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Induced disgust increases negative implicit attitudes towards blood donation

Philippe T. Gilchrist^{1,2*}, Simone Schnall³, Tudor Vranceanu⁴, Sebastien Nguyen⁵, & Blaine

Ditto⁵

¹Department of Psychology, Macquarie University, Sydney, Australia.

²Centre for Emotional Health, Macquarie University, Sydney, Australia.

³University of Cambridge, Department of Psychology, Cambridge, UK

⁴Université de Montréal, Department of Medicine, Montréal, Canada

⁵McGill University, Department of Psychology, Montréal, Canada

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Correspondence concerning this article should be addressed to Philippe T. Gilchrist, Macquarie University, North, Ryde, New South Wales 2109, Australia; e-mail:

philippe.gilchrist@mq.edu.au

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Abstract

Background and objectives: The blood donation environment includes a variety of disgust-related stimuli that may influence attitudes among new and prospective donors. To explore the causal role of disgust in the context of attitudes toward blood donation, we experimentally induced feelings of disgust (vs. fear, moral elevation, or control). We hypothesized that for people who are generally sensitive to their bodily sensations, disgust would lead to more negative implicit attitudes towards blood donation than other emotions.

Materials and methods: 123 participants completed a questionnaire package including private body consciousness, disgust, altruism, and social desirability. Next, participants watched one of four videos with emotional content: a video segment depicting a filthy toilet (disgust), a man chasing a woman and child wielding an axe (fear), a man whose life was positively changed by a mentor (moral elevation), or a nature documentary (control). After the video, participants completed a Single-Target Implicit Association Test (ST-IAT) and questions regarding explicit attitudes towards blood donation.

Results: As predicted, the disgust video resulted in lower implicit attitudes towards blood donation for participants high in private body consciousness. Disgust sensitivity predicted lower donation interest, but not implicit attitudes or explicit intention. There was no effect of emotion on explicit attitudes.

Conclusion: Automatic processes should be considered in the development of interventions aimed at promoting prosocial and health behaviours. Management of disgust-related stimuli in donation centres and recruitment campaigns might improve attitudes towards blood donation.

Key words: donation intention; disgust; fear; implicit attitudes.

Without an adequate supply of blood, the medical system would suffer and various procedures such as surgeries and transfusions would become impossible. Ongoing efforts are required to ensure the safety and stability of our supply [1, 2]. There are a wide variety of donor recruitment and retention strategies available [3,4,5], many of which have focused on practical issues such as increasing the convenience of donating, sending reminders to donors, and information provision including notification of supply shortages [6,7]. The prediction of blood donation has also been informed by cognitive approaches primarily informed by the theory of planned behaviour and various extensions of the theory [8,9,10,11,12]. Although this has helped predict donation intentions, it is also important to note that blood donation is not simply a rational or pragmatic decision. Indeed, these approaches have not been very fruitful in developing new recruitment strategies, so more attention is required to address neglected factors such as donation-related emotions and memory [13,14,15]. Further complicating donation recruitment research, self-reported explicit donation intentions may account for only up to 56% of the variance of actual donation behaviour [16]. Similarly, measuring donation intentions is complicated by demand characteristics due to its prosocial nature. Therefore, the reliance on explicit self-report of donation motivators has led to the focus on emotional motivators and the development of novel measures of donation attitudes that do not rely on explicit measures [17].

Both negative and positive emotions have been documented throughout the donation process, and a better understanding of these may inform the development of novel recruitment and retention strategies [15,18]. Some people may donate due to the anticipated emotional benefits such as the positive feeling of a 'warm glow' [19,20]. Other than these types of emotional and perhaps small social rewards, there is indeed very little to be gained by donating blood. Emotional deterrents such as fear are common and are associated with reduced donation

intentions, donation behaviour, and donor adverse reactions [21,10]. In addition, exposure to paraphernalia (e.g., blood bags, needles, etc.) associated with the blood donation context is associated with increased anxiety and decreased positive attitudes towards donation [22]. However, apart from fear and anxiety, very little is known about the impact of other negative emotions on donation attitudes. Furthermore, the role of emotion or such paraphernalia in blood donation attitudes outside of donation centres, particularly among nondonors, remains largely unexplored [15].

Recent studies in the organ donation literature suggest limitations to the dominant rational-cognitive approach to predicting donation intentions. Like blood donation, organ donation involves virtually no tangible reward and has also been construed as an act that is sometimes motivated by ‘altruistic’ emotions [23,24]. Compared to cognitive variables (e.g., attitude, knowledge, subjective norm, etc.), visceral and affective attitudes are better predictors of whether someone decides to donate their organs or not [25]. In particular, disgust about the idea of organ donation is a significant barrier to organ donation registration [26]. Given that the blood donation context also involves stimuli that are likely to elicit disgust, namely blood and a so-called ‘body envelope violation’ [27], it is likely that those anticipating giving blood, or those actually doing so, may be discouraged from subsequent donations.

Blood donation has also long been construed as a prototype of prosocial or altruistic behaviour and an inherently moral act [28]. However, the relation between self-reported altruism and blood donation motivation is less clear and does not predict actual donation [29, [29,30]. Insight into emotional processes, may provide the necessary insights to better predicting blood donation motivations and behaviour. For example, the link between moral emotions such as disgust and blood donation remain unexplored.

A large body of research has also linked disgust with morality more generally [31,32,33]. For example, induced disgust by use of a film induction resulted in more severe moral judgements than a control or sadness film, and this effect was only present for those who were more sensitive to the emotion because they were generally high in trait private body consciousness -i.e., the sensitivity to sensations of one's body [34]. It has been argued that disgust can be construed as part of a loss aversion system, protecting resources including one's body, and most relevant when the components of the body are potentially violated or sacrificed [33]. Relatedly, disgust sensitivity appears to play a role in blood and injection fears [35] and is tied to both the blood donation context and moral attitudes.

In contrast to disgust, the emotion of moral elevation has been described as 'opposite' to disgust and can be elicited by witnessing virtuous acts including charitable giving, gratitude, and generosity [36]. While disgust may negatively influence donation attitudes, elevation tends to generally encourage prosocial behaviour, of which donation may be construed as an example. Moral elevation, elicited by a brief laboratory video stimulus, increased helping more than other positive emotions such as amusement or happiness [37]. Thus, displays of prosocial acts can lead to feelings of elevation and influence acts of generosity and acting upon one's values [38,39]. Though moral elevation is associated with a variety of prosocial acts, its association to attitudes or the context of blood donation is less clear.

To explore the causal role of disgust in the context of attitudes toward blood donation, we experimentally induced disgust (vs. control, fear, and moral elevation). Because people are not always willing or able to accurately report attitudes, and to examine the inherent automatic processing involved in this form of decision-making, we used an implicit measure recently validated for blood donation attitudes (Single-Target Implicit Association Test; ST-IAT) [17].

We hypothesized that, relative to other emotional states including an anxious control, disgust would lead to more negative attitudes towards blood donation among people high on private body consciousness (i.e., sensitivity to bodily sensations), since a moderating role of this individual difference variable was found in previous research using disgust inductions [34]. We also explored the role of disgust sensitivity as a trait, and self-reported altruism in donation attitudes.

Method

Participants

124 participants were recruited to take part in a study about ‘cognitive processing and attitudes toward medical services.’ One participant was excluded due to an interruption of the testing procedure. The final sample included 123 participants (70% female), aged 18 to 30 ($M=22.1$; $SD=3.3$). 61% of the sample had no previous blood donation experience.

Procedure

Following written consent, participants completed questionnaires to assess private body consciousness, disgust sensitivity, altruism, and social desirability (to control for the possible confound of demand characteristics). Next, participants watched one of four videos with emotional or neutral content and then completed a measure of implicit attitudes towards blood donation (i.e., Single Target Implicit Association Test). Next, an explicit measure of blood donation intentions that was embedded in a questionnaire about other health activities, followed by a question about donation interest and a manipulation check for disgust. As part of another study cardiovascular responses to the videos, including impedance cardiography and ECG signals, were measured using spot electrodes, and blood pressure was monitored during each

video induction. These variables were not relevant to the current research questions and therefore are not considered here. Participants were paid \$20 for their time.

Materials

Private Body Consciousness Scale (PBC) [40]. PBC is a subscale of the Body Consciousness Questionnaire and assesses awareness of internal sensations of the body. It comprises the following items, all rated from 1 (“disagree strongly”) to 6 (“agree strongly”): “I am sensitive to internal bodily tensions”; “I know immediately when my mouth or throat gets dry”; “I can often feel my heart beating”; “I am quick to sense the hunger contractions of my stomach”; “I’m very aware of changes in my body temperature.” Cronbach’s alpha for this measure was 0.58.

Disgust Scale -Revised (DS-R) [27,41]. The DS-R measures disgust sensitivity across three domains: core disgust, animal-reminder disgust, and contamination disgust. Participants rated how much disgust they would experience if they were exposed to a certain situation on a Likert scale from 0 (“no disgusting at all” or “strongly disagree”) to 4 (“extremely disgusting” or “strongly agree”). Sample items include considering touching a dead body, or seeing a man with his intestines exposed after an accident [27]. Cronbach’s alpha for this measure was 0.83.

Social Desirability Scale (SDS) [42]. The SDS is the most commonly used tool to assess the inclination to respond in a way to make oneself appear good [43], and includes 33 true-or-false questions regarding culturally sanctioned but improbable behaviours. Examples of items include: “no matter who I’m talking to, I’m always a good listener, and “I have almost never felt the urge to tell someone off”. Higher scores suggest greater social desirability. Cronbach’s alpha for this measure was 0.72.

Self-Reported Altruism Scale (SRA) [44]. The SRA assesses explicit self-reported altruism and includes 20 Likert items rated from 0 (“never”) to 4 (“very often”). Sample items include “I have given directions to a stranger”, and “I have given money to charity”. Higher scores indicate higher levels of trait altruism. Cronbach’s alpha for this measure was 0.81.

Stimulus videos. The four videos included scenes depicting (1) an extremely filthy toilet (disgust) [34], (2) a man chasing a woman and child wielding an axe (fear) [45], (3) a young man whose life was positively changed by a mentor (elevation) [39], or (4) a nature documentary (control) [39]. A manipulation check item asked participants to indicate self-reported disgust at the end of the procedure (among alternative emotion filler items) from 1, “didn’t feel at all”, to 9, “felt very strongly”.

Single Target Implicit Association Test for Blood Donation Attitudes (ST-IAT) [17]. This was an image version of a recently developed and validated ST-IAT for assessing automatic attitudes toward blood donation. Images included blood donation pictures, four pleasant pictures, and four unpleasant pictures. By assessing reactions times to categorize related images, this task measures the degree of association between the concept of blood donation and positive or negative valence. Faster responses to stimuli paired with unpleasant stimuli (rather than pleasant stimuli) reflect a more unpleasant association (e.g., more negative implicit attitude). The ST-IAT has demonstrated construct validity with self-reported donor and non-donor status, and significant relations were in expected directions with explicit measures of donation attitudes and fear [17]. Discriminant reliability was also supported by a lack of association with social desirability scores, and criterion-related validity was demonstrated by better prediction of intentions in the presence of fear [17]. Details of implicit attitudes scoring algorithms are

reported elsewhere [17,46]; The ST-IAT was described to participants during the procedure as a ‘computerized sorting task’.

Explicit Blood Donation Intentions. Participants received a health activities questionnaire within which items about blood donation intentions were embedded. It was an abbreviated version of a questionnaire previously used to assess various psychosocial factors including intentions to seek out three medical activities: dental exams, flu vaccination, and blood donation [10, 47,48]. Dental exams and flu vaccination items were included as distractor items to obscure the focus of the study on blood donation and, consequently, minimise potential demand characteristics.

In addition to a question about donation eligibility and donation history, two donation intention items were included: “I intend to give blood during the next six months”, and “I will try to give blood during the next six months,” rated from 0, “very unlikely, to 5, “very likely”. These two donation intention items were summed into a single ‘donation intention’ score. Cronbach’s alpha for this measure was 0.96. Lastly, as another means of assessing explicit attitudes towards donation, participants also indicated how interested they were to donate blood in the next year from 1, “not interested at all”, to 9, “very interested”.

Results

We first tested whether the videos successfully induced disgust by examining the manipulation check item. As expected, there was a main effect of Condition on self-reported disgust ($F(3,119) = 74.80, p < .0001, \eta^2_p = .65$). A post-hoc Fisher’s least significant difference (LSD) test indicated that, although the fear inducing film resulted in more disgust relative to the control and elevation films (p ’s $< .001$), self-reported disgust was significantly higher following the disgust inducing film ($M=6.58 SD=2.43$) compared to all other films including elevation

($M=1.16$, $SD=0.73$), control ($M=1.00$, $SD=0.00$), and fear ($M=4.80$, $SD=2.50$) films (all p 's $<.001$).

We then analysed the main outcome variable, namely participants' implicit attitudes toward blood donation as reflected in their reaction times on the ST-IAT. Consistent with previous research, there was a lack of association with social desirability ($p >.05$). An Emotion Condition (Disgust, Fear, Elevation, Control) x Private Body Consciousness (entered as a continuous variable) GLM indicated a significant interaction, $F(3,113) = 4.33$, $p = .018$, $\eta^2_p = .085$. As expected, in the Disgust Condition, individuals high in private body consciousness showed more negative implicit attitudes towards blood donation than those who were low ($p = .003$), whereas this pattern was not observed for any of the other conditions (all p 's $> .05$) (Figure 1). It is especially noteworthy that while the Fear Condition had also produced a high level of self-reported disgust, as noted above, it did not produce a comparable effect on implicit attitudes, thus confirming the unique role of disgust relative to fear.

We also tested if explicit attitudes would show a similar effect. In contrast to implicit attitudes, the Emotion Condition (Disgust, Fear, Elevation, Control) x Private Body Consciousness GLM revealed no effect on self-reported explicit donation intention or interest ($F(3,80) = 2.17$, $p = .10$, $\eta^2_p = .075$; $F(3,114) = 3.49$, $p = .074$, $\eta^2_p = .011$), even after controlling for social desirability as a covariate. Also, the results on both implicit and explicit attitudes remain the same after controlling for donation history.

[Figure 1 about here]

Similar to the effect of the video, self-reported disgust was also associated with more negative implicit attitudes ($B = -.02$, $t(121) = -2.30$, $p = .023$), but not any of the explicit measures

(all p 's > .05). Similarly, the DS-R was associated with less donation interest ($B=-.1.06$, $t(115)=-2.30$, $p=.023$), but not donation intention, or implicit attitudes (p 's > .05). In contrast, controlling for the effect of Emotion Condition and Private Body Consciousness, exploratory analyses of self-reported altruism indicated that altruism was not associated with donation intention, interest, or implicit attitudes (p 's > .05).

Discussion

Consistent with our hypothesis, when compared to elevation, fear, and a control induction, induced disgust led to more negative implicit attitudes towards blood donation among participants sensitive to bodily sensations. Supporting the notion that people are not always willing or able to accurately report blood donation attitudes or intention, this effect was not observed in explicit measures of donation intention or donation interest. However, elevation was not associated with donation attitudes. Though elevation may be construed as the opposite of disgust and is associated with prosocial behaviour [36], its effects on prosocial attitudes remain unsupported. One possibility is that the images used in the IAT (and typically associated with blood donation) are somewhat negative in valence, so it might have been easier for the disgust induction to render these more negative, while it would have been relatively difficult for the elevation induction to turn these from negative to positive valence. Thus, there may be a certain asymmetry in the extent to which attitudes toward blood donation can be modified by a relatively mild emotion induction.

The current findings are consistent with a growing area of research, though at times contentious, that outlines a variety of ways that disgust is intricately associated with morality [31,32,34]. There are many forms of disgust and it is likely associated with a variety of blood donation paraphernalia (e.g., blood bags, needles, and related images), in addition to the idea of

blood loss [49]. Indeed, disgust can be understood as part of a loss aversion system that protects our resources, including the integrity of our body [33]. The idea of blood donation involves both the violation of the body envelope and a sacrifice of its contents. In these ways, although the outcome of donating blood could be perceived as morally elevating, the act of donation itself is intricately tied with disgust.

The effects of induced disgust on explicit and implicit attitudes have implications for future studies examining donation behaviour. Explicit attitudes tend to be more strongly associated with deliberate and planned behaviour, whereas implicit attitudes may better predict more spontaneous decisions [50,51]. Therefore, due to its effects on implicit attitudes, induced state disgust might be less relevant to planned blood donations and more relevant to spontaneous drop-in donations -e.g., 'donor drives'. Disgust sensitivity (an explicit measure), however, was associated with less donation interest but not implicit attitudes. Thus, disgust sensitivity might be more relevant to planned or scheduled donations. Further research is required to examine this additional possibility as the analyses related to disgust sensitivity were exploratory.

Though the effects of altruism might be undercut by scheduling mobile clinics in inconvenient locations as well as other practical deterrents, the connections with disgust are much deeper. As a potential clinical implication of the current findings, spontaneous or drop-in donation may be improved by managing and obscuring donation-related paraphernalia in that environment. This idea is consistent the finding that blood donation's environment (e.g., a variety of visible blood bags, needles, etc.) led to less positive attitudes towards donation [22]. When considered in light of the current findings, the mechanism may have been through the influence of specific paraphernalia on feelings of disgust. Importantly, feelings of disgust may only be relevant for those who are higher in private body consciousness, consistent with the

James-Lange theory and related formulations in the area of embodied cognition more generally, though this discussion is beyond the scope of the current paper.

The implicit measure in this study has benefits over explicit measures, including increased sensitivity to measuring blood donation attitudes where norms and expectancies tend to compromise self-report. Nonetheless, implicit association tests should be interpreted with caution, though may be generally considered a valid means to assess the strength of evaluative associations in prejudice, stereotypes, and account for automatic associations [52,53,54]. Indeed, the current results show a mixed pattern of implicit and explicit indicators of donation attitude, as expected. However, future studies should replicate and extend the current findings and determine whether the effect of disgust on implicit donation attitudes translates into fewer actual drop-in donations. Moreover, although an effect of elevation on attitudes was not evident, future studies may examine whether effects more powerful real-life interventions can override the negative affect inherent in the donation context.

A growing body of research targets automatic processes to improve health behaviour change interventions (Marteau, Hollands, & Fletcher, 2012). Similarly, the current findings suggest that automatic/implicit processes may also influence prosocial behavioural intentions, suggesting wider health-related implications beyond blood donation, possibly including medical activities such as vaccinations, medical screening, or other check-ups.

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Figure 1. Implicit association scores as a function of emotion induction and private body consciousness (PBC). The higher the score, the stronger the association. Means (\pm SEM) are shown for PBC for illustrative purposes only, while analyses retained the continuous variable.

[NB: Separate file uploaded for Figure 1.]

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