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The connection between disgust and obsessions and compulsions in a non-clinical sample

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Abstract

Although obsessive-compulsive patients (OCD) frequently report thoughts and compulsions about dirt and contamination, there is scarce evidence for a relationship between disgust and OCD. This study investigates whether there is a specific relationship between obsessive symptoms and disgust, independently of general psychological distress symptoms. We tested 278 non-clinical volunteers, through the Disgust Scale [Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: a scale sampling seven domains of disgust elicitors. *Personality Individual Differences*. 16, 701–713], the Padua Inventory — Revised [PI-R; van Oppen, P., Hoekstra, R. J., & Emmelkamp, M. G. (1985). The structure of obsessive-compulsive symptoms.*Behaviour Research and Therapy*, 33, 15–23], the State-Trait Anxiety Inventory [Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory (Form Y)*. Palo Alto, CA: Consulting Psychologists Press], and the Beck Depression Inventory [Beck, A. T., & Steer, R. (1987). *Beck depression inventory scoring manual. The psychological corporation*. New York: Harcourt Brace Janovich]. A multiple regression analysis showed a significant positive relationship between disgust and obsessive symptoms, after controlling for gender, age, anxiety, and depression. Washing and checking behaviors were best predicted by disgust, while impulses and rumination were best predicted by anxiety and/or depression. These findings are in line with the hypothesis of a specific relationship between disgust and at least some kinds of obsessive symptoms.

Keywords: Disgust; Obsessive-compulsive disorder; Padua Inventory-Revised, Anxiety; Depression

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1. Introduction

Power and Dalgleish (1997) have suggested that, since patients with obsessive compulsive disorders (OCD) frequently report obsessional thoughts about dirt and contamination (Rachman & Hodgson, 1980), disgust might be implicated in the genesis and maintenance of OCD. In contrast to the traditional and current classification of obsessions and compulsions, some forms of OCD might be primarily based on disgust rather than on fear and anxiety. Based on thought and behavior contents, Phillips, Senior, Fahy and David (1998) argued that cleaning disorders are strictly related to disgust, and checking disorders to anxiety, while Power and Dalgleish (1997) proposed that also checking disorders may be linked to disgust.

The evidence for a relationship between disgust and OCD is supported by clinical observations (e.g. Tallis, 1996) and by several empirical studies. For example, OCD patients show a selective impairment in recognizing facial expressions of disgust (Sprengelmeyer et al., 1997). Sensitivity to disgust is positively correlated with the washing sub-scale of the Maudsley Obsessive Compulsive Inventory (Ware, Jain, Burgess, & Davey 1994).

Furthermore, there is neuropsychological and neuroimaging evidence of abnormalities in the fronto-striatal regions in OCD (Abruzzese, Ferri & Scarone, 1997; McGuire, 1995; Rapaport, 1989). Patients show an increased metabolism and blood flow in orbito-frontal and striatal regions (Breiter & Rauch, 1996). These regions may be involved in the emotion of disgust (Gray, Young, Barker & Curtis, 1997; Sprengelmeyer et al., 1996, 1997).

In the present study, we investigated whether there is a specific relationship between obsessive symptoms and disgust in a non-clinical population, independently of general psychological distress symptoms (i.e. anxiety and depression). Our aim was to test the hypothesis that the emotion of disgust is substantially related to obsessions and compulsions, and to assess the possibility to discriminate different kinds of obsessions and compulsions based on the perception of disgust.

2. Method

2.1. Subjects

The sample included 278 volunteers (100 males and 178 females), aged 19–58 (mean = 25.5; S.D. = 8), recruited from central Italy. Eighty-four per cent of the subjects had completed at least the high school.

2.2. Measures

Subjects were requested to fill in the following tests in a balanced sequence.

2.2.1. Disgust scale

The Disgust Scale (DS; Haidt, McCauley, & Rozin, 1994) consists of 32 items measuring attitudes toward seven domains of disgust elicitors: Food, Animals, Body products, Sex, Envelope Violations, Death, and Hygiene. In addition, there is an eighth scale referring to the domain of

Magical Thinking (further details in: Haidt et al.). The DS gives a total score, from 0 (minimal disgust sensitivity) to 32 (maximal disgust sensitivity).

2.2.2. Padua Inventory — Revised version (PI-R)

The PI-R (van Oppen, Hoekstra & Emmelkamp, 1995) consists of 41 items rated on a 5-point scale according to the degree of disturbance caused by a thought or behavior (0 = "not at all" to 4 = "very much"). The PI-R gives a total score, from 0 to 164, indicating the presence of obsessive-compulsive features, and five sub-scale scores: Impulses (e.g. "While driving I sometimes feel an impulse to drive the car into someone or something"), Washing (e.g. "I feel my hands are dirty when I touch money"), Checking (e.g. "I check letters carefully many times before posting them"), Rumination (e.g. "I find it difficult to take decisions, even about unimportant matters"), and Precision (e.g. "I feel obliged to follow a particular order in dressing, undressing and washing myself").

2.2.3. State-Trait Anxiety Inventory — Form Y (STAI)

The STAI consists of two 20-item scales aiming at measuring state and trait anxiety (further details in: Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983).

2.2.4. Beck Depression Inventory (BDI)

The BDI (Beck & Steer, 1987) is a 21-item questionnaire where subjects rate themselves (on a scale from 0 to 3) according to the extent to which they exhibit cognitive, affective, somatic, and vegetative symptoms of depression (further details in: Kendall, Hollon, Beck, Hammen, & Ingram, 1987).

3. Results

Table 1 reports mean scores and standard deviations in each test, both for the whole sample and for males and females separately.

Since females may show higher scores both in the Padua Inventory (Mancini, Gragnani, Orazi, & Pietrangeli, 1999; Sanavio, 1988; van Oppen, 1992) and in the DS (Power & Dalgleish, 1997),

Table 1
Mean scores (standard deviations) obtained by males, females, and the whole group in each test, and in the Padua Inventory — Revised test (PI-R) sub-scales

	Males	Females	All subjects
Disgust	15.22 (5.32)	19.20 (4.99)	17.77 (5.45)
PI-R total score	26.71 (17.40)	38.99 (24.52)	34.41 (23.04)
Impulses	2.19 (2.80)	3.02 (3.28)	2.72 (3.14)
Washing	6.53 (5.15)	10.02 (8.19)	8.77 (7.43)
Checking	5.16 (3.93)	6.31 (5.29)	5.89 (4.87)
Rumination	7.29 (5.05)	10.51 (7.14)	9.36 (6.64)
Precision	2.37 (3.24)	2.34 (2.73)	2.35 (2.92)
State anxiety	36.20 (9.37)	38.80 (9.99)	37.87 (9.83)
Trait anxiety	38.51 (9.19)	42.33 (9.71)	40.96 (9.69)
Depression	7.32 (6.42)	8.82 (6.60)	8.28 (6.57)

Table 2
Correlations (Pearson coefficient) between the Padua Inventory — Revised test (both for the total score and for each sub-scale score), disgust, anxiety, and depression, in males (M) and females (F), partialled for age (only significant correlations ($P < 0.05$, Bonferroni correction) are displayed)

		Padua Inventory — Revised					
		Total score	Impulses	Washing	Checking	Rumination	Precision
Disgust	M	0.40	–	0.39	0.38	0.31	–
	F	–	–	0.29	–	–	–
State anxiety	M	0.45	0.47	–	–	0.53	–
	F	0.34	–	–	–	0.41	–
Trait anxiety	M	0.45	0.43	–	–	0.63	–
	F	0.51	0.45	–	–	0.65	–
Depression	M	0.55	0.46	–	–	0.55	0.35
	F	0.52	0.40	–	0.30	0.57	–

Table 3
Results from hierarchical multiple regression analysis in males[a]

	Step	Dependent variables (PI-R)					
		Total score	Impulses	Washing	Checking	Rumination	Precision
Step No. 1	R^2 (adjusted)	−0.01	0.01	0.01	0.04*	−0.01	0.01
	β for age	0.07	−0.13	0.11	0.22*	0.03	0.14
Step No. 2	R^2 (adjusted)	0.31***	0.26***	−0.01	0.10**	0.41***	0.11**
	β for Age	0.15	−0.07	0.12	0.21**	0.12	0.20*
	β for State anxiety	0.17	0.27*	0.07	0.12	0.14	−0.06
	β for Trait anxiety	0.06	0.07	−0.11	0.04	0.40**	0.03
	β for Depression	0.42***	0.26*	0.15	0.17	0.21	0.37**
Step No. 3	R^2 (adjusted)	0.41***	0.26***	0.13**	0.20***	0.45***	0.15**
	β for Age	0.11	−0.09	0.06	0.21*	0.09	0.17
	β for State Anxiety	0.16	0.27*	0.05	0.10	0.13	−0.07
	β for Trait Anxiety	0.02	0.06	−0.16	−0.01	0.37**	−0.01
	β for Depression	0.42***	0.26**	0.14	0.17	0.20	0.37**
	β for Disgust	0.33***	0.06	0.39***	0.33***	0.21**	0.23*
Multiple R		0.66	0.54	0.42	0.49	0.69	0.44
$F(5,94)$		14.84***	7.84***	4.02**	5.95***	17.04***	4.58**

[a] Regression of age (step No. 1), anxiety and depression (step No. 2), and disgust (step No. 3) on Padua Inventory — Revised test (PI-R) total scores and on each PI-R sub-scale.

*$P < 0.05$.

**$P < 0.01$.

***$P < 0.001$.

and since age is correlated with PI-R scores (Sanavio; Mancini et al.), anxiety, and depression (Pillay & Sargent, 1999), we preliminarily examined the effect of gender and age on the test scores through a multivariate analysis of covariance. Both gender [$\lambda = 0.87$; $F(5,271) = 8.3$, $P < 0.001$] and age [$\lambda = 0.92$; $F(5,271) = 4.9$, $P < 0.001$] were significant. Univariate results, correcting for age, showed that females reported higher scores in both the PI-R [$F(1,275) = 13.43$, $P < 0.001$] and the DS [$F(1,275) = 36.38$, $P < 0.001$]. Age was negatively correlated to trait anxiety [$F(1,275) = 5.88$, $P < 0.05$], depression [$F(1,275) = 9.69$, $P < 0.01$], and PI-R scores [$F(1,275) = 13.43$, $P < 0.001$]. Because of gender and age differences, subsequent analyses were conducted separately for males and females, correcting for age.

Table 2 reports significant correlations of PI-R scores with disgust, anxiety, and depression scores, partialled for age. Total PI-R scores were positively correlated with disgust only in males, and with anxiety and depression in both males and females. As to the PI-R sub-scales, the impulses sub-scale was not correlated with disgust either in males or females, but was positively correlated with trait anxiety and depression in both males and females, and with state anxiety in males. The washing sub-scale showed a positive correlation with disgust for males and females. The checking and rumination sub-scales presented a positive correlation with disgust only in males. Furthermore, checking was correlated with depression in females, while rumination was

Table 4
Results from hierarchical multiple regression analysis in females[a]

	Step	Dependent variables (PI-R)					
		Total score	Impulses	Washing	Checking	Rumination	Precision
Step No. 1	R^2 (adjusted)	0.15***	0.05**	0.04**	0.10***	0.10***	0.01
	β for Age	−0.40***	−0.24**	−0.22**	−0.32***	−0.32***	−0.10
Step No. 2	R^2 (adjusted)	0.42***	0.25***	0.08**	0.17***	0.50***	0.02
	β for Age	−0.30***	−0.16*	−0.18*	−0.24***	−0.20***	−0.06
	β for State Anxiety	0.02	0.01	0.05	−0.04	0.01	0.05
	β for Trait Anxiety	0.27**	0.32**	0.02	0.12	0.43***	0.01
	β for Depression	0.30***	0.18*	0.19	0.23*	0.24**	0.15
Step No. 3	R^2 (adjusted)	0.44***	0.25***	0.15***	0.22***	0.51***	0.02
	β for Age	−0.28***	−0.16*	−0.15*	−0.24***	−0.20***	−0.06
	β for State Anxiety	0.01	0.01	0.04	−0.05	0.01	0.05
	β for Trait Anxiety	0.24**	0.33**	−0.04	0.07	0.45***	−0.01
	β for Depression	0.32***	0.18*	0.22*	0.26**	0.25**	0.15
	β for Disgust	0.17**	−0.03	0.27***	0.23***	0.06	0.08
Multiple R		0.67	0.52	0.42	0.49	0.72	0.22
$F(5,172)$		29.03***	12.72***	7.182***	10.84***	37.30***	1.78

[a] Regression of age (step No. 1), anxiety and depression (step No. 2) and disgust (step No. 3) on Padua Inventory — Revised test (PI-R) total scores and on each PI-R sub-scale.

*$P < 0.05$.

**$P < 0.01$.

***$P < 0.001$.

correlated with anxiety and depression in both males and females. The precision sub-scale presented a significant correlation only with depression in males.

The specific contribution of disgust in predicting obsessions and compulsions was assessed through a series of hierarchical multiple regression analyses performed on PI-R total scores and on each PI-R sub-scale, after controlling for age, anxiety and depression. In the analyses (1) age was entered first, followed by (2) state and trait anxiety and depression, and (3) disgust. The results of this analysis are shown in Table 3 for males and Table 4 for females.

Disgust was a significant predictor of PI-R total scores in both males and females. Other significant predictors included depression in males, and age, trait anxiety, and depression in females. As to the PI-R sub-scales, impulses were predicted by anxiety and depression but not by disgust, while washing and checking were predicted by disgust but neither by anxiety nor (in males) by depression. Rumination and precision showed a more complex pattern. In males, disgust was a weak but significant predictor of both, together with trait anxiety (for rumination) and depression (for precision). In females, rumination was predicted only by anxiety and depression, while there was no significant predictor of precision.

4. Discussion

The aim of the present study was to investigate whether there is a specific association between disgust and obsessions and compulsions. Our findings showed that disgust is a significant predictor of obsessions and compulsions, as measured in healthy volunteers by the PI-R, even when controlling for general distress symptoms. It should be noted that this correlation does not necessarily imply that a high sensitivity to disgust is a cause of obsessive-compulsive symptoms. Furthermore, since this study was conducted on a non-clinical sample, the extension of any conclusion to clinical OCD must be done with caution. However, the possibility of such an extension is suggested by current behavioral and cognitive-behavioral theories (Rachman & Hodgson, 1980; Salkovskis, 1989), and by data on non-clinical samples (Burns, Formea, Keortge, & Sternberger, 1995), which support the notion of a continuum between normals and OCD patients, i.e. a dimensional basis of obsessions and compulsions.

Even when considering these limitations, the association between disgust and obsessive-compulsive symptoms may have important implications for clinical theory and practice. In a clinical approach, it may be very important to consider that OCD patients might be oriented towards reducing their disgust sensation rather than their anxiety. Some obsessions and compulsions, especially washing behaviors, order rituals and symmetry rituals, may be hard to explain in terms of fear (e.g. fear of becoming ill). OCD patients may claim that dirt is harmless and not dangerous for one's health. Tallis (1996) reported that washers "did not believe that contamination would result in an illness and were non worried that they might contaminate others". Their symptoms might be focussed on the idea of becoming dirty and disgusting, and be interpreted as attempts to get rid of a disgust sensation (Mancini, 1998).

The present study also suggests that disgust perception may be used to distinguish between two subgroups of obsession and compulsions. The analyses on PI-R sub-scales. showed that some sub-scales (washing and checking) were best predicted by disgust, while other ones (impulses and rumination) were best predicted by anxiety and/or depression. These results are in

line with the proposed distinction between anxiety- and disgust-based OCD (Phillips et al., 1998; Power & Dalgleish, 1997). Disgust seems to be related not only to washing disorders (Phillips et al.) but also to checking disorders (as proposed by Power & Dalgleish), while anxiety prevails in obsessive impulses and ruminations. Further studies conducted on clinical samples would be needed to investigate the role of disgust in the genesis and maintenance of OCD and to verify whether it is possible to dissociate between different OCD sub-types based on disgust perception.

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