Body Image 9 (2012) 455–461

Contents lists available at SciVerse ScienceDirect

Body Image

journal homepage: www.elsevier.com/locate/bodyimage

The role of disgust emotions in the observer response to facial disfigurement

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ARTICLE INFO

Article history:
Received 24 April 2011
Received in revised form 26 April 2012
Accepted 5 May 2012

Keywords:
Facial disfigurement
Disgust
Disgust sensitivity
Observer

ABSTRACT

Social intrusions by observers are commonly reported by those with disfiguring conditions. This study examined the role of disgust emotions in the observer response. A group of students ($N = 48$) completed quantitative questionnaires measuring extent of disfigurement, whilst viewing images of faces with varying disfigurements. Another group of students ($N = 84$) completed quantitative questionnaires measuring level of disgust elicited by the same images. Disgust sensitivity was measured using the Disgust Scale Revised. Observers reported greater levels of disgust ($p < .01$) with increasing severity of facial disfigurement. Individuals with a higher disgust sensitivity reported increased levels of disgust in response to faces of mild ($p = .03$), moderate ($p = .02$) and severe ($p < .01$) disfigurement compared to those with a lower disgust sensitivity. This provides an explanatory framework for the avoidance reactions of observers and may be important in understanding variability in adjustment following disfigurement.

Introduction

Psychological processes involved in adjustment to disfigurement are becoming better understood with evidence of wide variation in individual experience (Cordeiro, Clarke, White, Sivakumar, Ong, & Butler, 2010; Rumsey, Clarke, & White, 2003; Rumsey, Clarke, White, Wyn-Williams, & Garlick, 2004). Many people develop a robust coping response, managing the challenges of unusual appearance in a positive and proactive way with little evidence of body image anxiety or impact on other parameters of adjustment, such as low mood, low self esteem, social anxiety or avoidance. However, others may have great difficulty adjusting to disfigurement. Indeed, Rumsey et al. (2012) have recently reported that a substantial group (60%) of a disfigured community and clinic-based population experience a significant impact on everyday life, including negative thoughts about the self, avoidance and reluctance to participate in social events. Previous studies have demonstrated that the psychological impact of disfiguring injuries is unrelated to biomedical factors, such as the cause or objective severity of the condition (Moss, 2005; Ong, Clarke, White, Johnson, Withey, & Butler, 2007; Rumsey et al., 2003, 2004). Rather, psychosocial factors such as subjectively perceived visibility and severity, the level of worry or pre-occupation with appearance and the quality of social skills are the important predictors of psychological distress, including appearance-related anxiety, self-consciousness of bodily and sexual appearance, avoidance and low self-esteem (Ong et al., 2007; Rumsey & Harcourt, 2004a, 2004b).

However well adjusted, people with facial differences commonly report intrusive behaviour from others, particularly during first encounters. Macgregor (1990) has described this as stares, startle reactions, whispering remarks, curiosity, personal questions, advice, pity, aversion, ridicule and avoidance from strangers. A recent study by Gardiner, Topps, Richardson, Sacker, Clarke, and Butler (2008) has explored the factors that contribute towards this negative observer response. This demonstrated that the potential impact of facial lesions as rated by observers is influenced by the sex and age of the face, with facial skin lesions considered more disfiguring for children and younger women. In a separate study conducted by Changing Faces, a UK based charity that provides support for people living with facial disfigurements, the judgements made by observers in response to facial disfigurements were examined. They conducted a public attitudes survey, using a conventional survey and an Implicit Attitude Test (Changing Faces, 2008). The vast majority of observers who completed the conventional survey reported that their attitudes to people with facial disfigurements were no different from their attitudes to other people. However, the Implicit Attitude Test revealed that almost all of the observers had an underlying negative attitude towards people with a facial disfigurement, judging them as being less attractive, less likely to succeed, less socially skilled and less likely to lead happy lives.

Whilst the stigmatisation of those with disfigurements is well documented, there has been little work on the cognitive processing of observers in response to disfigurement. Partridge (1990) hypothesised an information processing theory to explain the unsolicited attention from observers. Here, the presence of the disfigurement is assimilated into existing cognitive schemas. The time taken

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http://dx.doi.org/10.1016/j.bodyim.2012.05.003

to process the new information (the disfigurement) results in a longer gaze. This longer latency of response to a disfigurement is interpreted as a negative cognitive bias towards people who look unusual. It has also been suggested that negative responses to disfigurement may have emerged from a cognitive threat detection mechanism (Kurzban & Leary, 2001; Park, Faulkner, & Schaller, 2003). As many contagious diseases produce physical lesions, the presence of a disfigurement is recognised by observers as a possible threat, triggering the well-documented avoidant behaviours.

An alternative approach to understanding the negative responses of observers to those with disfigurements is the study of emotional responsiveness, and in particular the emotion of disgust. Rozin and Fallon (1987, p. 23) define disgust as "revulsion at the prospect of (oral) incorporation of an offensive object." When the emotion of disgust is evoked, there is a characteristic facial expression involving movements of the mouth and nose that discourage oral ingestion and an accompanied physiological feeling of nausea (Rozin, Haidt, & McCauley, 2000). Disgust appears to have evolved as a repulsion mechanism to food but is also elicited by a wide variety of stimuli including food, animals, inappropriate sexual acts, poor hygiene, death, body products and mutilation of the body (Haidt, McCauley, & Rozin, 1994; Rozin et al., 2000).

An increased sensitivity to disgust can be thought of as experiencing higher levels of the emotion when encountering disgusting stimuli. There is considerable variation in responses between individuals, which can be measured using the self-reported Disgust Scale Revised (DS-R) (Haidt et al., 1994; Olatunji, Lohr, Sawchuk, & Tolin, 2007). In general, women have reported higher levels of disgust sensitivity than men in studies using the DS-R (Haidt et al., 1994; Olatunji, Williams, et al., 2007). Increased disgust sensitivity has been implicated in various psychiatric conditions including spider phobias, blood-injection-injury phobias and contamination-related obsessive compulsive disorder (Olatunji, Lohr, et al., 2007; Tolin, Lohr, Sawchuk, & Lee, 1997). The DS-R questionnaire has been used to evaluate disgust sensitivity across three subscales: Core disgust (disgust at the prospect of oral incorporation of stimuli), animal-reminder disgust (aversion towards stimuli that remind humans of their animal nature) and contamination disgust (Olatunji, Williams, et al., 2007). Previous studies have demonstrated that different disgust subscales are involved in specific psychopathological complaints. For example, increased sensitivity to core disgust has been associated with spider phobias (de Jong & Merckelbach, 1998). Similarly, heightened animal reminder disgust levels have been implicated with fear of blood-injury stimuli (de Jong & Merckelbach, 1998).

Disgust has not been well investigated in the context of disfiguring conditions. Variation in disgust sensitivity could help explain the avoidance response in the observer and the variable frequency of a negative response (less likely in people with lower sensitivity). In addition, it may provide insight into the immediate facial expression of the observer (Kleyn et al., 2009), which is less well explained by cognitive theories. Further research investigating the relationship between the emotion of disgust and disfigurements could, therefore, develop understanding of the negative observer response.

A recent study by Kleyn et al. (2009) has investigated disgust emotions in psoriasis, a disfiguring skin condition. They hypothesised that the expression of disgust on the face of an observer is so ubiquitous, that people with psoriasis would suppress or extinguish their response as a means of self-protection, resulting in a diminished capacity to recognise disgust as opposed to other emotional expressions. Using fMRI they compared the response of 13 patients with psoriasis with an age matched control group when viewing images of faces and demonstrated a reduced capacity of the psoriasis group to recognise specifically disgust but not fear expressions.

In this study, we use a self-report methodology to test whether people experience disgust when looking at those with disfigurements. Secondly we examine the relationship between disgust sensitivity and observer ratings of disgust whilst viewing images of disfiguring conditions. We also explore relationships between each of the three subscales of disgust (core disgust, animal reminder disgust and contamination disgust) measured by the DS-R and extent of disgust elicited by images of facial disfigurements. Finally, we evaluate differences between men and women in the disgust response to facial disfigurements.

Following Kleyn et al.'s (2009) findings, we hypothesise that disgust is elicited in observers in response to viewing facial disfigurements, with individuals of higher disgust sensitivities experiencing greater levels of the emotion. In addition, we hypothesise that stronger disgust responses are evoked in women whilst viewing disfigured faces. Finally, we hypothesise that facial disfigurements trigger contamination disgust, core disgust and animal reminder disgust in observers.

Method

Participants

All participants in this study were medical students. In total, 132 students were voluntarily recruited. This included both pre-clinical and clinical medical students. Sixty-nine women and 59 men took part, with sex information unavailable for four participants. Year of study varied from first year to final year at medical school. The age range varied between 18.50 years and 28.17 years ($M = 21.49$, $SD = 1.65$).

Materials

Images. Images of 58 faces (31 females and 27 males) with varying causes and severity of disfigurements were collated from the clinical image banks of clinicians and researchers. This included 45 Caucasian, three African, four South East Asian and six East Asian faces. The images involved faces of all ages, from infants to elderly adults. Four faces with congenital abnormalities (hemangiomas and neurofibromatosis), 10 with burns (hot water scalds, flame burns and chemical burns), four with infectious diseases (measles, cellulitis) 15 with scleroderma, one with psoriasis, two with acne, one with eczema, one with vitiligo, two with Graves' disease, five with malignancies (basal cell carcinomas and squamous cell carcinomas), five with post-operative defects (following free flap reconstructive surgery) and two with traumatic injuries were used. Six normal faces were also included. The areas of disfigurement involved the forehead, eyes, cheeks, peri-orbital area, nose, lips, peri-oral area and chin. The size of facial defects ranged from lesions just a few millimetres in size to disfigurements of the entire face. There were no exclusion criteria with regards to previous surgery or medical treatment. Permission was granted for the use of all images for research purposes. Images were evaluated by the authors and selected for inclusion in the study if they were in colour, at least 1024×768 pixels in resolution and showed just the full frontal view of the face.

Disfigurement questionnaire. In order to attain quantitative measurement of the extent of disfigurement of each image, a questionnaire was designed to collect observer ratings. A 10 cm visual analog scale for each image, with the extremes anchored by the statements "*no disfigurement*" (left) and "*extreme disfigurement*" (right), was used to facilitate fine discrimination and quick completion. Above each visual analog scale was the number of the image and the statement "How would you assess the appearance of this