Behavior as information about threat in anxiety disorders: A comparison of patients with anxiety disorders and non-anxious controls

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ABSTRACT

Background: Gangemi, Mancini, and van den Hout (2012) argued that anxious patients use safety behaviors as information that the situation in which the safety behaviors are displayed is dangerous, even when that situation is objectively safe. This was concluded from a vignette study in which anxious patients and non-clinical controls rated the dangerousness of scripts that were safe or dangerous and in which the protagonist did or did not display safety behaviors. Patients were more likely to take safety behavior as evidence that the situation was dangerous, especially in safe situations. Their non-clinical group may not have been psychologically naïve. We critically replicated the Gangemi et al. study using a psychologically non-informed control group.
Method: The same materials were used and patients (Obsessive Compulsive Disorder, Panic Disorder, Social Phobia; $n = 30$ per sub-group) were compared to matched non-patients. Using Bayesian statistics, data from the Gangemi et al. samples and the present groups were (re-)analyzed testing the hypothesis relative to non-patients, patients infer threat from safety behaviors, especially if displayed in safe situations.
Results: The Gangemi et al. data yielded a Bayes factor of 3.31 in support of the hypothesis. The present Bayes Factor was smaller (2.34), but strengthened the support for the hypothesis expressed by an updated Bayes factor of $3.31 \times 2.34 = 7.75$.
Conclusions: The finding that anxious patients infer threat from safety behaviors, in particular in safe contexts, was corroborated, suggesting one way in which safety behaviors are involved in the maintenance of anxiety disorders.

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1. Introduction

Anxiety patients fear that an innocuous cue or situation is followed by some terrible outcome, while in fact it is not. In other domains, reality testing in patients with anxiety disorders is undisturbed and the evidence that the feared circumstances are not followed by the dreaded catastrophe is abundant. One of the major problems in the psychology of anxiety disorders is, therefore, why irrational anxiety persists. Note that, while the feared cues are not followed by catastrophes, they *are* followed, systematically, by anxiety responses. Would people take affective responding as a source of information about e.g. danger and would anxiety patients be more likely to make such "anxiety-therefore-threat" attributions?

A positive answer to the first question is provided by evidence that risk expectancies can be emotion-based (cf. Clore, 1992; Schwarz & Clore, 1988). Also physiological response information influences stimulus evaluation. For example, Davey (1987) demonstrated that, in non-clinical individuals, false physiological

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response feedback affects the expectation of danger. Moreover, Valins and Ray (1967) reported that in clinical subjects, false feedback suggesting no heart rate response to snake slides positively influenced subsequent approach to a live snake.

There is evidence that anxiety patients are more likely to use (anxious) affect as information about threat. Arntz, Rauner, and van den Hout (1995) developed written scripts of situations that started with a neutral stem and were completed in four different manners: objective danger/protagonist anxious, objective danger/protagonist non-anxious, objective safety, protagonist non-anxious and objective safety/protagonist anxious. Anxious patients and non-anxious controls were asked to rate the 4 scenario's in terms of perceived danger. Interestingly, relative to the non-patients, anxious individuals inferred danger from the anxiety experienced by the protagonist, even when the situation was objectively safe. Using the same paradigm (scripts with neutral stem, completed by 2×2 endings), it was found that, relative to healthy controls, PTSD patients inferred threat from the occurrence of trauma related intrusions (Engelhard, Macklin, McNally, van den Hout, & Arntz, 2001; see also Engelhard, van den Hout, Arntz, & McNally, 2002), while patients affected by Obsessive Compulsive Disorder (OCD) tended to use feelings of guilt affect as information that threat is increased and that preventive action is less effective (Gangemi, Mancini, & van den Hout, 2007). Thus, situations feared by anxiety patients may not be followed by misfortune, but they are followed by anxiety and the fact that patients take anxiety to indicate danger may serve to maintain anxiety disorders.

Anxiety responses not only consist of feelings and physiological arousal, but also encompass safety behaviors, defined as actions intended to detect, avoid, escape or neutralize a feared outcome (cf. Cuming et al., 2009; Deacon & Maack, 2008). Deacon and Maack (2008) tested the effects of OCD relevant safety behavior on worries about contamination. Healthy individuals engaged for two weeks in OCD relevant safety behaviors, such as hand-washing, carrying hand-sanitizer, and avoiding touching money. As a result their levels of contamination fear increased. Deacon and Maack failed to include a control group leaving it unclear if and to what extend the effects were due to matters other than the manipulation like e.g. the repeated assessment. In a conceptually similar study, Olantunji, Etzel, Tomarken, Ciesielski, and Deacon (2011), tested the effects of safety behaviors on health anxiety. Thirty healthy individuals carried out a long range of health related behaviors (washing or disinfecting hands each time after eating, avoid touching public door handles, taking daily multivitamin etc.) for a week. Compared to a no intervention control group, the experimental group ($n = 30$) reported increases in health anxiety, hypochondriacal beliefs, contamination fear and the self-reported changes were paralleled by behavior on a behavioral avoidance task (Olantunji et al., 2011).

In an attempt to more specifically study the effects of safety-seeking behavior on danger assessment, Gangemi, Mancini, and van den Hout (2012) devised an experiment largely based on the script studies described above (Arntz et al., 1995; Engelhard et al., 2001; Gangemi et al., 2007). Written scripts were developed with a neutral stem with four different completions: the scenario ended objectively safe vs. objectively dangerous, while the protagonist did vs. did not display safety behavior. Each of the four versions of the scripts were rated for dangerousness by 31 OCD patients, 22 Panic Disorder patients, 17 Social Phobics and 31 non-anxious controls. When the protagonist displayed safety behaviors, all groups tended to rate scenario's more dangerous as compared to the no-safety behavior versions, but the clinical groups were more affected by safety behavior information than the healthy control group. This was especially the case when scripts were objectively safe. The extent to which anxiety patients' danger ratings were influenced by safety-seeking behavior information was, to a certain degree, disorder-specific. That is, the danger ratings by obsessive-compulsives and social phobics, but not by panic patients, were affected more by safety-seeking behavior information when they faced a script that was directly related to their anxious concerns. Overall, this suggests that anxiety patients not only use anxious feelings as evidence for threat (cf. Arntz et al., 1995) but that the same hold true for safety behavior. This tendency to infer threat from safety behavior may serve to maintain anxiety disorders.

The clinical participants in the Gangemi et al. (2012) study were approached at the start of their treatment at a psychotherapy practice in Rome, while the non-clinical controls were recruited through advertisement at the Department of Psychology at Cagliari University. This is a potential weakness in the experiment. The healthy controls, the majority being either psychology student or staff, while matched for age, gender, and years of education, were, relative to their clinical counter-parts, possibly more knowledgeable regarding psychological research and theory. The same "behavior as information" effects observed in patients may materialize in a control group with less potential psychological sophistication.

The current study, carried out in the Netherlands, is a replication of the Gangemi et al. (2012) experiment, carried out in Italy, the main difference being that the non-clinical control group was not recruited in University circles. It was hypothesized that, relevant to the non-clinical control group, danger ratings of the anxiety patients are more affected by safety behavior displayed by the protagonists. There are two reasons to expect that this patient/control difference is especially outspoken in situations that are objectively safe. A theoretical argument is that the crucial difference between anxiety patients and others is not the fear for realistic threat but the occurrence of fear in unthreatening situation. An empirical argument is that this phenomenon (patient/control differences in effects of safety behaviors most prominent in safe situations) was indeed observed by Gangemi et al.

2. Method

2.1. Participants

Three clinical groups and one non-clinical control group took part. The clinical groups consisted of anxiety patients from the Altrecht Academisch Angstcentrum (AAA) in Utrecht, the Netherlands. Originally, 36 patients with Panic Disorder (PD), 32 patients with Social Phobia (SP), and 30 patients with Obsessive Compulsive Disorder (OCD) participated. After matching for level of education, six PD-patients and two SP-patients were excluded, leaving 30 anxiety patients in each group: 10 male and 20 female panic patients, mean age 34.7 ($SD = 10.4$); 9 male and 21 female social phobics, mean age 30.3 ($SD = 9.3$); and 15 male and 15 female obsessive-compulsives, mean age 33.3 ($SD = 11.7$). They were diagnosed during intake at the AAA, using the Structured Clinical Interview for DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 1996). All patients were at the start of their treatment when they participated in the experiment. A control group of 30 individuals (10 males and 20 females, mean age 34.7 ($SD = 13.9$)) was created using a snowball sampling procedure. Research assistants asked friends and acquaintances from non-student and non-academic circles to participate and asked these participants to ask their friend/acquaintances. As the sample increases recruitment criteria became more specific to match the demographic characteristics of the patient sample. The total sample size was $N = 120$, with a mean age of 33.2 ($SD = 11.5$). The healthy controls were matched for gender, age and level of education. To rule out the presence of any axis I disorders they were administered the abbreviated SCID. The clinical groups and non-