Behaviour Research and Therapy 47 (2009) 876–881

Contents lists available at ScienceDirect

Behaviour Research and Therapy

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

A disgust mood state causes a negative interpretation bias, but not in the specific domain of body-related concerns

Birgit Mayer*, Peter Muris, Karlien Busser, Jessy Bergamin

Institute of Psychology, Erasmus University Rotterdam, The Netherlands

ARTICLE INFO

Article history:
Received 13 September 2007
Received in revised form
1 July 2009
Accepted 1 July 2009

Keywords:
Anxiety
Disgust
Interpretation bias
Eating disorders

ABSTRACT

The present study was designed to examine the effects of a disgust mood state on negative interpretation bias, in particular in the domain of body and weight concerns. Participants ($N = 120$) were randomly assigned to one of four mood induction groups (i.e., disgust, anxiety, happy, and neutral) and were afterwards asked to respond to various types of ambiguous scenarios to index general threat interpretations, negative body-related interpretations, and neutral/positive interpretations. Results demonstrated that both the anxiety and disgust mood induction groups displayed higher levels of negative interpretations of the ambiguous threat scenarios than the neutral and happy groups. However, no evidence was obtained for a negative interpretation bias in the body-related domain for these negative mood groups, and this conclusion was also true for participants scoring high on a scale of eating disorder symptoms. Altogether, these findings suggest that disgust does not play a role in eating pathology by inducing a negative interpretation bias in the specific domain of body and weight concerns.

Introduction

In addition to its demonstrated role in anxiety disorders such as animal phobia (e.g., De Jong & Muris, 2002), blood-injection-injury phobia (e.g., Sawchuk, Lohr, Westendorf, Meunier, & Tolin, 2002) and obsessive-compulsive disorder (e.g., Olatunji, Sawchuk, Lohr, & De Jong, 2004), disgust sensitivity has been proposed to play a role in eating disorders (e.g., Phillips, Senior, Fahy, & David, 1998). Indeed, Davey, Buckland, Tantow, and Dallos (1998) found substantial correlations between disgust sensitivity and eating disorder symptoms in a non-clinical population. Moreover, Troop, Treasure, and Serpell (2002) documented that eating disordered women were significantly more sensitive to disgust-relevant stimuli than female controls (see also Davey et al., 1998). Furthermore, Troop and colleagues found that women in remission of an eating disorder still reported higher levels of disgust in certain disgust domains as compared to normal control women. However, there are also studies that did not obtain clearly positive relations between disgust sensitivity and eating disorder symptoms (Mayer, Muris, Bos, & Suijkerbuijk, 2008; Muris et al., 2000) or significant differences in disgust (sensitivity) between eating disorder patients and control participants (Schienle et al., 2004). Furthermore, it must be noted that the studies which did report significant connections between disgust sensitivity and eating disorders (symptoms) are inconclusive about the specific disgust domains that are really important to this type of psychopathology, although most evidence has been found for the domains of food and body products (e.g., Davey et al., 1998; Troop et al., 2002).

Apart from the relatively few and rather inconsistent findings, there is no clear theory about the alleged role of disgust (sensitivity) in eating pathology. Most authors (e.g., Griffiths & Troop, 2006) suggest that this relationship is quite plausible because disgust is strongly related to food choice and food rejection, which both seem to play a central role in eating disorders. However, it can also be hypothesized that the link is primarily due to the fact that eating disorder patients often indicate that they are disgusted by their own bodies (see also Davey et al., 1998). In a recent experimental study (Mayer, Bos, Muris, Huijding, & Vlielander, 2008), we hypothesized that disgust sensitive persons more easily experience disgust states, and as a consequence of this negative mood state become more easily dissatisfied with their bodies and therefore tend to engage in body change strategies (e.g., restraint eating). However, the results showed that after successfully inducing a disgust mood state by means of an odor manipulation, female undergraduates were not more dissatisfied with their bodies and neither showed a stronger tendency to employ body change strategies than participants who were tested under non-disgust conditions. In other words, the data did not support the idea that

* Corresponding author at: Institute of Psychology, Faculty of Social Sciences, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands. Fax: +31 10 408 9009.
E-mail address: mayer@fsw.eur.nl (B. Mayer).

0005-7967/$ – see front matter © 2009 Elsevier Ltd. All rights reserved.
doi:10.1016/j.brat.2009.07.001

a more negative evaluation of the body results from a disgust mood state, and as such provided no evidence for a (causal) role of disgust in eating pathology.

In a recent study, Davey, Bickerstaffe, and MacDonald (2006) investigated the effect of induced disgust on interpretation bias using a homophone paradigm. Participants were randomly assigned to either a disgust, anxiety, happy or neutral mood induction and then completed a spelling task which required them to interpret ambiguous words. Results demonstrated that participants who were subjected to the disgust mood induction more often interpreted ambiguous threat homophones (e.g., die/dye) as threatening than participants who had been subjected to the neutral or happy mood induction. In addition, when interpreting ambiguous positive homophones (e.g., sweet/suite), participants in the disgust mood induction group provided less positive interpretations as compared to participants in the happy mood induction group. Interestingly, it was found that the negative interpretation bias as observed in the disgust group was similar to the bias as displayed by participants who had undergone an anxious mood induction. This finding made Davey and colleagues conclude that high levels of disgust may facilitate an interpretation bias that maintains anxious cognition, and as such play a significant role in anxious psychopathology.

Apart from the role of disgust in the promotion of a negative interpretation bias in the domain of threat (thereby playing a role in anxiety problems), it would be interesting to investigate whether disgust is also involved in a negative interpretation bias in the domain of body-related issues (thereby playing a role in eating pathology). For example, imagine that you are in your favorite fashion shop and your friend tells you not to buy the dress that you are trying on. Will your interpretation of this comment be the same when you are in a negative mood than when you are in a positive mood? In her interpretation bias study, Cooper (1997) found that women with eating disorders more frequently interpreted imaginary scenarios in terms of weight and shape concerns, but this was only true for scenarios that referred to negative events and not for events with a positive outcome. In other words, in these patients a body-related interpretation bias only occurred in case of a negative context, which raises the question whether negative mood states are also capable of inducing a negative body-related interpretation bias. Further, in the case of a body-related interpretation bias, it would be interesting to explore whether the type of negative mood state is important. In other words, is such a bias elicited by a negative mood in general or by a more specific mood state related to disgust?

The present experiment was set up to examine these issues. Various types of moods were manipulated (i.e., disgust, anxiety, happy, and neutral) and participants were then asked to respond to various types of ambiguous scenarios to index general threat interpretations, negative body-related interpretations, and neutral/positive interpretations. In line with the findings of Davey et al. (2006), it was hypothesized that in the context of general threat both participants in an anxious mood state and participants in a disgust mood state will show more negative interpretations than subjects in a neutral or happy mood state. For the body-related context, it was hypothesized that a disgust mood state will induce more negative body-related interpretations than a neutral or positive mood state. In line with the results of the Cooper (1997) study, such a bias was expected to be more pronounced in individuals with higher levels of eating disorder symptoms. In addition, it was investigated whether the negative body-related interpretation bias would be specific for a disgust mood or would be evoked by a negative mood in general. Obviously, the demonstration of a link between disgust and a negative interpretation bias in the domain of body and weight would provide evidence for the presumed role of the disgust emotion in eating-related psychopathology. Finally, relevant concepts such as trait anxiety and disgust sensitivity were also measured in this study, as it can be assumed that the effects of the anxious and disgust mood inductions will be more pronounced in participants scoring high on these traits.

Method

Participants

Hundred-and-twenty female undergraduate psychology students participated in the current experiment. Mean age of the participants was 21.14 years ($SD = 2.60$, range 17–35 years). The majority of the participants was from original Dutch descent (i.e., 63.3%). Other participants were also Dutch citizens but had other ethnic backgrounds, such as Turkish, Moroccan, Hispanic or Chinese.

Assessment

Interpretation bias was measured with *30 brief ambiguous scenarios* presented in a booklet. Scenarios were based on ambiguous vignettes as employed by MacLeod and Cohen (1993) and Cooper (1997). Ten scenarios described situations that could be interpreted as threatening, 10 other scenarios were used to tap negative interpretations related to body shape and weight concerns, while the final 10 scenarios described neutral or slightly positive situations (see Appendix). Participants were asked to read each scenario and then had to answer the open question "What do you think?". These answers were afterwards scored by a blind rater as *not negative* (0), *a bit negative* (1), *negative* (2), or *extremely negative* (3). Then, on the next page of the booklet, participants were confronted with three possible responses to the pertinent scenario. Depending on the scenario type, one of these responses either had a threatening, body-related or slightly positive content, while the other two responses were always neutral. For each response subjects had to indicate on a 100-mm Visual Analogue Scale (VAS) how likely that particular response was for them (0 = *very unlikely*; 100 = *very likely*). To control for unintended order effects, the order of the 3 VASs following each scenario and the order of the 30 scenarios in the booklet were properly randomized and counterbalanced. To examine the reliability of the open question scoring of the negativity of the scenario interpretation, a second rater was asked to score the 30 open question responses of 25 arbitrarily selected participants (i.e., 750 responses = 20.8% of total responses). Inter-rater reliability was determined by means of a crosstabs analysis with Cohen's kappa being 0.78 and 86.1% of agreement.

Eating disorder symptoms were measured with the *Eating Disorder Examination Questionnaire* (EDE-Q; Fairburn & Beglin, 1994; $\alpha = 0.95$). The EDE-Q taps symptoms of anorexia nervosa and bulimia nervosa, and yields scores on four subscales: restraint, shape concern, weight concern, and eating concern. Responses have to be given on 7-point scales (0 = *not a single day* or *totally not*; 6 = *every day* or *very much*), with higher ratings reflecting a higher frequency and/or severity of eating disorder symptoms. In the present study, a total EDE-Q score was computed by summing the four subscale scores, with higher scores reflecting higher levels of eating disorder symptomatology. Previous research has demonstrated that the EDE-Q is reliable in terms of internal consistency and test–retest stability (Luce & Crowther, 1999; Mond, Hay, Rodgers, Owen, & Beumont, 2004), and possesses good validity for measuring eating disturbances in the general population (Mond et al., 2004) as well as in clinical samples of patients suffering from eating disorders (Carter, Aimé, & Mills, 2001; Wilfley, Schwartz, Spurrell, & Fairburn, 1997). In