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Disgust, anxiety, and vasovagal syncope sensations: A comparison of injection-fearful and nonfearful blood donors

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ABSTRACT

Although research has implicated disgust in the fainting response observed in blood-injection-injury (BII) phobia, this finding has not been consistently observed in the literature. The present study further examines the relationship between disgust and fainting symptoms among injection-fearful ($n = 108$) and nonfearful ($n = 338$) blood donors. Volunteers from community blood drives provided pre-donation levels of anxiety and disgust towards giving blood and completed a standardized measure of vasovagal reactions (fainting) to blood donation after giving blood. As predicted, injection-fearful participants reported significantly more pre-donation anxiety and disgust compared to nonfearful participants. Injection-fearful donors also reported experiencing more fainting symptoms during blood donation and found the donation experience more unpleasant than did nonfearful participants. Although pre-donation disgust and anxiety levels each uniquely predicted fainting symptoms among nonfearful donors, only pre-donation anxiety uniquely predicted fainting symptoms among injection-fearful donors. Implications of these findings for conceptualizing the disgust–faint relationship in BII phobia are discussed.

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Blood-injection-injury (BII) phobia is characterized by a persistent, excessive, and irrational fear at the sight or anticipation of blood, wounds, syringes, injuries, mutilation, and similar stimuli (DSM-IV, American Psychiatric Association, 2000; Marks, 1988). BII phobia has a lifetime prevalence rate of 3.5% and an early age of onset at around 5.5 years (DSM-IV, American Psychiatric Association, 2000). It is also the second most common specific phobia for which people seek treatment (Kleinknecht & Thorndike, 1990). BII phobia may also be chronic in the absence of treatment (Marks, 1988). In severe cases, phobic individuals may delay or even avoid seeking necessary medical care despite negative health consequences (Kleinknecht & Lenz, 1989; Page, 1998).

BII phobia is unique from other phobic disorders in that approximately 75–80% of those affected have a distinct fainting response (or vasovagal syncope) during exposure to phobic-relevant stimuli (Kleinknecht & Lenz, 1989; Meade, France, & Peterson, 1996; Olatunji, Connolly, & David, 2008; Page, 1994) which may be partially genetic (Page & Martin, 1998). Several studies have attempted to delineate the physiological profile of this unique fainting response in BII phobia. Such research suggests that fainting in BII phobia is marked by a diphasic response that involves two successive responses with opposing directions of activity (Graham, Kabler, & Lunsford, 1961). The initial phase of this diphasic response is characterized by an increase in sympathetic nervous system activity (i.e., increased heart rate), which has been attributed to the experience of fear and anxiety (e.g., Curtis & Thyer, 1983). The fainting response is observed during the second phase where a surge in parasympathetic nervous system activity occurs, leading to a rapid decrease in blood pressure (Page, 2003).

Additionally, several studies attempting to delineate the emotional correlates of BII phobia are beginning to shed light on the basic mechanisms behind this unique fainting response. Kleinknecht, Kleinknecht, and Thorndike (1997) found that highly fearful individuals report the greatest likelihood of fainting during exposure to BII-related stimuli. Although BII stimuli produce a reliable fear response for phobic individuals (Kleinknecht, 1987, 1988), they have also been shown to elicit disgust reactions (Olatunji, Lohr, Sawchuk, & Westendorf, 2005; Page, 2003). For example, related research has found that while BII phobics respond with both fear and disgust when exposed to images of threat-relevant stimuli, disgust is the dominant emotional response (Sawchuk, Lohr, Westendorf, Menuier, & Tolin, 2002; Tolin, Lohr, Sawchuk, & Lee, 1997). Furthermore, individuals with BII phobia, compared to controls, often present with a markedly heightened 'disgust sensitivity', the propensity towards experiencing disgust (Olatunji, Arrindell, & Lohr, 2005; Olatunji, Lohr, Smits, Sawchuk, & Patten, 2009). Given that the experience of disgust is often characterized by parasympathetic activity (Levenson, 1992), one hypothesis is that the activation of the parasympathetic system that is

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responsible for the unique fainting response in BII phobia may be attributed to disgust (Page, 1994).

Although there are intuitive reasons for implicating disgust in the fainting response in BII phobia, empirical evidence supporting this observation has been mixed. For example, Hepburn and Page (1999) found that exposure to disgust-evoking images increased symptoms of faintness to BII-related stimuli. Page (2003) has also shown that highly disgust sensitive individuals reported more symptoms of faintness during exposure to blood and injection stimuli compared to participants low in disgust sensitivity. However, other research has failed to find evidence for increased parasympathetic activation among those with BII phobia or even an association between disgust levels and parasympathetic activation, suggesting that disgust sensitivity may not directly explain the fainting response (Gerlach et al., 2006). Furthermore, descriptive research has shown that disgust sensitivity does not contribute unique variance to the prediction of BII-related fainting symptoms above the variance accounted for by fear and anxiety levels (Olatunji, Williams, Sawchuk, & Lohr, 2006). These findings suggest that the disgust-BII-faint relationships may be illusory and perhaps are mediated by the covariation of disgust with fear and anxiety (Kleinknecht et al., 1997).

These conflicting findings about the causal role of disgust in BII-related fainting highlight the need for additional research. To date, this research question has largely been addressed with questionnaire measures completed by undergraduate students (Kleinknecht et al., 1997; Olatunji et al., 2006) or in the experimental laboratory (Exeter-Kent & Page, 2006; Page, 2003). Surprisingly, no study to date has examined the relationship between disgust and fainting among blood donors, where fainting is often problematic (France, France, Roussos, & Ditto, 2004; France, Rader, & Carlson, 2005). Indeed, fainting has been posited as the greatest deterrent of repeat donations for new blood donors (Gorlin & Petersen, 2004; Newman, Ahmad, & Newman, 2004; Ownby, Kong, Watanbe, Tu, & Nass, 1999). Therefore, the present study further examines the relationship between disgust and fainting symptoms among injection-fearful and nonfearful blood donors. Consistent with prior research (Olatunji et al., 2006), it was predicted that disgust levels would be associated with fainting responses during blood donation among injection-fearful and nonfearful donors. However, the relationship between disgust levels and fainting responses during blood donation was predicted to be accounted for by anxiety levels among injection-fearful, but not nonfearful, donors. These findings were hypothesized to be specific to fainting responses, not simply a generalized unpleasant reaction to blood donation.

1. Methods

1.1. Participants

Participants were recruited from community blood drives between February and July 2008. A total of 446 individuals volunteered to participate in the present study. There were 285 females (63.9%) and 161 males (36.1%) with a joint mean age of 35.67 (range = 18–80; SD = 14.05). Participants endorsing "yes" to the question: "Do you get nervous or afraid when receiving blood draws or injections?" were classified as injection-fearful and those who responded "no" were classified as nonfearful.

Table 1
Descriptive statistics for injection-fearful and nonfearful participants.

Variable	Injection-fearful (n = 108)	Injection-nonfearful (n = 338)
Demographics		
Age*	30.41 (12.25)	37.35 (14.19)
Weight (lbs)	166.39 (35.64)	173.94 (39.74)
Ethnicity (% Caucasian)	80.6%	86.9%
Gender (% Female)	71.3%	61.5%
Pre-screen questions		
Fasting (% Yes)	2.7%	1.5%
Number of times donated*	2.99 (1.28)	3.42 (1.07)

Note. *p < .01.

1.2. Materials

The Pre Donation Questionnaire (*PDQ*) was developed to obtain demographic information including age, gender, weight, and ethnicity. The PDQ also assessed the degree of negative affect (disgust, anxiety, fear, pain) expected during the blood donation experience on a 5-point Likert scale of "*None at all*" to "*Extreme.*"

The Blood Donation Reactions Inventory (*BDRI*; Meade et al., 1996; Sauer & France, 1999) assesses subjective physiological reactions to blood donation. The scale requested ratings of 11 physiological reactions associated with vasovagal syncope, including faintness, dizziness, weakness, facial flush, visual disturbance, difficulty hearing, lightheadedness, rapid or pounding heart, sweating, rapid or difficult breathing, and nausea or upset stomach. Responses to each item were rated on a 6-point Likert scale of "0" (Not at all) to "5" (To an extreme degree). The BDRI had an alpha coefficient of .93 in the present study.

Participants also rated how unpleasant the blood donation experience was on a scale of "0" (not at all unpleasant) to "100" (maximally unpleasant).

1.3. Procedure

Volunteer blood donors were asked to complete the PDQ before donating blood. After successfully giving blood, donors then completed the BDRI and also indicated how unpleasant the blood donation experience was.

2. Results

2.1. Participant characteristics

The injection-fearful group consisted of 108 individuals [77 females (71.3%) and 31 males (28.7%) with a joint mean age of 30.41 (SD = 12.25)]. The nonfearful group consisted of 338 individuals [208 females (61.5%) and 130 males (38.5%) with a joint mean age of 37.35 (SD = 14.19)]. As shown in Table 1, injection-fearful

Table 2
Group means (standard deviations) of study measures among injection-fearful and nonfearful participants and the total sample.

Question/measure	All participants	Nonfearful	Injection-fearful	t	d
Anxiety	.74 (.85)	.47 (.64)	1.58 (.89)	14.39*	1.43
Disgust	.20 (.54)	.10 (.38)	.50 (.80)	7.01*	.64
Unpleasantness	10.12 (20.48)	7.18 (18.00)	18.69 (24.59)	4.77*	.53
BDRI	2.92 (6.55)	2.17 (5.91)	5.08 (7.76)	3.73*	.42

Note. BDRI: Blood Donation Reactions Inventory. Cohen's d was calculated as the difference between the mean scores in each group divided by the pooled standard deviation.
*p < .001.