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Prosthesis use is associated with reduced physical self-disgust in limb amputees

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ABSTRACT

Self-disgust is an emotion schema negatively affecting people's body image and is triggered by bodily imperfections and deviations from the "normal" body envelope. In this study, we explore the idea that "normalising" the body in those with limb amputations via the prosthesis would be linked to reduced self-directed disgust. An international clinical community sample ($N = 83$) with mostly lower limb amputations completed measures about their demographics, prosthesis, adjustment, body image disturbance, psychological distress, and self-directed disgust in a survey design. Consistent with the "normalising" hypothesis, correlation and bootstrapped regression models revealed, first, that frequency of prosthesis use was significantly and negatively associated with physical self-disgust. Second, prosthesis use significantly mediated the exogenous effect of time since amputation on physical self-disgust. These results emphasise the psychological value of the prosthesis beyond its functional use, and stress its importance in normalising the body envelope in those with limb amputations, which may in turn promote psychological well-being.

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1. Introduction

Disgust is a universal emotion (Ekman, 1992), theorised tohave its evolutionary origins in the distaste response, which prevents an organism from ingesting noxious substances (Rozin & Fallon, 1987). The emotion functions to help people avoid disease by promoting the behavioural avoidance and rejection of unpalatable stimuli (Curtis, Aunger, & Rabie, 2004). Beyond oral disease threats, the human disgust-eliciting repertoire has expanded to include wider pathogenic stimuli, indicators of poor reproductive quality, reminders of death and mortality, and sociomoral transgressions that violate the moral virtues of divinity and purity (Chapman & Anderson, 2012). Disgust, then, serves to protect the border of our body (and mind) from a diverse range of (socioculturally-defined) potential external contaminants (Rozin, Haidt, & McCauley, 1999). It has been suggested that such contaminants include less attractive or atypical bodily features that mimic signs of infectious disease (e.g., acne; Oaten, Stevenson, & Case, 2011), trigger concerns about genetic and reproductive quality (e.g., obesity; Park, Schaller, & Crandall, 2007), and/or involve violations of an idealised and desirable exterior body shape (e.g., disfigurement; Shanmugarajah, Gaind, Clarke, & Butler, 2012).

As an emotion that is felt when the body border is violated, disgust is intimately linked to body image (i.e., the way an individual perceives and evaluates their own body). It has been associated with body stigma, criticism, and dissatisfaction (Griffiths & Page, 2008; Park et al., 2007) and linked to socioculturally-regulated bodily practices (e.g., menstruation; Fahs, 2014; Roberts, Goldenberg, Power, & Pyszczynski, 2002). Elevated disgust has been shown to negatively predict psychological well-being in physical and mental health conditions that involve changes to the body, such as cancer (Azlan, Overton, Simpson, & Powell, 2017; Powell, Azlan, Overton, & Simpson, 2016) and eating disorders (Troop & Baker, 2009). Physical atypicality is also a significant predictor of disgust reactions. For example, people with higher levels of proneness to disgust tend to report greater negative reactions and visual attention to photos of disfigured faces (Shanmugarajah et al., 2012; Stone & Potton, 2018). In the present study, we consider the role of disgust in the context of another salient source of bodily change: that induced by limb amputation.

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Limb amputations are a prototypical case where one would expect disgust to feature. They involve violations of an idealised body envelope (i.e., the exterior body border), they are associated with reminders of mortality and death, and are linked to pathogen or disease concerns. Indeed, limb amputation stimuli have been used to induce disgust states in people experimentally (e.g., Rohrmann, Hopp, Schienle, & Hodapp, 2009). Yet, despite this, no work has considered the role of disgust responses in individuals with limb amputations. In the context of amputation, one particular form of disgust – self-disgust – may be particularly pertinent. While disgust elicitors are often contextualised as external to the agent, the self (and its attributes) can function as its own disgust object (Overton, Markland, Taggart, Bagshaw, & Simpson, 2008; Powell, Simpson, Overton, 2015a; Power & Dalgleish, 2008).

Self-disgust has been theorised as an "emotion schema" involving a persistent disgust-based cognitive-affective orientation toward (bodily and/or characterological features of) the self (Powell, Simpson, et al., 2015a). It has been conceptualised as part of the emotional pantheon centred on bodily characteristics (Fox, 2009; Moncrieff-Boyd, Byrne, & Nunn, 2014; Neziroglu, Hickey, & McKay, 2010), and considerable theoretical interest has been directed towards self-disgust as a pan-diagnostic concept relevant to the development and maintenance of poor psychological health (Powell, Simpson, et al., 2015a). For example, Powell, Simpson, and Overton (2013) identified physical self-disgust to be particularly important in the longitudinal prediction of depression.

Following limb amputation, self-disgust may result from both the innate nature of amputation as a violation of the body envelope and through deviation from the body type that society promotes as "normal" and desirable. In addition to psychosocial difficulties (e.g., adjustment, body image disturbance, and mental health difficulties), self-disgust may promote the use of different maladaptive coping mechanisms. Qualitative research has found that individuals experiencing self-disgust distance themselves from the aspect of self they find disgusting, engaging in behaviours that avoid the disgusting self (Powell, Overton, & Simpson, 2014). For example, people with eating disorders often avoid situations of bodily awareness that trigger self-disgust (Espeset, Gulliksen, Nordbø, Skårderud, & Holte, 2012). Unregulated disgust reactions in the context of healthcare have been shown to lead to behaviours that are deleterious to recovery, such as the avoidance of wound care (Gaind, Clarke, & Butler, 2011). Accordingly, self-disgust in those with amputations may give rise to avoidance of the residual limb, which could cause further physical health problems. Self-disgust may also contribute to the high levels of depression and anxiety that are common following limb amputation (Desmond, 2007; Mckechnie & John, 2014).

Two primary sources of self-disgust have been identified in the literature, those based on "physical" aspects of the self, such as the body and visual appearance, and those based on "behavioural" aspects of the self, including characterological aspects and the way people behave (Overton et al., 2008). While both types of self-disgust have been linked to mental health outcomes, some work has suggested they may have a differential importance in different areas, such as depression (Powell et al., 2013). In those with amputations, as the primary change to the self is physical, and not one's character or standard of behaviour, we may expect any observed effects to be stronger for physical than behavioural self-disgust.

One important factor that is likely to interact with body image and self-disgust in individuals with amputations is the use of prostheses. Beyond their functional benefit, prostheses provide a mechanism of "normalising" the body, both in terms of correcting the original physical body border and retaining a more prototypical physical appearance (Murray & Forshaw, 2013). Accordingly, prosthesis use provides a method of reducing the disgust cues associated with the amputated limb. The use of the prosthesis post-amputation is associated with lower levels of unemployment (Whyte & Carroll, 2002), greater self-esteem (Durmus et al., 2015), greater quality of life, and better adaption to limb loss (Akarsu, Tekin, Safaz, Goktepe, & Yazicioglu, 2013; Zidarov, Swaine, & Gauthier-Gagnon, 2009). Furthermore, Durmus et al. (2015) found that the length of prosthesis use, daily hours of prosthesis use, and satisfaction with the prosthesis were negatively correlated with "general psychiatric symptomatology" (including depression and anxiety). Given the focus on the physical "self," and link with mental health and well-being, these positive effects of prosthesis use may be engendered, at least in part, via an impact of prosthesis use on self-directed disgust. Equally, we may expect lower levels of self-disgust to reduce avoidance of the amputated limb, and thereby increase the likelihood the prosthesis would be used. Research has documented that prosthesis use typically increases over time and is more frequent in individuals with older than newer amputations (e.g., Pezzin, Dillingham, MacKenzie, Ephraim, & Rossbach, 2004), and psychological adaptation to the amputation also improves (Horgan & MacLachlan, 2004). Consequently, we may expect the benefit from "normalising" the body via an increasing use of the prosthesis to become more evident over time, and mediate the effect of time elapsed since amputation on self-disgust.

There is, thus, a strong theoretical case for considering self-disgust and prosthesis use to be linked. As a consequence, it is important to determine empirically how self-disgust relates to prosthesis use, and prosthesis satisfaction, in order that appropriate interventions can be developed to facilitate the betterment of psychological well-being and psychological adaptation in those with amputations. Accordingly, the aim of the present study was to explore the relationship between prosthesis use, prosthesis satisfaction, and body image disturbance, as well as demographic, clinical, and psychosocial factors, in predicting physical and behavioural self-directed disgust following limb loss. We expected that prosthesis use would be negatively associated with self-disgust in the face of other important predictor variables, with stronger effects for physical than behavioural self-disgust. Based on the fact that prosthesis use and psychological adaptation to the amputation improves over time (Horgan & MacLachlan, 2004; Pezzin et al., 2004), we also explored whether prosthesis use had a significant mediating (explanatory) effect on the exogenous (unidirectional) relationship between time since amputation and levels of self-disgust.

2. Method

2.1. Participants

Eighty-three participants (37 women) with (majority lower, $n = 78$) limb amputations took part in this study. The age of the participants ranged from 18 to 78 years ($M = 52.44$, $SD = 14.10$). The majority of participants identified as White/Caucasian ($n = 79$), and were recruited from predominantly English-speaking countries: United States ($n = 57$), United Kingdom ($n = 12$), Australia ($n = 10$), Canada ($n = 2$), Switzerland ($n = 1$), and South Africa ($n = 1$). Time since amputation ranged from 0 to 48 years ($M = 12.66$, $SD = 14.13$). Reasons for amputation included "other" ($n = 34$; e.g., "infection"), "accident" ($n = 28$), "diabetes" ($n = 14$), "vascular disease" ($n = 10$), and "cancer" ($n = 7$); 68% ($n = 56$) of the sample reported experiencing residual limb pain, while 75% ($n = 62$) reported experiencing phantom limb pain. Prosthesis use ranged from 0 to 558 h of an average month ($M = 379.28$, $SD = 161.54$). Of the participants, 66% ($n = 55$) reported below-knee, 27% ($n = 22$) above-knee, 2% ($n = 2$) above-elbow, 1% ($n = 1$) through-knee, 1% ($n = 1$) below-elbow, and 2% ($n = 2$) "other" types of amputation.

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