast, target words have to be categorized by means of a task irrelevant feature, (e.g., color), using the same two response keys as during attribute categorization. The associative strength is defined via the RT difference between giving a pleasant versus unpleasant response to a target (for other EAST studies, see e.g., Ellwart, Becker, & Rinck, 2005; De Raedt, Schacht, Franck, & De Houwer, 2006; Roefs, Herman, MacLeod, Smulders, & Jansen, 2005). In the present study, the EAST was applied in a sample of clinically diagnosed panic patients and healthy controls (attributes: pleasant and unpleasant words, targets: panic-related bodily sensations and agoraphobia-related situations).

Compared to previous studies, our study has a number of advantages. First, as PD does not have an inherently meaningful contrast category (which previous IAT studies needed), our critical test concerns the automatically associated valence comparison. Second, the EAST employs a task-irrelevant instruction. Hence, participants respond to stimulus features that are independent of the stimulus dimension the task aims to assess (compared to, for example, the IAT), disguising the research question and making response strategies less likely (Rinck & Becker, 2007). Third, we recruited a non-biased control group, i.e., a group that was not exposed to panic-related information, and therefore could not have obtained a panic-related bias which could impact RT effects. To illustrate, Hermans et al. (2010) control group partly included professionals working within the health service. Hence, these participants had a basic knowledge of panic-related phenomena, which could have affected the priming task's results. Given these advantages, our study offers new and advanced insights to the role of automatic associations in PD. Moreover, if successful, variations of the EAST could provide a useful starting point to systematically examine reasons that could account for the previous inconsistent findings (e.g., by comparing different sets of stimuli).

We expected panic patients, compared to controls, to show stronger negative than positive automatic associations for both panic-related symptoms and agoraphobia-related situations. Moreover, we expected the EAST effects to be correlated with panic-relevant self-report measures.

2. Methods

2.1. Participants

85 participants were tested. Two participants were excluded due to missing data (final sample: $N = 83$). There were $n = 45$ panic patients (7 male, 34 female, $M_{age} = 32$, $SD = 11$; PD without agoraphobia $n = 15$, PD with agoraphobia $n = 30$), recruited from an outpatient waiting list and diagnosed using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-CV; First, Spitzer, Gibbon, & Williams, 1996). Currently being on CNS-active medication such as antidepressants and comorbidity were exclusion criteria (Reinecke & Harmer, 2016). Patients were tested before their first treatment session. The control group included $n = 38$ participants (4 male, 32 female, $M_{age} = 31$, $SD = 11$), without current or history of psychopathology, recruited via newspapers and posters. There were no group differences in age, $t(81) = .47$, $p = .638$, or gender, $\chi^2(2) = .96$, $p = .618$.

2.2. Questionnaire measures

2.2.1. Panic disorder severity scale (PDSS; Houck, Spiegel, Shear, Rucci, & Stat, 2002)

This 7-item self-report scale measures severity of PD, assessing, for example, distress during panic attacks and panic frequency.

2.2.2. Agoraphobic cognitions questionnaire (ACQ; Chambless, Caputo, Bright, & Gallagher, 1984)

The ACQ includes 14 items and measures dysfunctional cognitions in relation to potential catastrophic consequences arising from panic or anxiety using two subscales: loss of control and physical concerns.

2.2.3. Hospital anxiety and depression scale (HADS; Zigmond & Snaith, 1983)

The HADS measures the severity of anxiety-related and depression-related symptomatology. It consists of 14 items, half of them related to anxiety and the other half to depression.

2.2.4. Trait anxiety inventory (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)

The STAI-T was used to assess trait anxiety. It comprises 20 anxiety related statements that participants rate for occurrence and frequency.

2.3. Extrinsic affective simon task (EAST)

Targets were 10 words describing panic-related bodily sensations and 10 words describing agoraphobia-related situations. Each of the target words had a blue-colored and a green-colored version. Moreover, 10 pleasant and 10 unpleasant black-colored valence