



# Blood-injection-injury fears: Harm- vs. disgust-relevant selective outcome associations

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## Abstract

There is increasing evidence that blood-injection-injury (BII) phobia is qualitatively different from the other specific phobias in the sense that phobic distress takes the form of disgust rather than (threat-induced) fear. Following this, we tested the relative importance of harm and disgust-related associative biases in BII-fear. High ( $n = 25$ ) and low ( $n = 27$ ) fearful individuals saw a series of fear-relevant (blood-related) and fear-irrelevant (rabbit and flower) slides which were randomly paired with either a harm-related outcome, a disgust-related outcome, or nothing. Preexperimentally, participants expected blood-related slides to be followed by both disgust- and harm-relevant outcomes. These selective preexperimental outcome expectancies were readily corrected during the experiment. Neither low nor high fearful participants showed a postexperimental covariation bias. The absence of differential effects between high and low fearful participants does not support the idea that disgust- or harm-relevant associative biases play a role in the maintenance of BII-fears. The results corroborate the previous finding of Pury and Mineka [1997. Covariation bias for blood-injury stimuli and aversive outcomes. *Behaviour Research and Therapy*, 35, 35–47] that people are generally liable to selectively associate BII-stimuli with aversive outcomes.

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## 1. Introduction

Covariation bias is one of the cognitive biases that is assumed to play a role in the refractoriness of phobic fears (Mineka & Sutton, 1992). Accordingly, laboratory studies showed that individuals high in fear systematically overestimate the contingency between pictures of their feared object and aversive outcomes (e.g., Pauli, Montoya, & Martz, 1996; Tomarken, Mineka, & Cook, 1989). In accordance with the alleged reciprocal relationship between phobia-relevant associative biases and phobic fear, these biases have been found to be substantially reduced in treated individuals (de Jong, Merckelbach, Arntz, & Nijman, 1992), and (residual) post-treatment covariation bias was found to be a powerful predictor of relapse after successful exposure treatment (de Jong, van den Hout, & Merckelbach, 1995).

In apparent conflict with the idea that covariation bias is generally involved in the maintenance of specific phobias, a series of experiments testing the role of covariation bias in blood-injection-injury (BII) fears revealed that the tendency to selectively associate BII-fear-relevant stimuli (mutilated bodies, surgery, minor injuries) with aversive outcomes was not especially pronounced in BII fearful individuals (Pury & Mineka, 1997). However, thus far studies on fear-relevant covariation bias (including the experiments of Pury and Mineka) focussed on harm/pain-relevant outcome associations. Such an approach seems appropriate when phobic distress is characterized by fear of the physical harm (e.g., snake phobia). Yet, there is increasing evidence that BII phobia is qualitatively different from the other specific phobias in the sense that strong feelings of disgust and repulsion rather than (threat-induced) fear is the dominant emotional response (Page, 1994; Sawchuk, Lohr, Westendorf, Meunier, & Tolin, 2002; Tolin, Lohr, Sawchuk, & Lee, 1997). Since there is evidence that affective similarity between stimuli and outcomes is an important factor in the generation of fear-relevant associative biases (e.g., Davey & Dixon, 1996; Tomarken, Sutton, & Mineka, 1995), it may well be that inflated disgust-related rather than harm-related outcome associations are critically involved in BII fears.

Therefore, the present study was designed to examine whether indeed typically high BII fearful individuals show a bias to overassociate blood-related stimuli with disgust-relevant (aversive) outcomes. We used an illusory correlation paradigm that was very similar to the paradigm used in the earlier studies of Pury and Mineka (1997), with the exception that the present experiment not only included the traditionally used harm-relevant outcome (i.e., shock), but also a disgust-relevant outcome (i.e., drinking a distasting fluid) (cf. Davey, Cavanagh, & Lamb, 2003). To index covariation bias we assessed both postexperimental covariation estimates and on-line outcome expectancies (de Jong, Merckelbach, & Arntz, 1995). Such a procedure allows one to follow the pattern of expectancies over trials and to examine the influence of prior fear on the rate of disconfirmation of participants' expectancies.

In addition, we tested high and low BII fearful individuals' preexperimental expectancies of covariation (e.g., de Jong, 1993; McNally & Heatherton, 1993). It has been shown in a series of studies that high fearful individuals not only tend to retrospectively overestimate the actual contingency between phobia-relevant cues and aversive outcomes, but also show a priori expectancies for phobic stimuli to be followed by aversive outcomes (e.g., Kennedy, Rapee, & Mazurski, 1997). Even if high BII fearful individuals turn out to be very sensitive to corrective information and do not display a disgust-relevant covariation bias, they may still be characterized by a disgust-related expectancy bias. Such a bias may

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