The University Of Sheffield.

Investigating the relationship between shame and obsessive-compulsive disorder.

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Declaration

This work has not been submitted for any other degree or to any other institution.

Structure and Word Counts

Literature review

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With references and tables: 12280

Research report

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Abstract

Emerging research indicates that there is a relationship between shame and symptoms of obsessive-compulsive disorder (OCD). This thesis aimed to investigate this relationship further by firstly synthesising current research within a systematic review and meta-analysis. The second part of this thesis aimed to add to the literature by investigating the relationship between shame-proneness and obsessive intrusive thoughts (OITs), a specific symptom dimension of OCD.

The systematic review and meta-analysis synthesised data and findings from 21 eligible studies. The meta-analysis found a significant, moderate, positive correlation between shame and OCD symptoms. This relationship was supported when studies were split into subgroups based on sample type and outcome measures used. The narrative synthesis also supported these findings, with most studies finding self-reported levels of shame to be significantly higher in groups of individuals experiencing symptoms of OCD than control groups. The meta-analysis findings should be interpreted with caution due to high levels of heterogeneity.

The research study used a cross-sectional design to investigate the relationship between shame-proneness and experiences of OITs (including frequency, related distress and inferences about the self) within a non-clinical sample. Participants (n = 299) completed a battery of questionnaires online. Consistent with predictions, shame-proneness significantly predicted all OIT measures, over and above OCD symptoms. However, OCD symptoms were the strongest predictor of OIT frequency, not shame-proneness as predicted.

The implications of these findings are considered within the context of the current literature and cognitive models of OCD. Limitations, clinical applications and recommendations for future research are also highlighted.

Acknowledgements

I would firstly like to thank my supervisors Dr. Lisa-Marie Emerson and Dr. Jaime Delgadillo for their support, expertise and encouragement throughout.

I would also like to say thank you to my family and friends for their support and positivity whilst I have been working on this project. I couldn't have done it without you all!

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Part 1: Literature review

Association between shame and symptoms of obsessive-compulsive disorder. A systematic review and meta-analysis.

Abstract

Objective: Emerging evidence suggests that there is an association between shame and obsessive compulsive disorder (OCD). The current systematic review and meta-analysis aimed to formally synthesise this literature and answer the question 'Is there a significant association between shame and symptoms of OCD?'.

Method: Systematic literature searches were conducted using Psycinfo, Medline, Scopus and Web of science. Search terms included variations of the key terms 'obsessive-compulsive disorder' and 'shame' alongside names of validated measures that assess these constructs. Inclusion criteria were applied e.g. studies were required to use validated self-report measures of shame and OCD symptoms, use a quantitative methodology and adult participants. A quality assessment was completed on all eligible studies. Random effects meta-analyses and subgroup analyses were conducted on studies that reported indices of statistical association between shame and OCD. A narrative synthesis was also completed.

Results: Twenty-one studies were eligible to be included within the review. The primary meta-analysis found a significant moderate association between shame and OCD symptoms, $r = .35$ (95% CI [.30, .40]), with high levels of heterogeneity. This relationship was supported when studies were split into subgroups based on sample type and outcome measures used, however these variables were not found to explain the heterogeneity. The narrative synthesis also supported the hypothesis that there is a relationship between shame and OCD symptoms.

Conclusion: A moderate, positive and significant correlation between shame and OCD symptoms was found. However, these findings should be interpreted within the context of high heterogeneity and the poor quality of the studies included.

Practitioner points:

- It may be useful for clinicians working with individuals with symptoms of OCD to explore feelings of shame within the assessment and where appropriate include this within the understanding of the persons difficulties.
- When assessing shame using validated measures, considering the type of shame (e.g. state shame or trait shame) may be important.
- The current review should be interpreted with caution due to high heterogeneity.

Introduction

Obsessive compulsive disorder

Symptoms of obsessive-compulsive disorder (OCD) include experiencing obsessions and/or compulsions which cause major distress and have a negative impact on daily life (Diagnostic and Statistical Manual of Mental Disorders 5th edition; DSM-5; American Psychiatric Association, 2013). Obsessions can be defined as thoughts, sensations or ideas that are unwanted and reoccurring. Compulsions can be defined as repetitive behaviours that people feel driven to do to reduce distress from obsessions. Historically, OCD was classified as an anxiety disorder within the DSM-5, therefore its association with anxiety is well known and established (Poli, Melli, Ghisi, Bottesi & Sica, 2017; Weingarden & Renshaw, 2015). The DSM-5 (2013) reclassified OCD and it is now recognised under the category 'obsessive compulsive and related disorders' (OCRD) alongside hoarding disorder, trichotillomania, body dysmorphic disorder and excoriation disorder. Following OCD being reclassified, a wider range of emotions are now being recognised as being associated with OCD. For example, a conceptual review of the literature found that there is emerging anecdotal, clinical and empirical evidence to suggest there is an association between shame and OCRDs, including OCD (Weingarden & Renshaw, 2015).

Shame

Shame can be defined as a painful, self-conscious emotion that involves making global negative evaluations about the self (Tangney & Dearing, 2002). There is growing evidence showing an association between shame and numerous mental health difficulties including depression, anxiety, paranoia, psychotic symptoms and OCD (Brown, Linehan, Comtois, Murray & Chapman, 2009; Kim, Jorgensen & Thibodeau, 2011; Tangney, Wagner, & Gramzow, 1992). A recent meta-analysis (Kim, Jorgensen

& Thibodeau, 2011) investigated the link between shame, guilt and depressive symptoms and they found that shame was more strongly associated to symptoms of depression than guilt. They concluded that shame should feature more prominently within our understanding of symptoms of depression. Despite there being growing evidence for the relationship between shame and OCD, it isn't widely recognised within assessment, theory or therapeutic approaches. This may be due to the small amount of research in this area or lack of clarity about the strength and nature of this relationship.

Theoretical understanding of an association between shame and OCD

It is possible that shame may be associated with different symptom dimensions of OCD in different ways. For example, there is some evidence to suggest that individuals experience shame in relation to obsessive intrusive thoughts (OITs) by concluding that experiencing OITs means that they are a bad person in some way (McDermott, 2006; Newth & Rachman, 2001). Cognitive models of OCD suggest that the way in which an individual appraises OITs impacts on whether they cause anxiety and distress (Rachman, 2003). With this in mind, it is possible that shame may impact upon the appraisal of OITs. Alternatively, the way in which an individual appraises OITs may determine whether they experience shame. Furthering our understanding of OCD exploring its relationship with shame may help to inform interventions for OCD as well as preventative approaches.

Research has found that concealment is a common way to cope with OITs and compulsions in OCD. For example, a qualitative study found that people with a diagnosis of OCD and their families anticipated people would react negatively and reject the person with OCD, which resulted in them trying to conceal any OIT's or compulsions from others (Stengler-Wenzke, Trosbach, Dietrich & Angermeyer, 2004). Concealment and withdrawal have been found to be a barrier to accessing treatment for

people who are experiencing OCD symptoms (Marques et al. 2010; Wheaton, Sternberg, McFarlane & Sarda, 2016). It could be suggested that shame related to OCD symptoms may result in concealment and withdrawal, preventing the individual from accessing help and therefore maintaining their difficulties.

Sampling and measurement issues

There are various sampling and measurement factors that may influence the relationship between shame and OCD symptoms and will be considered within the current review. For example, in terms of sample type, differences in severity of OCD symptoms in clinical and non-clinical samples may result in different relationships with shame. The type of measures used to assess shame and OCD may also be important to consider. There are various validated self-report measures that operationalise shame in different ways. Therefore, the type of shame measures used may impact on its relationship with OCD symptoms. Finally, Measuring OCD symptoms can be complex due to its heterogeneity and high comorbidity with other mental health diagnoses (Overduin & Furnham, 2012).

The current review

The current review aims to enhance our understanding of the relationship between shame and OCD by expanding and updating Weingarden and Renshaw's (2015) conceptual review, taking a systematic approach to reviewing the literature in this area and synthesising the findings into a meta-analysis where possible. In contrast to Weingarden and Renshaw's 2015 conceptual review, the current review will focus on shame and OCD symptomology rather than all OCRDs and will not include conceptual, qualitative or case studies. The current review will also include new literature published following Weingarden and Renshaw's (2015) conceptual review.

Aims

Primary Aim

To answer the question 'Is there a significant association between shame and symptoms of OCD?'. Answering this question will involve investigating the magnitude and significance of associations between shame and OCD.

Secondary Aim

To investigate the magnitude and significance of associations in clinical and non-clinical samples. Additionally, if the data allows it, to investigate if associations differ depending on measures of shame and OCD symptoms.

Method

Search strategy

A review protocol was published in the Prospero database ahead of conducting formal searches and data extraction, outlining the plan for the current review and meta-analysis (http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018089141).

Psycinfo, Medline, Scopus and Web of science were searched during February 2018. Hand searches of reference lists (backwards searches) and studies that cited selected articles (forwards searches) were conducted for the full texts that met eligibility criteria for quality assessment.

Search terms

Variations of the key terms 'obsessive-compulsive disorder' and 'shame' were searched alongside a selection of relevant validated measures that assess these constructs. The full list of key terms and the formal search strategy is available in Appendix A. No restrictions were applied within these searches.

Inclusion and exclusion criteria

Articles were eligible for inclusion if they met the following criteria: used psychometrically reliable and validated self-report measures of both shame and OCD symptoms; used a quantitative methodology; recruited adult participants above the age of 18; were published in a peer reviewed journal. For inclusion in the meta-analysis studies were required to report the statistical association between shame and OCD at one given time point (i.e. cross-sectional design, or baseline data). For studies that met inclusion criteria but didn't present the necessary statistics to be included within the meta-analysis, the corresponding authors were contacted by e-mail in order to request this information. If this information was not provided these studies were included within a narrative synthesis. Articles were excluded if they used a single case (n =1) design, were not published in English or if they were qualitative studies.

Quality assessment

The methodological quality of the selected articles was assessed using the Downs and Black (1998) quality assessment checklist (Appendix B). This tool is recommended by the Health Technology Assessment (Deeks et al., 2003) and good practice guidance (Centre for Reviews and Dissemination [CRD], 2008). The Downs and Black (1998) checklist assesses reporting, external validity and internal validity and has been developed for assessing both randomised and non-randomised studies. Each question is answered 'yes' (1 point), 'no' (0 points), UTD (unable to determine; 0 points) or N/A (not applicable, 0 points). As suggested by best practice guidance (CRD, 2008) only questions relevant to the methodological design of the study were used to rate their quality, therefore questions that were not relevant were scored as N/A (0 points). A total score and a quality rating percentage was calculated for each study, with higher total scores and percentages indicating better quality. Studies of all qualities were

included in order to reduce bias (Mcdonagh, Peterson, Raina, Chang & Shekelle, 2013). In line with good practice guidance (CRD, 2008) an independent third year Doctor of Clinical Psychology trainee appraised 50% of randomly selected eligible studies. Inter-rater reliability was calculated using a one-way, single score, consistent intraclass correlation (ICC) in which the degree of agreement on total quality score between rater 1 and rater 2 was calculated. Any inconsistencies were discussed and resolved.

Statistical analyses

A meta-analysis was performed with eligible studies in order to synthesize the indices of association between shame and OCD and to produce a weighted effect size (Borenstein, Hedges, Higgins & Rothstein, 2009). An online 'R' software package (MAVIS: Meta-Analysis via Shiny, version 1.1.3; Hamilton, Aydin & Mizumoto, 2016) was used to conduct the meta-analysis. A random-effects model was used as the data were from a range of studies that differed based on study characteristics (Borenstein et al., 2009). If presented in the study, statistical indices of associations (correlation coefficients) between shame and OCD measures were extracted. Correlation coefficients between shame and OCD measures were converted to Fishers z scale and the analysis was conducted using these converted values (Borenstein et al., 2009). Cohen's (1988) guidelines were followed to interpret the strength of the relationships, with correlation coefficients of .1 representing a small association, coefficients of .3 representing a moderate association and coefficients of .5 representing a large association.

The heterogeneity of studies included in the meta-analysis was estimated using the Q and I^2 statistics. The Q statistic is the weighted sum of squares on a standardized scale, measuring the variation around the average. If the Q statistic is significant, this indicates that the true effects vary. It has been suggested that a 10% cut-off for

significance (p = .10) should be used for the Q statistic to help reduce the risk of a type 1 error (Higgins, Thompson, Deeks, & Altman, 2003). The I^2 statistic captures the percentage of variation across the studies that can be explained by heterogeneity rather than chance (Higgins et al., 2003). The Cochrane consumers and communication review group general guidelines (2016) were used in the interpretation of I^2 values, with values between 0%-40% considered as low or not important, values between 40%-60% representing moderate heterogeneity, values between 60%-90% representing substantial heterogeneity and values above 90% representing considerable heterogeneity.

Publication bias was assessed statistically, using a regression test (Egger, Davey Smith, Schneider, & Minder, 1997) which assesses funnel plot asymmetry. Additional tests of publication bias included a fail-safe analysis (Rosenthal, 1979) and a rank correlation test (Begg & Mazumdar, 1994).

In order to address secondary aims and to further explore heterogeneity of the included studies in line with good practice guidance (CRD, 2008), subgroup analyses were conducted. This included splitting studies into subgroups based on sample types and on which shame and OCD measures were employed. The weighted effect size was then observed for each subgroup. Statistical tests for publication bias were not completed on the subgroup data as they can only be applied when there are more than 10 studies (Higgins & Green, 2011). An analogue to the ANOVA was then conducted for each subgroup analysis to see if any of the subgroup categorical variables (sample type, shame measures, OCD measures) could explain the variability within the effect sizes in primary analysis (Lipsey & Wilson, 2001). The analogue to the ANOVA split the total variance into variability between groups (Qb) and within groups (Qw). If the Qb value was significant, this indicated that the categorical variable in question is sufficient in explaining (moderating) the overall variance in the effect size between the groups. The Qw indicates whether the pooled within group variance is homogenous or

not. Therefore, when comparing independent group variables, if the majority of the total heterogeneity is found between-groups and little remains within groups, this variable would be found to account for some of the heterogeneity within the primary analysis (Cooper, Hedges & Valentine, 2009).

Results

Search results

Electronic searches identified 416 studies (PsycINFO = 119, Web of Science =108, Scopus = 131, Medline = 58). The duplicates were removed (k = 204) leaving 212 abstracts to be screened for eligibility. Following the abstract screening, 106 studies were excluded. The remaining full texts (k =46) were screened using inclusion and exclusion criteria listed above and a further 30 were excluded. Hand searches identified a further 5 eligible articles, resulting in 21 studies being included in the quality assessment. Out of these, 14 studies met eligibility criteria to be included in the meta-analysis, and 7 studies met eligibility criteria to be included within the narrative review. This search process is presented in Figure 1.

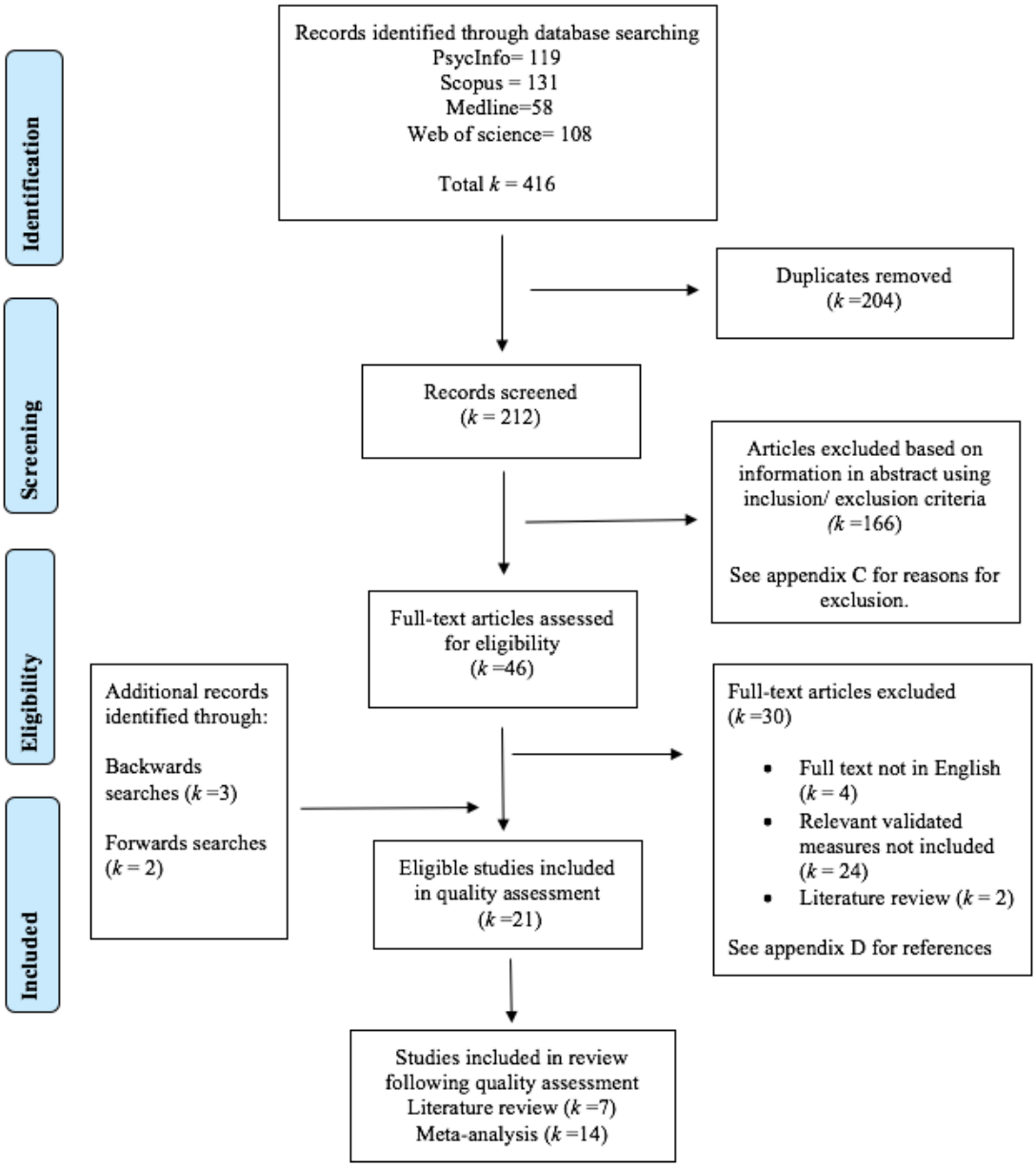

Figure 1. PRISMA flow diagram (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2010)

Data extraction and summary of study characteristics

Study and sample characteristics are presented in Table 1. The studies were conducted in various counties including Greece (k = 1), USA (k = 14), South Korea (k = 2), South Africa (k = 1), Iran (k = 2) and Norway (k = 1). Studies recruited either a clinical sample (k = 10), a non-clinical sample (k = 7) or both (k = 4). Most of the studies were cross-sectional in design (k = 18), however there were some quasi-experimental (k = 2) and experimental studies (k = 1).

In terms of measures of shame, the majority of studies (k = 9) used the Test of Self Conscious Affect (TOSCA; Tangney et al., 1989). Other measures of shame used included the other as shamer scale (OAS; Goss, Gilbert & Allan, 1992; k = 3), the experience of shame scale (ESS; Andrews, Qian & Valentine, 2002; k = 3), the state shame and guilt scale (SSGS; Marschall, Saftner, & Tangney, 1994; k = 2), the personal feelings questionnaire (PFQ; Harder & Zalma, 1990; k = 1) and the self-conscious affect and attribution inventory (SCAII; Tangney, Burggraf, Hamme & Domingos, 1988; k = 1). Some studies (k = 6) used the shame subscale of the young schema questionnaire (YSQ; Young, Klosko & Weishaar, 2003).

A range of measures were also employed to measure OCD symptoms with the majority of studies using the Yale-Brown obsessive compulsive scale (Y-BOCS; Goodman et al., 1989; k = 9). Other measures used included the obsessive compulsive inventory- revised (OCI-R; Foa et al., 2002; k = 5), the schedule of compulsions, obsessions and pathological impulses (SCOPI; Watson & Wu, 2005; k = 1), the dimensional obsessive-compulsive scale (DOCS, Abramowitz et al., 2010; k = 2), the obsessive belief questionnaire (OBQ; OCCWG, 2005; k = 1) and the Padua inventory (Burns, Formea, Keortge & Sternberger, 1995; k = 1). Studies also used the OCD subscale of the SCL-90 to measure OCD symptoms (SCL-90; Derogatis & Cleary, 1977; k = 3). Some studies included numerous measures of shame and OCD symptoms.

Studies highlighted with a * in table 1 were eligible to be included within the meta-analysis and the correlation coefficient (r) between shame and OCD symptoms was extracted from these studies. It is important to note that some studies (e.g. Tangney & Dearing, 2002; Tangney et al., 1992) are presented as one study within Table 1 and the quality appraisal. However, due to presenting numerous outcomes from different participant samples within each paper, they were included as separate samples within the meta-analysis.

Table 1

Study Characteristics

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Alexias & Togos* (2016)	Greece	Cross-sectional	2313	Nonclinical, community sample	31	70.8	ESS OAS	OCI-R	ESS= .23 OAS = .60 Both significant $p < .01$ Mean = **.415**	-
Block* (2016)	USA	Cross-sectional	59	Clinical sample, scored 8 or higher on the Y-BOCS.	-	-	ESS OAS Total shame (ESS+OAS)	Y-BOCS	ESS = .582 OAS = .516 Total shame = **.579** All significant $p <$ 0.001	-
Fergus, Valentiner, McGrath & Jencius* (2010);	USA	Cross-sectional	124	Clinical sample, with a primary diagnosis of an anxiety disorder	29.2	54	TOSCA	OCI-R	**.27** Non-significant.	-
Fergus & Valentiner* (2012)	USA	Experimental	92	Nonclinical, undergraduate sample	19.7	59.8	SSGS	SCOPI	**.27** Significant $p < 0.01$	-

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Haaland, Vogel, Launes, Haaland, Hansen, Himle* (2011)	Norway	Quasi-experimental	88	Clinical sample, with a diagnosis of OCD	34.4	72.7	YSQ shame subscale	Y-BOCS	Pre-treatment correlation = .**07** Not significant	_
Hezel, Riemann & McNally (2012)	USA	Quasi-experimental	20	Clinical group with a diagnosis of OCD	25.65	55	SSGS	Y-BOCS	_	The OCD group scored significantly higher in shame than the healthy control group.
			25	Healthy control group	30.6	44				
Kim, Lee & Lee (2014)	South Korea	Cross – sectional	57	Clinical group with a diagnosis of OCD	26.7	33	YSQ shame subscale	Y-BOCS	_	The OCD group had significantly higher scores for schema related to shame than the control group. No significant correlations were found between shame and specific OCD symptom dimensions.
			70	Healthy control group	25.5	30				
Kwak & Lee (2015);	South Korea	Cross – sectional	51	Clinical sample with a diagnosis of OCD.	28	31	YSQ shame subscale	Y-BOCS	_	The OCD group had significantly higher scores for schema related to shame than the control group.
			70	Healthy control group.	25.5	30				

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Olatunji & Cox* (2015)	USA	Cross – sectional	403	Nonclinical, undergraduate sample	19.59	67	OAS	OCI-R	**.34** Significant $p < .01$	_
Singh, Wetterneck, Williams & Knott* (2016)	USA	Cross - sectional	152	Clinical sample, self-reported OCD (n=152)	_	_	ESS	DOCS	**.20** Significant $p < 0.05$	_
Valentiner & Smith (2008)	USA	Cross – sectional	690	Nonclinical, undergraduate sample	18.7	61.3	TOSCA	OCI-R	_	Obsessions were more strongly related to compulsive behaviours in people who were higher in shame proneness.
Weingarden & Renshaw* (2014)	USA	Cross - sectional	263	Nonclinical, undergraduate sample	21.06	77.6	TOSCA	OBQ	**.34** Significant, $p < .001$	_
Weingarden, Renshaw, Wilhelm, Tangney & DiMauro (2016)*	USA	Cross - sectional	93	Clinical sample, self reported OCD	30.6	86	TOSCA	Y-BOCS	**.22** $p < 0.05$ *Note:* this was additional data provided by the author.	

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Weingarden, Renshaw, Tangney & Wilhelm (2016)	USA	Cross-sectional	80	Clinical group, with a diagnosis of OCD	29.8	83.8	TOSCA	OCI-R Y-BOCS	_	Higher shame in OCD group than healthy control (although only means presented).
			124	Healthy control group	36.7	73.4				
Wetterneck, Singh & Hart (2014)	USA	Cross - sectional	90	Clinical sample, self-reported clinical levels of OCD	35.64	74.7	TOSCA	DOCS	_	Shame was significantly correlated with OCD symptom dimensions harm (r = 0.41) and symmetry (r = 0.35) $p < 0.01$
Yoosefi et al.* (2016)	Iran	Cross – sectional	50	Clinical sample with a diagnosis of OCD	_	_	YSQ shame subscale	Padua inventory	**0.54** Significant, p < 0.001	_
Tangney, Wagner & Gramzow* (1992)	USA	Cross - sectional	*Study 1:* 245	Nonclinical, undergraduate sample	21.1	71	SCAAI	SCL-90 (OCD subscale)	SCAAI = **.31** Significant, p < 0.001	_
			Study 2: 234	Nonclinical, undergraduate	19.5	*72*	TOSCA SCAAI	SCL-90 OCD subscale	TOSCA= .38 SCAAI= .38 Mean = **.38** Significant, $p < 0.001$	_

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Lochner, Seedat, Toit, Nel, Niehaus, Sandler, Stein (2005)	South Africa	Cross-sectional	278	Clinical sample, with a diagnosis of OCD.	33.1	46	YSQ shame subscale	Y-BOCS	_	OCD participants scored significantly higher on the shame schema than individuals with TTM.
			54	Clinical sample with a diagnosis of TTM.	31.3	90.7				
Averill, Diefenbach, Stanley, Brekenridge, Lusby* (2002);	USA	Cross-sectional	82	Clinical sample	33.32	51	TOSCA PFQ	SCL-90 OCD subscale	TOSCA = .35 PFQ = .50 Significant $p < 0.001$ Mean = **.425**	_
Tangney and Dearing* (2002)	USA	Cross-sectional	*Study 1:* 254	Nonclinical, undergraduate sample.	_	_	TOSCA	SCL-90 OCD subscale	**.31** Significant $p < .001$	_
			Study 2: 158	Nonclinical, undergraduate sample.	_	_	TOSCA	SCL-90 OCD subscale	**.40** Significant $p < .001$	_
			Study 3: 252	Nonclinical, undergraduate sample.	_	_	TOSCA	SCL-90 OCD subscale	**.34** Significant $p < .001$	_

Author and year of publication	Country	Study design	Sample characteristics				Shame measure	OCD measure	Correlations (*r*) between shame and OCD measures	Results when correlations weren't presented
			N	Population	Age (M)	Female %				
Shariatzadeh (2017)	Iran	Cross-sectional	52	Clinical sample of individuals with a diagnosis of OCD	25.34	48.1	YSQ shame subscale	Y-BOCS	**.655** Significant $p < .001$	_

Note: Correlation coefficients in boldface were included in the primary meta-analysis. Cells marked with a dash indicate that this information was either unavailable or unapplicable. ESS = the experience of shame scale (Andrews, Qian & Valentine, 2002); OAS = other as shamer scale (Goss, Gilbert & Allan, 1992); OCI-R = obsessive compulsive inventory- revised (Foa et al., 2002); Y-BOCS = Yale-Brown obsessive compulsive scale (Goodman et al., 1989); SCOPI = the schedule of compulsions, obsessions and pathological impulses (Watson & Wu, 2005); YSQ = young schema questionnaire (Young, Klosko & Weishaar, 2003); SSGS= state shame and guilt scale (Marschall, Saftner, & Tangney, 1994); DOCS = the dimensional obsessive-compulsive scale (Abramowitz et al., 2010); TOSCA = Test Of Self Conscious Affect (Tangney et al., 1989); OBQ = obsessive belief questionnaire (OCCWG, 2005); PFQ = Personal feelings questionnaire (Harder & Zalma, 1990); SCAAI = the self-conscious affect and attribution inventory (Tangney, Burggraf, Hamme & Domingos, 1988);TTM= trichotillomania.

Assessment of methodological quality results

The ICC estimate was 0.298, 95% CI [.75, .98] suggesting that the interrater reliability was excellent (Koo & Mae, 2016). Discussions were held between the first author and independent rater over any discrepancies and a mutual decision about scoring was made. The outcomes of the quality assessment are presented in Table 2.

As most of the studies had a cross-sectional design, questions related to intervention studies included in the Downs and Black (1998) checklist were not applicable (N/A) to the majority of studies included. These questions were left in the checklist due to them being relevant to other studies in the current review and to preserve the validity of the Down's and Black (1988) checklist.

The cross-sectional design of the majority of the studies resulted in quite low overall total quality ratings. O'Connor et al. (2015) suggested that total scores between 24-27 could be deemed "excellent", scores between 19–23 deemed "good", scores between 14–18 deemed "fair" and studies with a total score of less that 14 deemed "poor". Using this guide, 19 of the included studies were deemed "poor". This is largely due to questions relating to intervention studies/ randomized controlled trials being not applicable, as well as the design of these studies being generally of a poorer quality.

Despite some studies having large sample sizes, none of the studies outlined a power calculation and which made it difficult for the reader to determine whether they were sufficiently powered. Additionally, it was often difficult to determine how representative the sample was due to authors not outlining the source population.

Most studies strengths were that they were clear about the aims of the study and outcome measures used. Additionally, any 'data dredging' was often made clear and appropriate statistical tests were employed. Finally, the outcome measures used were often demonstrated to be reliable and valid.

The study by Tangney & Dearing (2002) received the lowest quality score of 1. This is due to the authors presenting relevant statistics and including information about numbers of participants and outcome measures within the appendices of a book, but providing limited details about methodology.

Table 2

Quality Assessment

Checklist Questions	Alexias & Togos (2016)	Block (2016)	Fergus et al. (2010)	Fergus & Valentiner (2012)	Haaland et al. (2011)	Hezel, Riemann &	Kim, Lee & Lee (2014)	Kwak & Lee (2015)	Olatunji & Cox (2015)	Singh et al (2016)	Valentiner & Smith (2008)
1 Are the aims/objectives clear?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2 Are the main outcomes to be measured clearly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3 Are the characteristics of the participants described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4 Are the interventions clearly described?	N/A	N/A	N/A	Yes	Yes	No	N/A	N/A	N/A	N/A	N/A
5 Are distributions of confounders clearly described?*	P (1)	P (1)	P (1)	P (1)	P (1)	P (1)	P (2)	P (2)	P (2)	P (1)	P (1)
6 Are the main findings clearly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7 Are estimates of random variability provided?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8 Have adverse events been measured/ reported?	N/A	N/A	N/A	No	No	No	N/A	N/A	N/A	N/A	N/A
9 Have participants lost to follow up been described?	No	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
10 Have actual probability values been reported?	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
11 Were subjects asked to participate representative?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
12 Were subjects who participated representative?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
13 Was the intervention representative of standard treatment?	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
14 Was an attempt made to blind participants?	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15 Was an attempt made to blind the researcher?	N/A	N/A	N/A	UTD	UTD	N/A	N/A	N/A	N/A	N/A	N/A
16 Were any differences in follow up adjusted for?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17 Was any 'data dredging' made clear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18 Were the statistical tests used appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19 Was compliance with intervention reliable?	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
20 Were the main outcome measures used accurate?	Yes	Yes	Yes	Yes	Yes	UTD	Yes	Yes	Yes	Yes	Yes
21 Were participants recruited from the same population?	N/A	N/A	N/A	Yes	No	No	N/A	N/A	N/A	N/A	N/A
22 Were participants recruited over the same period of time?	N/A	No	UTD	UTD	UTD	UTD	UTD	UTD	UTD	Yes	UTD
23 Were participants randomised to intervention groups?	N/A	N/A	N/A	Yes	No	No	N/A	N/A	N/A	N/A	N/A
24 Was randomization concealed?	N/A	N/A	N/A	UTD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25 Was there adjustment for confounding in the analysis?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26 Were losses of patients to follow up considered?	UTD	N/A	N/A	N/A	UTD	N/A	N/A	N/A	N/A	N/A	N/A
27 Did the study have sufficient power?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
Total score	10	10	12	14	15	10	13	12	12	11	10
Quality %	37%	37%	44%	51%	55%	37%	48%	44%	44%	40%	33%

Note. See appendix B for full version of Downs and Black appraisal tool questions; Yes (1 point); No (0 points); UTD = Unable to Determine (0 points); N/A= Not applicable (0 points) * Different scoring for question 5 - Yes (2 points), P= Partially (1 point) No (0 points)

Checklist Questions	Weingarden & Renshaw (2014)	Weingarden et al. (2016)	Weingarden et al. (2016)	Wetterneck, Singh & Hart (2014)	Yoosefi et al (2016)	Tangney et al (1992)	Lochner et al (2005)	Averill et al (2002)	Tangney & Dearing (2002)	Shariatzadeh (2017)
1 Are the aims/objectives clear?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
2 Are the main outcomes to be measured clearly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
3 Are the characteristics of the participants described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
4 Are the interventions clearly described?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5 Are distributions of confounders clearly described?*	P (1)	P (1)	P (1)	P (1)	P (1)	P (1)	P (1)	P (1)	No	P(1)
6 Are the main findings clearly described?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
7 Are estimates of random variability provided?	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
8 Have adverse events been measured/ reported?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9 Have participants lost to follow up been described?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10 Have actual probability values been reported?	Yes	Yes	Yes	No	Yes	No	Yes	No	No	No
11 Were subjects asked to participate representative?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
12 Were subjects who participated representative?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
13 Was the intervention representative of standard treatment?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14 Was an attempt made to blind participants?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15 Was an attempt made to blind the researcher?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16 Were any differences in follow up adjusted for?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17 Was any ‘data dredging’ made clear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	UTD	Yes
18 Were the statistical tests used appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19 Was compliance with intervention reliable?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20 Were the main outcome measures used accurate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	UTD	Yes
21 Were participants recruited from the same population?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22 Were participants recruited over the same period of time?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	Yes	UTD	Yes
23 Were participants randomised to intervention groups?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24 Was randomization concealed?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25 Was there adjustment for confounding in the analysis?	Yes	No	Yes	UTD	Yes	Yes	Yes	Yes	UTD	Yes
26 Were losses of patients to follow up considered?	N/A	UTD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27 Did the study have sufficient power?	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD	UTD
Total score	11	10	11	9	11	9	11	11	1	11
Quality %	40%	37%	40%	33%	40%	33%	40%	37%	3%	40%

Note. See appendix B for full version of Downs and Black appraisal tool questions; Yes (1 point); No (0 points); UTD = Unable to Determine (0 points); N/A= Not applicable (0 points) 1-26

* Different scoring for question 5 - Yes (2 points), P= Partially (1 point) No (0 point)

Meta-analysis

Fourteen studies presented the relevant statistics (or the authors sent the relevant statistics) to be included within the meta-analysis. Tangney et al. (1992) presented two separate studies using different samples within their paper, both of which were included within the meta-analysis. Similarly, Tangney and Dearing (2002) presented three separate studies using three different samples, which were also included within the meta-analysis. Therefore despite 14 studies being eligible for the meta-analysis, 17 independent samples were included within the meta-analysis.

If multiple correlations were presented between relevant measures using the same sample, a mean of these outcomes were calculated and included in the meta-analysis (Borenstein et al., 2009; Lipsey & Wilson, 2001; Rosenthal, 1991). In the subgroup analyses that organise groups using measures, the correlation using the primary measures was included.

Primary meta-analysis - Is there a significant association between shame and symptoms of OCD?

The primary meta-analysis included 17 eligible samples and 4914 participants. The majority of these (12/17) reported moderate-to-large (Cohen, 1988) positive and significant correlations between shame and OCD symptoms. Other studies found a small-to-moderate significant correlation (4/17) and one study found small, non-significant correlations (1/17). The smallest correlation was $r = 0.07$ (Haaland et al., 2011) and the largest was $r = .65$ (Shariatzadeh, 2017).

The overall sample weighted effect size between shame and OCD symptoms was $r = .35$ (95% CI [.30, .40]) and significant ($p < .001$) suggesting an overall medium, significant correlation between shame and OCD (Cohen, 1998). However, the Q statistic was significant, indicating that the true effects were varied $Q(16) = 43.15$, $p <$

.0001 and the I^2 (63%) statistic showed that there was substantial heterogeneity across the included studies that was not due to chance. This is demonstrated visually in the confidence interval overlaps on the forest plot (Figure 2). Due to the substantial amount of heterogeneity between the studies, the sample weighted relationship should be interpreted with caution (CRD, 2008).

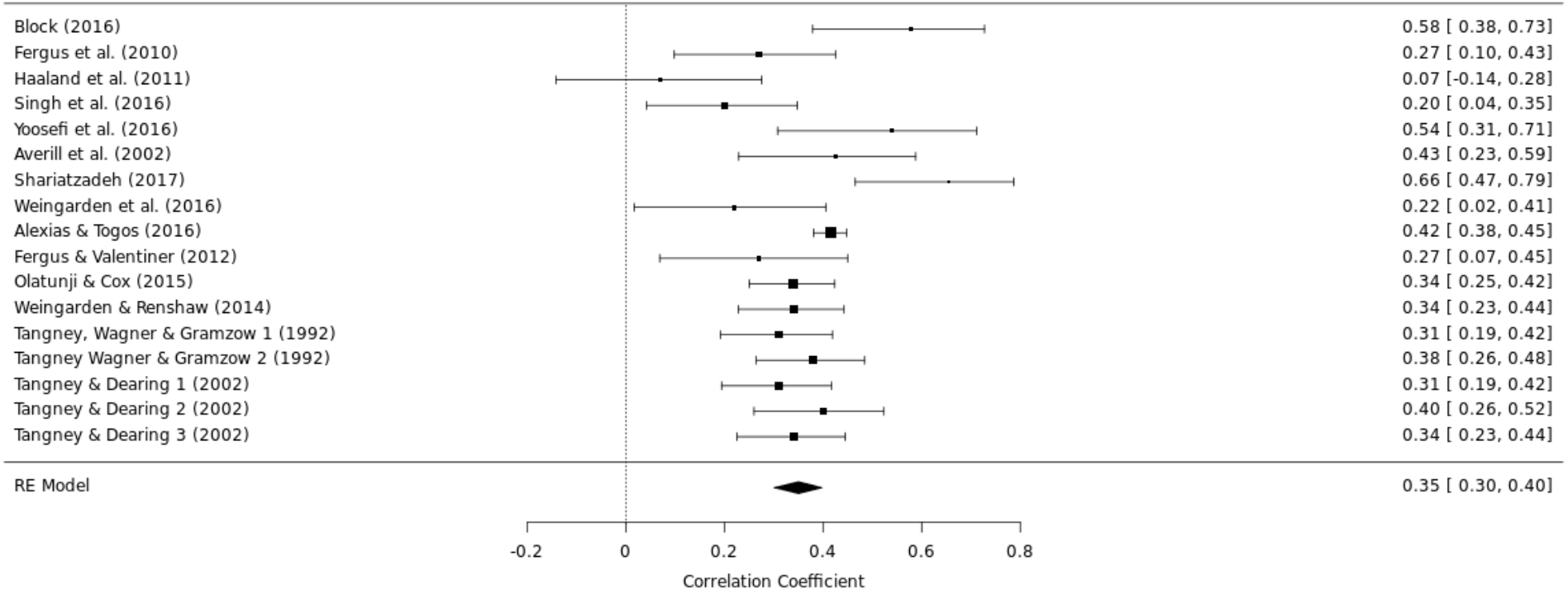

Figure 2. Primary meta-analysis forest plot.

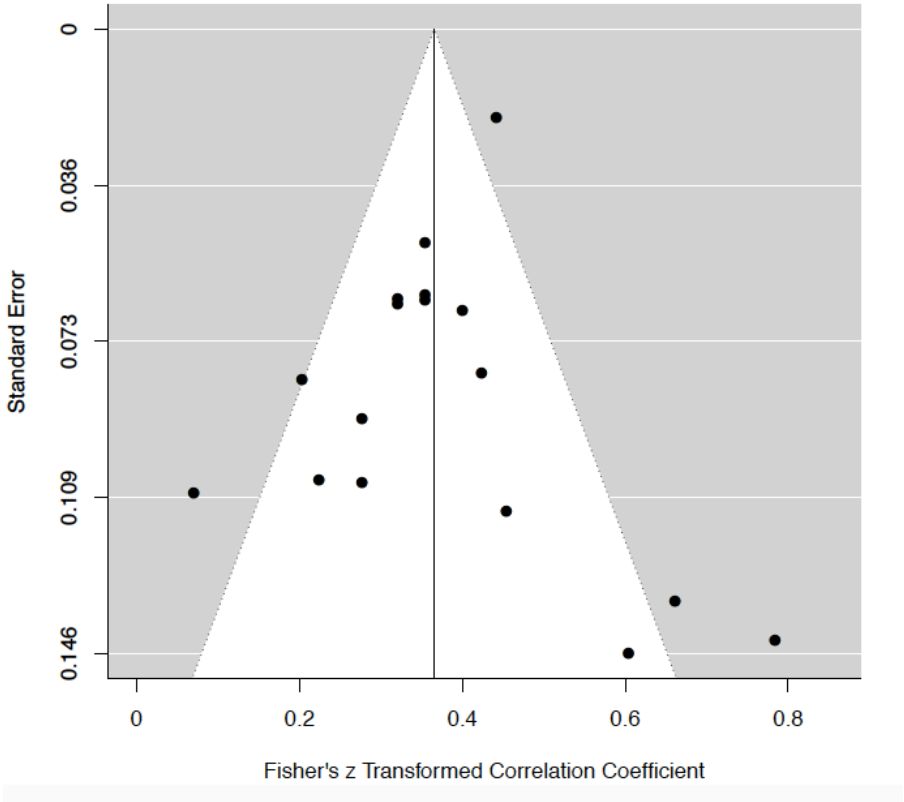

Figure 3. Primary meta-analysis funnel plot.

The funnel plot (Figure 3) was assessed for publication bias. Visual inspection of this indicates that its slightly asymmetrical suggesting there is some risk of reporting bias. However, a regression test for funnel plot asymmetry (Egger et al., 1997) was not significant ($p = 0.28$) suggesting that there was no evidence of publication bias. A fail-safe analysis (Rosenthal, 1979) was also completed and asserted that 3013 non-significant studies would be necessary to have an impact on the significance of the results of the meta-analysis (Oswald & Plonsky, 2010). Finally, a rank-correlation test (Begg & Mazumdar, 1994) showed a low correlation, indicating that the funnel plot is largely symmetrical (Kendalls Tau = 0.1, $p = 0.6$). Overall, tests for publication bias suggest that publication bias was not impacting upon the effect size within the meta-analysis.

Secondary analyses

Secondary, subgroup analyses were pre-planned based on the literature. Additionally, subgroup analyses allowed exploration of the substantial amount of heterogeneity found within the primary meta-analysis. This allowed potential moderators of the heterogeneity to be explored (CRD guidance, 2008). The studies were split into groups based on categorical study characteristics such as comparing studies that used a clinical population with those that used a non-clinical population. Subgroup analyses also compared studies that used different measures of shame and OCD. The outcomes of these described below and presented in Table 3. For studies that used multiple measures of shame and OCD, the primary measure was selected to use within subgroup analyses based on measures used.

Subgroup and moderator analyses based on sample type

There was a significant, moderate mean weighted effect size between shame and OCD in both the clinical sample $r = .35$ (95% CI [.26, .43]) $p < .001$ and the non-clinical sample r = .35 (95% CI [.28, .41]), $p < .001$. The overlapping confidence intervals and similar mean weighted effect suggests that there are no clear differences between effect sizes of studies that used a clinical sample vs studies that used a non-clinical sample. The clinical sample subgroup showed high levels of heterogeneity, $Q(6) = 34.29$, $p < .001$, $I^2 = 79\%$, and so these outcomes should be interpreted with caution. However, the non-clinical sample subgroup had low heterogeneity, $Q(8) = 10.4535$, $p = .23$ and the $I^2 = 23\%$, suggesting that studies within the non-clinical subgroup were more consistent. This is demonstrated visually in figure 1 as the top 8 studies used a clinical sample and show more variability.

The heterogeneity between and within clinical and non-clinical subgroups were calculated using an analogue to ANOVA (Lipsey & Wilson, 2001). The heterogeneity

between subgroups was not significant Qb(1) = 0.0018, $p = 0.96$ suggesting that the sample type (clinical or non-clinical) does not explain or moderate the heterogeneity found within the main meta-analysis. Most of the variance was explained within the subgroups rather than between them.

Subgroup and moderator analyses based on shame measures

The studies were organised into subgroups depending on the shame measure used. The most frequently used measure was the TOSCA. There was a significant, moderate mean weighted effect size between the TOSCA and OCD symptoms, $r = .33$ (95% CI [.24, .41]), $p < .001$. Additionally, tests of heterogeneity indicated that studies within this subgroup were homogenous Q(7) = 3.74, $p = .80$, $I^2 = 0\%$. This therefore suggests that the summary effect of $r = .33$ was consistent across the studies that used the TOSCA.

The studies that used the ESS and the YSQ to measure shame also formed separate subgroups. Significant, moderate mean weighted effect sizes were found for both the ESS $r = .30$ (95% CI [.15, .44), $p < .001$ and the YSQ $r = .41$ (95% CI [.24, .56), $p < .001$**.** However, there was substantial heterogeneity within both the ESS subgroup Q(2)=10.41, $p < 0.05$, $I^2 = 81\%$ and the YSQ Q(2) = 18.43, $p < 0.001$, $I^2 = 89\%$, indicating that these outcomes should be interpreted with caution.

The OAS, SCAII and SSGS were only used in one study and therefore subgroups were unable to be formed for these studies. The similar mean weighted effect sizes and large overlaps in confidence intervals for the shame measure subgroups suggests no clear differences in effect size based on the type of shame measure used. An analogue to the ANOVA (Lipsey & Wilson, 2001) test was completed to investigate the variability explained within and between subgroups, the Q between subgroups statistic was not significant Q(2) = 1.088 $p = 0.58$, suggesting that these subgroups do not

explain or moderate heterogeneity in the primary meta-analysis. Most of the variance was explained within the subgroups rather than between them.

Subgroup and moderator analyses based on OCD measures

Seven different measures of OCD were employed within the 17 studies. The studies were grouped depending on the OCD measure used. The SCL-90 was the measure most frequently employed, there was a mean weighted moderate, significant association between the SCL-90 and shame, $r = .36$ (95% CI [.27, .44]) $p < .001$. Additionally, within this subgroup the Q statistic was non-significant, indicating that the true effects were not varied $Q(5) = 2.44$, $p = .78$ and the I^2 (0%) statistic showed that there was no heterogeneity across the studies that used the SCL-90 to measure OCD-symptoms.

The studies that used the OCI-R and the Y-BOCs to measure OCD symptoms also formed separate subgroups. A moderate, significant mean weighted effect was found for both the OCI-R studies, $r = .35$ (95% CI [.24, .46), $p < .00$, and the Y-BOCs $r = .37$ (95% CI [.23, .49), $p < .001$. However substantial heterogeneity was found for both the studies that used the OCI-R, $Q(2) = 5.2$, $p = 0.07$, $I^2 = 62\%$ and the Y-BOCS $Q(2) = 22.7$, $p < 0.001$, $I^2 = 87\%$.

The DOCS, OBQ, Padua inventory and SCOPI were only used in one study and so subgroups were unable to be formed for these measures. The similar weighted effect sizes and overlapping confidence intervals between the groups suggests that the type of OCD measure used does not impact upon the effect size. An analogue to the ANOVA (Lipsey & Wilson, 2001) test was completed to compare the variability explained within and between subgroups the Q between subgroups statistic was not significant $Q(1) = 0.042$, $p = 0.97$ suggesting that these subgroups do not fully explain or moderate

heterogeneity in the primary meta-analysis. Most of the variance was explained within the subgroups rather than between them.

Table 3

Subgroup moderator analyses

Moderator	N	k	*r*	95% CI	I^2	Q	Q Within	Q between
Sample								
Clinical	607	8	.36*	[.27, .45]	79%	29.04*		
Non-clinical	4214	9	.35*	[.28, .41]	23%	10.45		
All sample subgroups						43.15*	39.49*	0.08
Shame measure								
ESS	2524	3	.30*	[.15, .44]	81%	10.41*		
TOCSA	1460	9	.33*	[.24, .43]	0%	3.74		
YSQ	291	3	.41*	[.24, .56]	89%	18.43*		
All shame measure subgroups						45.62*	32.59*	1.08
OCD measures								
OCI-R	2840	3	.35*	[.24, .46]	62%	5.28*		
SCl-90	1225	7	.35*	[.26, .43]	0%	2.44		
Y-BOCS	439	4	.52*	[.23, .50]	87%	22.7*		
All OCD measure subgroups						33.7*	33.42*	0.98

Note: *$p < 0.05$

Studies that did not report indices of association

Studies that did not provide statistical indices of association between key variables did not meet the eligibility criteria for the meta-analysis. However, in order to investigate any impact of these studies on the meta-analysis, the effect sizes from these studies were calculated where possible (Appendix E). As these effect sizes were derived from different statistical variables, combining them in the same analysis has been deemed questionable and so this was done cautiously (Lipsey & Wilson, 2001). The effect sizes were able to be calculated and transformed into *r* for four of the seven studies (Hezel et al., 2012; Kim et al., 2014; Kwak & Lee, 2016; Weingarden et al., 2016). The effect size was calculated and transformed based on one continuous and one dichotomous variable (means and standard deviations of shame scores from an OCD group and a control group). It was found that the addition of these studies to the primary

analysis increased the overall mean weighted effect size $r = .42$ (95% CI [.34, .50]) $p < .001$, however it also increased the heterogeneity within the meta-analysis $Q(20) = 108$, $p < .001$, $I^2 = 81.5\%$.

A subgroup analysis was conducted in order to explore any differences between studies in which the effect sizes had been calculated and studies in which the effect size was presented within the paper. A large, significant mean weighted effect size was found for the studies with the transformed effect sizes $r = .65$ (95% CI [.57, .71]) which was larger than the moderate effect size found for the studies within the primary analysis $r = .35$ (95% CI [.30, .40]). Additionally, a moderator analysis (Lipsey & Wilson, 2002) showed that the variability explained between groups was significant $Q(1) = 32.93$, $p = 0.00$. This suggests that the groups differed by more than the sampling error and the type of effect size used explained some of the heterogeneity within this meta-analysis. Therefore, due to differences between studies with original and transformed effects they were synthesized separately (Polanin & Snilstveit, 2016). This is in line with suggestions that different types of data with underlying differences in the metric used may not be comparable and thus unable to be combined (Morris & Deshon, 2002). Despite not including these studies within the analysis, it is useful to note that they supported an association between shame and OCD.

Narrative synthesis of studies not included in the meta-analysis

Due to not presenting the statistical association between shame and OCD measures, 7 studies were not included within the meta-analyses (Hezel et al., 2012; Kim et al., 2014; Kwak & Lee, 2016; Lochner et al., 2005; Valentiner & Smith, 2008; Weingarden et al., 2016; Wetterneck et al., 2014). However, these studies continue to be relevant to the research question and were therefore summarised in a narrative form.

The majority ($k = 5$) of the studies not included within the meta-analysis compared shame scores between an OCD group and either another clinical sample or a

control group. (Hezel et al., 2012; Kim et al., 2014; Kwak & Lee, 2016; Lochner et al., 2005; Weingarden et al., 2016;). All five studies found that the OCD group scored significantly higher on shame measures when compared to either a healthy control or a clinical control. These findings suggest that higher levels of shame are linked with severe or clinical levels of OCD symptoms, supporting the hypothesis that there is an association between shame and OCD symptoms.

Two studies looked at the relationship between shame and separate obsessive and compulsive symptom dimensions (Kim et al., 2014; Wetterneck et al., 2014). Wetterneck et al., 2014 found a significant, positive correlation between shame and OCD symptoms relating to both harm and symmetry. However, there was no significant relationships found between shame and OCD symptoms related to contamination or unacceptable thoughts. Kim et al. (2014) did not find any significant correlations between any symptom dimensions (measured by the Y-BOCS) and the shame maladaptive schema (measured by the YSQ). Therefore, providing mixed results around the relationship between specific symptom dimensions and shame. Finally, Valentiner and Smith (2008) found that obsessions were more strongly associated to compulsions in individuals with high levels of shame proneness, suggesting that shame plays a key part within OCD symptoms.

To measure shame, three studies used the YSQ (Kim et al., 2014; Kwak & Lee, 2015; Lochner et al., 2005), three studies used the TOSCA (Weingarden et al., 2016; Wetterneck et al., 2014) and one study used the SSGS (Hezel et al., 2012), all of which were used within the studies eligible for the meta-analysis. When the outcomes of the studies were compared based on the shame measure employed, there were no clear differences, making it difficult to draw any conclusions about the impact of the shame measure used on the relationships found between shame and OCD symptoms.

In terms of OCD measures, four studies used the Y-BOCS (Hezel et al., 2012; Kim et al., 2014; Kwak & Lee, 2015; Lochner et al., 2005), two studies used the OCI-R (Valentiner & Smith, 2008; Weingarden et al., 2016) and one study used the DOCs (Wetterneck et al., 2014). These measures were all used by studies eligible to be included in the meta-analysis. The main difference between OCD measures used in studies included in the meta-analysis and those not, was that two studies used the OCD symptom subscales in the results to look more closely at specific OCD symptoms rather than using the total score measuring OCD symptoms overall (Kim et al., 2014; Wetterneck et al., 2014). This resulted in not being able to determine the overall relationship between OCD and shame but instead the results showed specific symptom dimensions that were related to shame.

Despite employing different designs to investigate the variables of interest, the quality of the studies included within the meta-analysis and narrative synthesis were largely similar. The main methodological distinction was that most of the studies not eligible to be included in the meta-analysis included both clinical and non-clinical cases. Overall, the studies included in the narrative synthesis provide additional support for the hypothesis that shame is related to OCD symptoms. Mixed findings around whether shame is related to specific symptom dimensions of OCD were also highlighted.

Discussion

This is the first systematic review and meta-analysis examining associations between measures of shame and OCD. Overall, the findings indicate that there is a significant, moderate and positive correlation between shame and OCD symptoms. The meta-analysis findings were robust to secondary and sensitivity analyses. However, this needs to be interpreted with caution due to high levels of heterogeneity across studies. In total, nine studies found a significant moderate-to-large association between shame

and OCD symptoms and four found a significant small-moderate association. One study found a small, non-significant association. Additionally, five studies found that shame was significantly higher in OCD groups when compared to a control group. One study found shame was correlated with specific OCD symptom dimensions and one study found that shame moderated the relationship between obsessions and compulsions. Therefore, the majority of studies within this review supported a relationship between shame and OCD.

Subgroup analyses were conducted in order to explore heterogeneity within the meta-analysis and address secondary aims. Each subgroup showed a similar weighted effect size and tests of variance between subgroups were not significant, making it difficult to draw any conclusions about moderator variables. For each moderator analysis, the effect sizes within one subgroup was consistent and demonstrated low heterogeneity. It could be argued that if the current meta-analysis had more power, more consistency may have been found within subgroups and these variables may have explained some of the heterogeneity within the primary meta-analysis. Additionally, it could be argued that despite the heterogeneity between studies in the main meta-analysis, the similarities in weighted effect sizes between shame and OCD symptoms found across measures and sample types in secondary meta-analyses may provide support for a relationship between these variables.

How do the findings relate to the wider literature?

The current review extends preliminary findings from a conceptual review by Weingarden and Renshaw (2015) as it included thorough systematic literature searches and synthesised the data in a meta-analysis where possible. This resulted in the inclusion of more recent and higher quality studies. Despite having different inclusion and exclusion criteria, thus focussing on different literature sources, the findings in the

current review support the role of shame in OCD as highlighted within Weingarden and Renshaw's (2015) conceptual review.

The current review findings adds to the growing evidence base that suggests shame plays a role within mental health difficulties (Brown et al., 2009; Hayaki, Friedman & Brownell, 2002; Kim et al., 2011; Tangney et al., 1992). With this in mind, Candea and Szentagotai (2013) consider the different roles that shame may play within mental health difficulties and asserted that shame could be a predictor, a symptom and diagnostic component and as a mechanism of change that may be useful to target in therapy. It was beyond the scope of the current review to investigate cause and effect and the mechanisms through which shame impacts on OCD. The findings would support the utility of further research into this.

Consideration of findings from subgroup and moderator analyses

The current review highlighted potential variables that may impact on the relationship between shame and OCD (sample type, OCD measure used and shame measure used). Exploring these variables was included within the secondary aims of this meta-analysis. Despite none of these variables being found to explain the heterogeneity within the current meta-analysis, it may still be important to consider the impact of these and any differences within and between subgroups. For example, the finding that there was no heterogeneity within studies that used a non-clinical sample but high heterogeneity within studies that used a clinical sample may be useful to consider. One explanation for this is the clinical sample's may have had more variation in OCD symptoms than non-clinical samples. For example, one clinical sample was recruited from an acute care psychiatric inpatient facility (Averill et al., 2002) and another from websites related to OCD (Singh et al., 2016). Therefore, it is likely that although both these samples fit within a 'clinical' category that their symptom severity will be varied.

Another explanation for the consistency within the non- clinical sample could be that 5 out of the 9 studies that used a non-clinical sample were conducted by at least one of the same author's, which may have resulted in similar research designs and approaches, increasing homogeneity. Although caution needs to be taken when comparing the effect size's between studies that used a clinical sample and studies that used a non-clinical sample, it may be useful to note that both groups showed a moderate weighted effect size between OCD and shame. This lends support to findings by Abramowitz et al. (2014) who found that using non-clinical samples to investigate OCD symptoms is acceptable and relevant to clinical samples due to OCD symptoms being dimensional in nature and similar in terms of aetiology, phenomenology and maintenance factors. The main difference Abramowitz et al. (2014) highlighted between clinical and non-clinical groups was severity. This was also supported by studies within the narrative synthesis as most studies included both a clinical and non-clinical group and shame was found to be significantly higher within the clinical groups, suggesting a relationship between shame and more severe OCD symptoms.

Tangney & Dearing (2002) highlight challenges faced when operationalizing shame such as it being a secondary emotion and not having a clear or definable facial expression. This means that measures have had to rely on verbal reports of feelings of shame which can introduce difficulties such as the blurring of the distinction between the constructs of shame and guilt. The measures that have developed to measure shame are largely based on a definition of shame and generally seem to either measure state shame (feelings of shame within the moment) or trait shame (dispositional shame-proneness). When studies were grouped within the meta-analysis based on the type of shame measure used, the most consistent and homogenous findings were within the group of studies that used the TOSCA to measure shame. The TOSCA was the most frequently used measure of shame within the current review, which may have increased

power and impacted on the low heterogeneity found within this group compared to the other groups that measured shame. The TOSCA is a scenario-based measure that assesses shame-proneness in specific situations. Within all the studies included in the review, six different measures were used to measure shame. These measures all operationalized shame slightly differently which may have increased the heterogeneity within the primary analysis. For example, the other shame measures included in the subgroup meta-analysis included the YSQ which measures shame as a schema and the ESS which captures behavioural, characterological and bodily shame. It was difficult to explore differences in shame measures and whether different types of shame had different relationships with OCD due to most of the subgroups showing high heterogeneity and needing to be treated with caution. However, the effect sizes for each measure of shame were quite similar, which may indicate that the relationship between shame and OCD is consistent despite the type of shame measured. Additionally, within the narrative review different shame measures used did not seem to have a clear impact on the findings. It is important to note that the large range of shame measures meant that some measures were only used within one study, meaning these measures couldn't be grouped and included within subgroups.

Finally, due to seven different OCD measures being used within the studies in the review, it was, again, difficult to group studies based on OCD measures and assess the impact on the relationship between shame and OCD. An additional difficulty with OCD measures is the heterogeneity within measures explained by high comorbidity with other mental health diagnoses (Overduin & Furnham, 2012). This may explain the heterogeneity found within the OCD measures subgroups. The current meta-analysis found that the studies that used the SCl-90 OCD subscale to measure OCD were the most consistant and had no heterogeneity. However, one explanation for this

consistency could be that 5 out of the 6 studies that used the SCL-90 were conducted by at least one of the same author's.

Critique and areas for future research

In terms of strengths, the current review used best practice guidelines (CRD, 2008) to inform systematic and meta-analytic processes. This included thorough systematic searching of a range of databases, assessment of publication bias and ensuring that the quality of assessment of the studies was checked by an independent rater; all of which improved the quality of the current literature review and meta-analysis. The current review also contributes to the literature in this area by synthesising relevant research and thus providing more clarity about the strength and nature of the relationship between shame and OCD.

In terms of limitations, most of the studies included in the review could be considered poor in quality. This is mainly due to the correlational design of the majority of the studies and a number of items in the quality appraisal being not applicable to this design e.g. items around randomization and blinding procedures. Whilst correlational studies can be considered less scientifically rigorous than other methodologies, they are invaluable for investigating the relationship between two constructs and thus were highly relevant to answering the current research question. With the research question in mind it could be expected that most of these studies would be correlational in nature. The studies with higher quality scores used more of an experimental methodology and whilst the results were relevant to the research question, they were unable to be included in the meta-analysis due to not providing the relevant statistics. It is important to consider that the quality of the studies may have had an impact on the meta-analysis findings.

As the studies eligible to be included in the meta-analysis were correlational, no inferences can be made about cause and effect and the mechanisms through which shame is related to OCD symptoms. Further research needs to be completed in order to explore this within a review, ideally through prospective and experimental study designs. For example, investigating interventions that target shame in OCD may be useful. Additionally, in order to further understand the nature of the relationship between shame and OCD, it may be useful for future research to investigate the mechanisms by which shame impacts on OCD symptoms. For example, by researching whether shame is associated with specific symptom dimensions of OCD such as intrusive thoughts. The literature base in this area is relatively small and so additional research into the relationship between shame and OCD generally is warranted. Additional research would allow the current review to be updated with additional studies, adding power to the analyses.

All the studies eligible to be included within this review assessed both shame and symptoms of OCD using self-report questionnaires. It was part of the inclusion criteria of the current review that all of these measures are validated, improving the internal validity of these studies. However, it is important to acknowledge the limitations of using self-report measures such as social desirability biases.

The current review only including published studies may have introduced bias in that the risk of overestimating the effect size is higher (Boland, Cherry & Dickson, 2014). However, within the meta-analysis publication bias was assessed in order to try and account for this.

Some variability in effect sizes can expected within a meta-analysis using due to "ordinary sampling error" (Rosenthal, 1991, pg. 186; Field & Gillett, 2011; CRD, 2008). However, it is important to acknowledge the heterogeneity found that is not due to sampling error and the limitations of high levels of heterogeneity within a meta-

analysis in terms of the interpretation and generalization of the findings. The current review used the Q and I^2 statistic to assess homogeneity and found a significant level of heterogeneity within the primary analysis that could not be attributed to the sampling error. This was investigated further through subgroup and moderator analyses. Although some consistency and homogeneity was found within some subgroups, these variables were not found to explain the variability, therefore the findings of this meta-analysis should be interpreted with caution. It would be useful to repeat this meta-analysis once further research has been completed in order to explore this within a meta-analysis with higher power. It is possible that a moderator variable may have been found if further analyses were completed, for example by splitting the studies into further subgroups or conducting a meta-regression using continuous variables. However, no further moderator analyses were completed as it is recommended that this is only done for a limited number of a priori hypotheses (Lipsey & Wilson, 2001; CRD, 2008). This is due to the increased risk of finding a false positive or a false negative significance tests through conducting extensive exploratory analyses.

Clinical implications

Whilst acknowledging the limitations of the current review and that more research is needed to further our understanding of the relationship between shame and OCD, these outcomes may be useful to consider within clinical practice. For example, it may be useful for clinicians working with individuals with symptoms of OCD to explore feelings of shame within the assessment and where appropriate include this within the formulation or understanding of the persons difficulties. Additionally, this review has highlighted various measures of shame that operationalise shame differently. When assessing shame using validated measures in clinical practice, considering the type of shame (e.g. state shame or trait shame) may be important.

Shame is not currently acknowledged in relation to OCD within the DSM-5. It could be argued that the current review provides preliminary evidence that shame may be a useful factor to consider within formal classification of OCD. However, more research would need to be conducted to make this conclusion.

Conclusions

When considering all the studies within this systematic literature review and meta-analysis, a moderate, positive and significant relationship between shame and OCD symptoms in which high shame-proneness is related to high OCD-symptoms is supported. However, these findings should be interpreted within the context of acknowledging the high heterogeneity found and the poor quality of the studies included.

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Appendix A – Search Terms

(shame OR "shame-proneness")

OR

("Internalized shame scale" OR "Test of self-conscious affect" OR "Experience of shame scale" OR "other as shamer" OR "Self-conscious affect and attribution inventory" OR "Personal feelings questionnaire" OR "Dimensions of conscience questionnaire" OR "guilt and shame proneness scale" OR "Beall shame guilt test" OR "Adapted shame and guilt scales" OR "Measure of susceptibility to guilt and shame" OR "anxiety attitude survey")

AND

("Obsessive compulsive disorder" OR "Obsessive-compulsive disorder" OR OCD OR "obsessive compulsive" OR "obsessive-compulsive")

OR

("obsessive-compulsive inventory" OR "yale-brown obsessive compulsive scale" OR "dimensional obsessive-compulsive scale" OR "Padua inventory" OR "Vancouver obsessional compulsive inventory" OR "schedule of compulsions, obsessions and pathological impulses" OR "florida obsessive-compulsive inventory" OR "clark-beck obsessive-compulsive inventory")

Appendix B - Downs and Black Quality appraisal tool

Appendix

Checklist for measuring study quality

Reporting

1. *Is the hypothesis/aim/objective of the study clearly described?*

yes	1
no	0

2. *Are the main outcomes to be measured clearly described in the Introduction or Methods section?*
If the main outcomes are first mentioned in the Results section, the question should be answered no.

yes	1
no	0

3. *Are the characteristics of the patients included in the study clearly described ?*
In cohort studies and trials, inclusion and/or exclusion criteria should be given. In case-control studies, a case-definition and the source for controls should be given.

yes	1
no	0

4. *Are the interventions of interest clearly described?*
Treatments and placebo (where relevant) that are to be compared should be clearly described.

yes	1
no	0

5. *Are the distributions of principal confounders in each group of subjects to be compared clearly described?*
A list of principal confounders is provided.

yes	2
partially	1
no	0

6. *Are the main findings of the study clearly described?*
Simple outcome data (including denominators and numerators) should be reported for all major findings so that the reader can check the major analyses and conclusions. (This question does not cover statistical tests which are considered below).

yes	1
no	0

7. *Does the study provide estimates of the random variability in the data for the main outcomes?*
In non normally distributed data the inter-quartile range of results should be reported. In normally distributed data the standard error, standard deviation or confidence intervals should be reported. If the distribution of the data is not described, it must be assumed that the estimates used were appropriate and the question should be answered yes.

yes	1
no	0

8. *Have all important adverse events that may be a consequence of the intervention been reported?*
This should be answered yes if the study demonstrates that there was a comprehensive attempt to measure adverse events. (A list of possible adverse events is provided).

yes	1
no	0

9. *Have the characteristics of patients lost to follow-up been described?*
This should be answered yes where there were no losses to follow-up or where losses to follow-up were so small that findings would be unaffected by their inclusion. This should be answered no where a study does not report the number of patients lost to follow-up.

yes	1
no	0

10. *Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?*

yes	1
no	0

External validity

All the following criteria attempt to address the representativeness of the findings of the study and whether they may be generalised to the population from which the study subjects were derived.

11. *Were the subjects asked to participate in the study representative of the entire population from which they were recruited?*
The study must identify the source population for patients and describe how the patients were selected. Patients would be representative if they comprised the entire source population, an unselected sample of consecutive patients, or a random sample. Random sampling is only feasible where a list of all members of the relevant

population exists. Where a study does not report the proportion of the source population from which the patients are derived, the question should be answered as unable to determine.

yes	1
no	0
unable to determine	0

12. *Were those subjects who were prepared to participate representative of the entire population from which they were recruited?*
The proportion of those asked who agreed should be stated. Validation that the sample was representative would include demonstrating that the distribution of the main confounding factors was the same in the study sample and the source population.

yes	1
no	0
unable to determine	0

13. *Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive?*
For the question to be answered yes the study should demonstrate that the intervention was representative of that in use in the source population. The question should be answered no if, for example, the intervention was undertaken in a specialist centre unrepresentative of the hospitals most of the source population would attend.

yes	1
no	0
unable to determine	0

Internal validity - bias

14. *Was an attempt made to blind study subjects to the intervention they have received ?*
For studies where the patients would have no way of knowing which intervention they received, this should be answered yes.

yes	1
no	0
unable to determine	0

15. *Was an attempt made to blind those measuring the main outcomes of the intervention?*

yes	1
no	0
unable to determine	0

16. *If any of the results of the study were based on "data dredging", was this made clear?*
Any analyses that had not been planned at the outset of the study should be clearly indicated. If no retrospective unplanned subgroup analyses were reported, then answer yes.

yes	1
no	0
unable to determine	0

17. *In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls ?*
Where follow-up was the same for all study patients the answer should yes. If different lengths of follow-up were adjusted for by, for example, survival analysis the answer should be yes. Studies where differences in follow-up are ignored should be answered no.

yes	1
no	0
unable to determine	0

18. *Were the statistical tests used to assess the main outcomes appropriate?*
The statistical techniques used must be appropriate to the data. For example non-parametric methods should be used for small sample sizes. Where little statistical analysis has been undertaken but where there is no evidence of bias, the question should be answered yes. If the distribution of the data (normal or not) is not described it must be assumed that the estimates used were appropriate and the question should be answered yes.

yes	1
no	0
unable to determine	0

19. *Was compliance with the intervention/s reliable?*
Where there was non compliance with the allocated treatment or where there was contamination of one group, the question should be answered no. For studies where the effect of any misclassification was likely to bias any association to the null, the question should be answered yes.

yes	1
no	0
unable to determine	0

20. *Were the main outcome measures used accurate (valid and reliable)?*

For studies where the outcome measures are clearly described, the question should be answered yes. For studies which refer to other work or that demonstrates the outcome measures are accurate, the question should be answered as yes.

yes	1
no	0
unable to determine	0

Internal validity - confounding (selection bias)

21. *Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population?*
For example, patients for all comparison groups should be selected from the same hospital. The question should be answered unable to determine for cohort and case-control studies where there is no information concerning the source of patients included in the study.

yes	1
no	0
unable to determine	0

22. *Were study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time?*
For a study which does not specify the time period over which patients were recruited, the question should be answered as unable to determine.

yes	1
no	0
unable to determine	0

23. *Were study subjects randomised to intervention groups?*
Studies which state that subjects wererandomised should be answered yes except where method of randomisation would not ensure random allocation. For example alternate allocation would score no because it is predictable.

yes	1
no	0
unable to determine	0

24. *Was the randomised intervention assignment concealed from both patients and health care staff until recruitment was complete and irrevocable?*
All non-randomised studies should be answered no. If assignment was concealed from patients but not from staff, it should be answered no.

yes	1
no	0
unable to determine	0

25. *Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?*
This question should be answered no for trials if: the main conclusions of the study were based on analyses of treatment rather than intention to treat; the distribution of known confounders in the different treatment groups was not described; or the distribution of known confounders differed between the treatment groups but was not taken into account in the analyses. In non-randomised studies if the effect of the main confounders was not investigated or confounding was demonstrated but no adjustment was made in the final analyses the question should be answered as no.

yes	1
no	0
unable to determine	0

26. *Were losses of patients to follow-up taken into account?*
If the numbers of patients lost to follow-up are not reported, the question should be answered as unable to determine. If the proportion lost to follow-up was too small to affect the main findings, the question should be answered yes.

yes	1
no	0
unable to determine	0

Power

27. *Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%?*
Sample sizes have been calculated to detect a difference of x% and y%.

	Size of *smallest* intervention group	
A	$<n_1$	0
B	n_1–n_2	1
C	n_3–n_4	2
D	n_5–n_6	3
E	n_7–n_8	4
F	n_9+	5

Note: The scoring guidance suggested by O'Conner et al. (2015) were used to score the final question relating to power.

Appendix C- Reasons for excluding abstracts

Reasons for excluding abstracts that were screened (167)

Didn't include appropriate measures: 99

Qualitative: 7

Not in English: 8

Single case/case study: 19

Children sample: 10

Book chapter: 11

Reviews: 13

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Appendix E - Meta-analysis including transformed effect sizes

Table 1.

Additional effect sizes

Study	Effect size (*r*)*
Kim, Lee & Lee (2014)	.66
Kwak & Lee (2015)	.7
Weingarden, Renshaw, Tangney & Willhelm (2016)	.55
Hezel, Rieman & Mcnally (2012)	.75

Note. *calculated based on one continuous variable (shame score) and one dichotomous variable (OCD group or Healthy control group)

Effect size and sampling variance

```
 FZ = Fisher's Z
 SV = Sampling variance [sqrt(SV) = Std err]

——
                                        Study    N     r   Moderator    FZ
1                                 Block (2016)   59 0.579 correlation 0.661
2                           Fergus et al. (2010)  124 0.270 correlation 0.277
3                         Haaland et al. (2011)   88 0.070 correlation 0.070
4                           Singh et al. (2016)  152 0.200 correlation 0.203
5                         Yoosefi et al. (2016)   50 0.540 correlation 0.604
6                         Averill et al. (2002)   82 0.425 correlation 0.454
7                          Shariatzadeh (2017)   52 0.655 correlation 0.784
8                        Alexias & Togos (2016) 2313 0.415 correlation 0.442
9                     Fergus & Valentiner (2012)   92 0.270 correlation 0.277
10                      Olatunji & Cox (2015)  403 0.340 correlation 0.354
11                Weingarden & Renshaw (2014)  263 0.340 correlation 0.354
12           Tangney, Wagner & Gramzow 1 (1992)  245 0.310 correlation 0.321
13            Tangney Wagner & Gramzow 2 (1992)  234 0.380 correlation 0.400
14                  Tangney & Dearing 1 (2002)  254 0.310 correlation 0.321
15                  Tangney & Dearing 2 (2002)  158 0.400 correlation 0.424
16                  Tangney & Dearing 3 (2002)  252 0.340 correlation 0.354
17                    Weingarden et al. (2016)   93 0.220 correlation 0.224
18               Hezel, Rieman & McNally (2012)   45 0.750 transformed 0.973
19                           Kwak & Lee (2015)  121 0.700 transformed 0.867
20 Weingarden, Renshaw, Tangney & Wilhelm (2016)  204 0.550 transformed 0.618
21                         Kim, Lee & Lee (2014)  127 0.660 transformed 0.793
      SV
1  0.018
2  0.008
3  0.012
4  0.007
5  0.021
6  0.013
7  0.020
8  0.000
9  0.011
10 0.002
11 0.004
12 0.004
13 0.004
14 0.004
15 0.006
16 0.004
17 0.011
18 0.024
19 0.008
20 0.005
21 0.008
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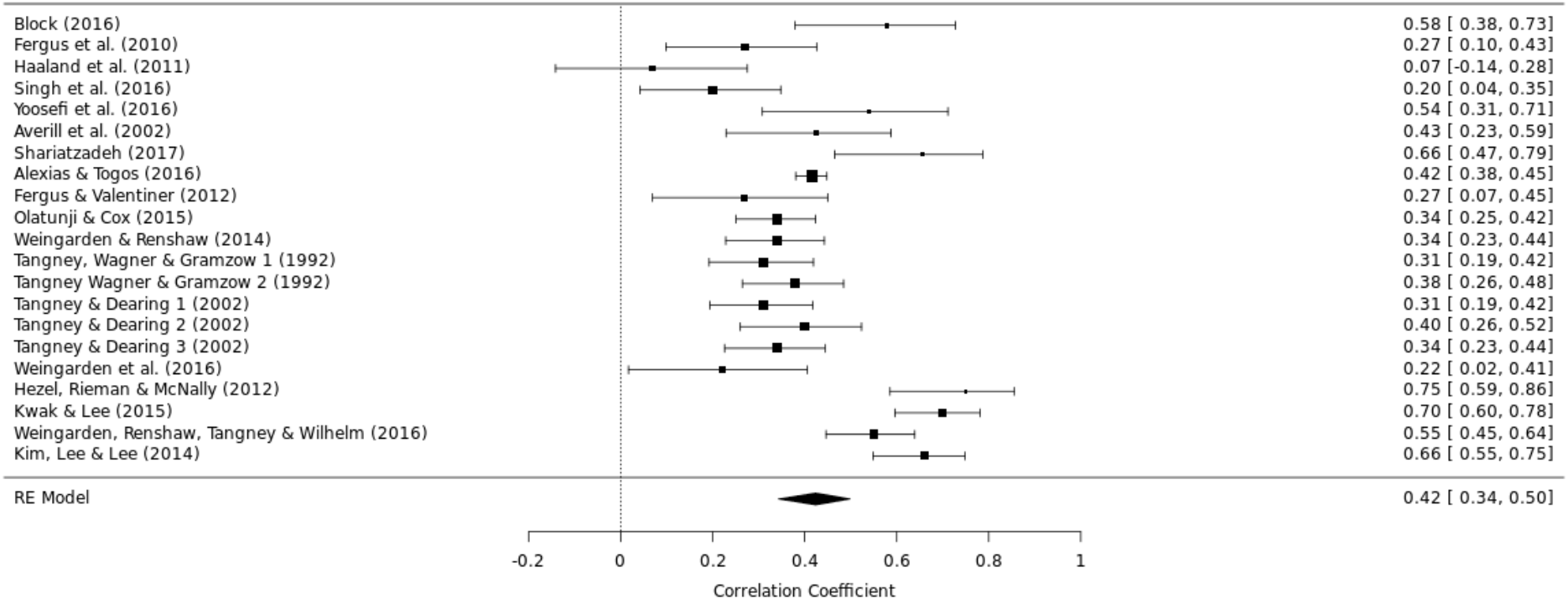

Figure E1. Meta-analysis including transformed variables forest plot

Part 2: Research Report

The Relationship Between Shame-proneness and Experiences of Obsessive Intrusive Thoughts in a Non-Clinical Sample.

A Quantitative Study.

Abstract

Objective: Emerging research indicates a relationship between shame and obsessive-compulsive disorder (OCD). However, little is known about the relationship between shame-proneness and more specific symptoms of OCD, such as obsessive intrusive thoughts (OITs). This study aimed to investigate the relationship between shame-proneness and experiences of OITs, including distress related to OITs, inferences about the self related to OITs and frequency of OITs. A secondary aim of the study was to investigate the relationship between shame-proneness and the estimation of the prevalence of OITs in others.

Design and Method: In a cross-sectional design, a non-clinical sample of participants (n = 299) completed questionnaire measures of shame-proneness and experiences of OITs (including frequency, related distress and inferences about the self). A series of multiple hierarchical regression analyses were conducted to assess the predictive power of shame-proneness after controlling for OCD symptoms.

Results: Consistent with predictions, shame-proneness significantly predicted all OIT measures, over and above OCD symptoms. However, OCD symptoms were the strongest predictor of OIT frequency, not shame-proneness as predicted. Contrary to predictions, respondents with higher shame-proneness reported higher estimations of OIT prevalence compared to those with low shame-proneness, however this result should be interpreted with caution due to the use of an unvalidated measure.

Conclusion: These findings extend previous research on shame-proneness and OCD, by specifying a relationship between OITs, a specific symptom dimension of OCD and shame-proneness. These results further our understanding about OCD and related constructs.

Practitioner points:

- The findings suggest that assessing shame-proneness should be considered within assessment and prevention when working with individuals experiencing OITs.
- The relationship between shame-proneness and appraisals of OITs could be a useful addition to cognitive models of OITs.
- The cross-sectional design of this study precludes conclusions regarding causality in the relationship between shame and OITs.
- Results from this non-clinical sample require replication and extension to a clinical sample.

Introduction

Obsessive intrusive thoughts (OITs) are a symptom of obsessive compulsive disorder (OCD; Diagnostic and Statistical Manual of Mental Disorders 5th edition; DSM-5; American Psychiatric Association, 2013), and are commonly described as cognitions that are involuntary, disruptive, repetitive, unwanted and difficult to control (Rachman, 1981). OITs are not unique to clinical populations but also a common experience in the general population and are not necessarily problematic (Belloch, Morillo, Lucero, Cabedo, & Carrio, 2004; Radomsky et al., 2014). In a pioneering study, Rachman and de Silva (1978) investigated OITs experienced by clinical and non-clinical samples and reported similarities in both content and form of the cognition (e.g. verbal thoughts, impulses and imagery). However, OITs in the clinical sample were reported as more frequent, more intense, lasted longer, and caused individuals' more discomfort. These findings have since been replicated in multiple and recent studies, as well as across cultures (e.g. Garcia-Soriano, Belloch, Morillo & Clark, 2014; Purdon & Clark, 1993; Radomsky et al., 2014). Previous literature reviews of research relating to OITs have concluded that OITs can be understood as dimensional in nature and experienced on a continuum from benign experiences of OITs to clinical and distressing experiences of OITs (Abramowitz et al., 2014; Berry & Laskey, 2012). Differences are noted in the endorsement rates of types of OITs and the associated distress; with clinical samples reporting more experiences of and greater distress related to contamination and disease and generally more bizarre and aggressive OITs than non-clinical samples (Berry & Laskey, 2012; Garcia-Soriano et al., 2011).

Cognitive models of OCD provide an explanation for differences in the experience of OITs between clinical and nonclinical populations, suggesting the appraisal of OITs plays a key role in how 'normal' OITs become problematic (Belloch et al., 2004; Purdon & Clark, 1993; Rowa & Purdon, 2003; Salkovskis et al., 2000). For

example, Salkovskis et al. (2000) suggest that misinterpretations of the significance or responsibility related to OITs can lead to distress. Previous research supports this supposition and demonstrates that catastrophic appraisals of OITs lead to an increase in both the frequency of OITs and associated distress (Berry & Laskey, 2012; Garcia-Soriano et al., 2014). Additionally, Rachman's (1997) cognitive model outlines various vulnerability factors (including anxiety proneness, elevated moral standards and depression) that impact on the negative experience of OITs.

Shame can be defined as a self-conscious, painful emotion that is felt when a person judges themselves negatively (Tangney & Dearing, 2002). As a 'social emotion', shame is felt when an individual's 'social self' is under threat (Kim, Jorgensen & Thibodeau, 2011). There is growing evidence for a relationship between shame and psychopathology, including depression, anxiety, paranoia and psychotic symptoms (Kim et al., 2011; Tangney, Wagner, & Gramzow, 1992). In a recent conceptual review of the literature, Weingarden and Renshaw (2015) asserted that shame is closely associated with obsessive-compulsive related disorders (OCRDs). For example, Tangney, Wagner, and Gramzow, (1992) reported a significant positive correlation between shame-proneness and the obsessive-compulsive subscale of the symptom checklist (SCL-90). More recent studies have also shown that levels of shame are higher in groups of individuals with OCD when compared to non-clinical control groups (Hezel, Riemann & McNally, 2012; Kim et al., 2014).

Previous research has considered the relationship between specific subtypes of obsessive-compulsive difficulties and shame. For example, Simonds and Thorpe (2003) investigated attitudes towards OCD by providing a student sample with vignettes illustrating three subtypes of obsessive-compulsive difficulties: obsessions around washing, checking and harming self and others. Participants were asked to make judgements about shame, fear and social acceptance for each vignette. It was found that

shame and fear evaluations were greatest for the vignette around harming. The authors concluded that attitudes differ depending on the subtypes of OCD symptoms. Similarly, Wetterneck, Singh and Hart, (2014) investigated the relationship between shame proneness and OCD symptom dimensions (measured by the Dimensional Obsessive-Compulsive Scale) in an OCD sample and observed a positive correlation between high levels of shame and high levels of obsessions and compulsions related to harm and symmetry. These two studies suggest the relationship between shame and OCD may vary according to specific symptom dimensions. However, there is a lack of research investigating the individual experience of shame in relation to OITs specifically as a targeted symptom dimension of OCD.

Rachman (2003) indicated that a typical appraisal of OITs is that there is something bad or wrong with the individual. Therefore, individuals who are prone to feelings of shame may be more likely to appraise OITs negatively and experience more distress related to the OIT. Rachman (1997) asserts that in clinical populations, OITs are often interpreted as exposing hidden parts of the individual's identity. In support of this idea, Weingarden and Renshaw (2015) define OCD symptom- based shame as "felt in response to obsessions and interpretations of what an obsession means about oneself" (pg. 5). In line with this supposition, Ferrier and Brewin (2005) predicted that individuals with a diagnosis of OCD would be more likely to appraise their intrusions as being indicative of more negative self-characteristics when compared with individuals with anxiety symptoms and a non-clinical sample. Subsequently, Ferrier and Brewin (2005) developed the intrusion related self-inference scale (IRSIS) to investigate the relationship between OCD symptoms and the "extent to which intrusions lead to negative inferences about the self" (pg. 1368; Ferrier & Brewin, 2005). As predicted, participants in the OCD group made significantly more negative inferences about themselves related to their OITs than participants in the anxious and non-anxious

control groups. Therefore, shame may play a role in the interpretation or appraisal of OITs, specifically the sense individuals make of their OITs in relation to the self.

Tangney and Dearing (2002) also asserted that feelings of shame can prompt avoidance and withdrawal behaviours. Marques et al. (2010) reported that 58.2% of participants with OCD symptoms specified that a barrier to accessing treatment was feeling ashamed of needing help. Alongside this, OCD symptoms have also been found to be related to withdrawal, for example a correlational study found that individuals with higher levels of OCD symptoms were less likely to self-disclose to their partners (Abbey, Clopton & Humphreys, 2007). Concealing the content and frequency of OITs is a common safety behavior in OCD (Newth & Rachman, 2001). Shame in OCD may therefore contribute to maintenance factors of the disorder. For example, people experiencing high levels of shame- proneness may withdraw and conceal their OITs from others, reducing the opportunity for discovering corrective information regarding their pervasive nature, and thus for negative appraisals of OITs to be adjusted.

Normalization and psychoeducation techniques (Salkovskis, 1999) are often utilized in cognitive behaviour therapy (CBT) for OCD in order to target appraisals of OITs. These techniques include providing the individual with information about the nature of the difficulties they are experiencing. Psychoeducation aims to increase the individual's knowledge and understanding about their difficulties, dispelling any misconceptions and providing the beginnings of ideas around coping skills, and commonly include sharing information about common early warning signs, general awareness of the diagnosis or information about treatment options (Rees, Austen, Anderson & Egan, 2014). Research has demonstrated the positive effects of normalization and psychoeducation about OITs. For example, Rees et al., (2014) report that nonclinical participants who received psychoeducation and normalization information about OITs reported a reduction in maladaptive appraisals related to OITs.

According to the cognitive model, psychoeducation and normalization interventions are effective because they allow the individual to adjust their appraisals of OITs (Salkovskis, 1999). These techniques are based on the assumption that the individuals who are distressed by OITs do not have an accurate idea of the prevalence of OITs. However, this assumption has not yet been tested. It is possible that individuals with greater shame-proneness hold misconceptions about the prevalence of OITs, perhaps believing they are uncommon and subsequently bad and shameful thoughts to have.

The current study

Previous literature suggests that shame may play a part in the development of OCD; however, we do not yet know the mechanism by which this might occur. There has been little research into how shame-proneness impacts on people's experiences of OITs specifically; such frequency of OITs, related distress and inferences about the self related to OITs. Finally, whilst it is possible that individuals with high levels of shame are less likely to access corrective information about OITs, it is not known whether there is a relationship between shame and peoples understanding of the prevalence of OITs.

Aims and hypotheses

Primary aim

To investigate the relationship between shame proneness and experiences of OITs (including frequency, emotional reaction and inferences about the self).

Primary hypotheses

a. Shame-proneness will predict the frequency of OITS over and above OCD symptoms, such that as shame proneness increases the frequency of OITs increases.

b. Shame-proneness will predict distress in relation to OITs over and above OCD symptoms, such that as shame proneness increases, distress increases.

c. Shame-proneness will predict negative inferences about the self related to OITs over and above OCD symptoms such that as shame proneness increases, negative inferences about the self-increase.

Secondary aim

To investigate the relationship between shame-proneness and the estimation of the prevalence of OITs in others.

Secondary hypothesis

Shame-proneness will be associated with estimation of prevalence of OITs, such that as shame proneness increases, under-estimation of OITs in others increases.

Method

Design

A quantitative cross-sectional design was employed. Participants completed an online survey, consisting of a battery of self-report questionnaires, hosted via Qualtrics (https://www.qualtrics.com). The online survey was piloted by trainee psychology peers prior to recruitment in order to calculate the average completion time and highlight any problems with the survey so they could be rectified prior to data collection.

The study was advertised for recruitment via the University of Sheffield staff and student volunteers email list, the psychology undergraduate student credit system

and on social media (Twitter and Facebook; Appendix A). The online survey included information about the study (Appendix B), a consent form (Appendix C) and debrief at the end (Appendix D). All participants completed the same online survey with questionnaires appearing in a fixed order.

Participants

Participants had to be 18+ years old to participate. Individuals with a diagnosis of OCD were not eligible to take part in the study. Individuals who indicated they had a diagnosis of OCD (n = 7) within screening questions were directed to the end of the survey to a screen which informed them that they were not eligible to participate and thanked them for their interest in the research.

As a 'thank you' for taking part, participants were given the opportunity to be entered into a prize draw with the chance to win one of two £25 amazon vouchers. Prize draw winners were randomly selected using a random number generator and were notified by e-mail. Participants who were recruited via the psychology undergraduate credit system received credits in exchange for their participation and were not eligible to be entered into the prize draw.

Procedure

The recruitment advertisements included a hyperlink which directed individuals to the information sheet and consent form hosted on Qualtrics. Individuals who met inclusion criteria were able to provide consent to participate by checking a box to either agree to take part or not. Participants were then directed to complete the online survey; demographic questions were completed before the battery of self-report outcome measures. At the end of the survey participants were directed to a debrief page, which provided information about the aims of the study, the answer to the prevalence of OITs

question and information about support services. The survey opened on 6th April 2017 and closed on 27th April 2017.

Ethical considerations

Ethical approval for this study was obtained from the University of Sheffield, Department of Psychology Ethics Committee (Appendix E). Some of the self-report questionnaires could have potentially caused participants distress, as they ask about feelings of distress, OITs, shame and OCD-symptoms, which some people might find difficult to read, think about or answer. The debrief page at the end of the questionnaire provided charity and help line contact numbers so that participants could access support if necessary. This page also provided advice to contact their doctor for further support and information.

Outcome measures

Participants were asked to provide demographic information including student status, age, gender, ethnicity and the country they were residing in. Participants then completed a battery of measures in a fixed order (as presented below) to ensure the order of measures didn't inadvertently impact on participants' answers.

Estimation of the prevalence of OITs (Appendix F)

A definition of OITs was provided, which was drawn from the Obsessive Intrusive Thoughts Inventory (INPIOS; original version in Spanish: "Inventario de pensamientos intrusos obsesivos", Garcia-Soriano, 2008). Participants were then informed about a study in which 777 students from 13 different countries were asked about their experiences of OITs (Radomsky et al., 2014). Participants were asked to estimate what percentage of the people in the study had said that they experienced at least one OIT in the last 3 months. Participants were encouraged to guess if they were

unsure.

An ‘estimation of prevalence of OITs’ score was calculated by subtracting the participant answer from the correct answer (93.6%). Therefore, the measure is centered at zero, with higher scores indicating underestimation and negative scores indicating overestimation. Scores closer to zero indicated more accuracy. As there is no previous research related to the estimation of OIT prevalence, this question was developed for use within this study to provide an estimation of the degree to which participants underestimate OITs.

Internalized Shame Scale (ISS; Cook, 1993; Appendix G). The ISS is a 30-item self-report questionnaire designed to measure internalized shame or ‘trait shame proneness’. Participants rated how often they think or experience each of the 24 negatively worded, global self-evaluation items (e.g. ‘I feel like I’m never quite good enough’) on a 5-point Likert scale (0 = seldom, 4 = almost always). The ISS also includes six positively worded items that measure self-esteem (in order to reduce the likelihood for a response set to develop), which were not used for the purposes of this study. The total shame score is calculated by adding the 24 negatively worded, global self-evaluation item responses, and can range from 0 to 96. Higher total scores indicate higher levels of shame-proneness. The ISS has demonstrated good psychometric properties in both clinical and nonclinical samples: internal consistency, alpha coefficients between .95 and .96 (Rosario & White, 2006); test-retest reliability, $r = .84$ over a 7-week period (Cook, 1993, 2001), and $r = .81$ over a 14- week period (Rosario & White, 2006). In the current sample $\alpha = .89$.

The Obsessive Intrusive Thoughts Inventory – Part 1 (INPIOS; original version in Spanish: “Inventario de pensamientos intrusos obsesivos”, Garcia-Soriano, 2008; Appendix H) is a self-report measure that assesses the frequency of OITs. Participants rated the frequency with which they have experienced each of 48 listed

OITs on a 7-point Likert scale (0 = "I have never had this intrusion, 6 = "I have this intrusion frequently during the day"). Participants were also given the option to record up to two idiosyncratic OITs that they have experienced. Total average frequency scores are calculated by summing all items rated as 1 and above and dividing this by the total number of items scored as 1 and above. Scores range from 0 to 6; higher scores represent greater average frequency of OITs. The INPIOS demonstrated high levels of internal validity in OCD samples (α = .91) and community samples (α = .94), good test-retest reliability (r = .97 over 7-14 days) and adequate convergent validity (Garcia-Soriano, Belloch, Morillo, & Clark, 2011). Additionally, social desirability was shown not impact on responses to the questionnaire, strengthening the internal validity of this measure. In the current sample α = .94.

Emotional and Behavioral Reaction to intrusive thoughts questionnaire EBRIQ; Berry, May, Andrade & Kavanagh, 2010; Appendix I*)* is a self-report questionnaire with two subscales measuring emotional and behavioral reactions to intrusive thoughts. The emotional subscale was used in this study to measure distress related to OITs. Participants rated how often four statements apply when they have an intrusive thought (e.g. 'It makes me feel miserable', 'It makes me feel I am losing control of my thoughts', 'It makes me anxious' and 'It makes me irritable') on a 5-point Likert scale (0 = never, 5 = every time). The total score was calculated by summing the score for each item. Total scores can range between 0 and 20; higher scores indicate more distress. The EBRIQ has good test-retest reliability (r = .68) over 30-70 days and convergent validity (Berry et al., 2010). In the current sample α = .82.

Intrusion – related self inference scale *(*IRSIS; Ferrier & Brewin, 2005; Appendix J) is a 12-item self-report measure of the extent to which intrusive thoughts lead to negative inferences about the self. Participants rated their agreement to each statement (e.g. "Some of my intrusive thoughts make me think that deep down I am a

bad person" and "Some of my intrusive thoughts make me feel that if other people really knew me they would reject me") on a 5-point Likert scale (0 = "not at all", 4 = "very much"). Total scores were calculated by summing item scores. Participant scores could range between 0 and 48; higher scores indicate high levels of negative inference about the self related to intrusions. Ferrier and Brewin (2005) reported that this scale has high internal validity (α = .95) and moderate test re-test reliability (r = 0.60 over 3 months). In the current sample α = .95.

The Obsessive Compulsive Inventory – revised (OCI-R; Foa et al., 2002; Appendix K) is an 18 item self-report questionnaire that assesses symptoms of OCD. Participants rated how much distress symptoms of OCD (e.g. I have saved up so many things that they get in the way') have caused them over the last month on a 5-point Likert scale (0 = "not at all', 4 = "extremely"). The total score was calculated by summing the scores for each item and could range between 0-72. Higher total scores indicate higher OCD symptom severity. Scores above 21 are taken to indicate clinical levels of OCD symptoms (Foa et al. 2002). Foa et al. (2002) reported that the OCI- R shows high consistency (α = .90) and high test-retest reliability (r = .74 to .91 over two weeks). In the current sample α = .90.

Statistical analysis

Data were exported from Qualtrics to SPSS (version 23). The normality of the data was assessed by inspection of skewness and kurtosis values. A histogram and Q-Q plot were generated and visually inspected to assess normality. Descriptive statistics (means and standard deviations) for each of the outcome measures were calculated. Preliminary correlation analyses were conducted to start to investigate the relationships between all variables. Correlation coefficients were interpreted in line with Cohen's (1988) guidelines (>.50 = large; .30 - .49 = moderate; .10 - .29 = small).

Primary hypotheses were tested by multiple hierarchical regression analyses. Preliminary analyses were conducted on the regression output to ensure the assumptions were met. Correlation coefficients between predictor variables were inspected to assess multi-collinearity. Visual analysis of P-P plots and histograms were used to assess the normality of residuals. The residuals were also assessed for homoscedasticity and linearity through visual analysis of the scatterplot. The Durbin-Watson statistic was used to assess autocorrelation of errors; Durbin-Watson statistics that are less than 1 or greater than 3 can generally be considered a cause for concern. Outliers were checked by inspecting the Mahalnobis and Cook's distances produced by the regression analysis. The multiple hierarchical regression analyses tested whether shame- proneness (independent variable; IV) predicted frequency of OITs, distress related to OITs and inferences about the self-related to OITs (dependent variables; DV). OCD symptoms were entered into the analysis in a step before shame-proneness in order to investigate the predictive power of shame-proneness over and above OCD symptoms. Prior to running the multiple hierarchical regressions, stepwise backwards regression analyses were conducted for each hypothesis to support exploratory model building by eliminating demographic variables that did not provide additional prediction to the IV and control variables included in the hypotheses (Field, 2013). Demographic variables (age, student status, gender, ethnicity and country residing in) were entered into the backwards-stepwise model alongside the main control variable (OCD symptoms) and predictor variable of interest (shame-proneness). Demographic variables that significantly predicted the DV were entered at step one into the final hierarchical regression models. The predictor variables (OCD symptoms and Shame-proneness) were entered at step 2 and 3 respectively based on previous literature and the aims of the study.

Power analysis

An a-priori power calculation using Cohen's (1992) tables indicated that 91 participants would be required to have 80% power for detecting a medium effect size in a multiple regression with five predictor variables, when applying .05 criterion of statistical significance.

Results

Sample characteristics

Data from all participants who provided informed consent (n = 380) were screened. Incomplete cases were eliminated as withdrawing from the survey invalidated consent (n = 81). The final sample of 299 participants had a mean age of 26.94 years (SD = 9.77), ranging from 18 years to 62 years. Table 1 displays further demographic information. The majority of the sample was female (71%), and students (70%). Due to most of the sample identifying themselves as 'white' (84%) and residing in the UK (93%), the categories with few responses were collapsed into one for the statistical analyses and labelled 'other' and 'non UK' respectively.

Table 1

Sample characteristics

		Frequency	%
Gender	Male	81	27.1
	Female	213	71.2
	Other	4	1.3
	Prefer not to say	1	.3
Ethnicity	White	250	83.6
	Asian	34	11.2
	Black African American	6	1.9
	Latin American	1	.3
	Mixed European	1	.3
	Arab	1	.3

	Kurdish	1	.3
	Mixed ethnicity	4	1.3
	Half European, half Asian	1	.3
Student status	Student	208	69.6
	Non-student	91	30.4
Country currently residing in	UK	278	93
	USA	1	.3
	Greece	2	.7
	Hong Kong	3	1
	Ireland	1	.3
	Switzerland	1	.3
	Malta	1	.3
	Australia	1	.3
	Brazil	1	.3
	United Arab Emarites	1	.3
	Turkey	1	.3
	Jordan	1	.3
	India	2	.7
	Syrian Arab Republic	1	.3
	Czech Republic	1	.3
	Indonesia	1	.3
	China	1	.3
	Portugal	1	.3

Data screening

Table 2 reports the statistical results for tests of normality and distribution of the data. For all variables, the Kolmogorov- Smirnov test was significant ($p < .05$), which suggested that the data were not normally distributed. However, non-normality is common in larger samples (Pallant, 2013). For the purposes of regression analyses, there is no need to assess the individual variables for normality if the distribution of the

residuals is normal (Tabachnick & Fidell, 2013). Therefore, the normality of residuals was assessed within the regression models.

Table 2

Assessing variables for normality

	Kolmogorov-Smirnov	Skewness	Kurtosis
Distress related to OITs (EBRIQ)	.09**	.17	-.75
Inferences about the self related to OITs (IRSIS)	.14**	.85	-.11
Frequency of OITs (INPIOS)	.08**	.67	.91
Estimation of prevalence	.12**	.75	-.15

Note. *$p < .05$ ** $p < .001$

Visual inspection of boxplots and scatterplots indicated nine outliers across the dataset. All identified outliers were checked for errors and all scores were deemed genuine. As the scores were unlikely to be errors, they were retained within the dataset for inclusion in subsequent analyses. The trimmed mean for each variable was compared to the mean value and all were similar values, indicating that the outliers in this dataset were not problematic (Pallant, 2013).

Descriptive and preliminary analyses

Mean scores and standard deviations for each outcome measure are presented in Table 3. The mean score on the OCI-R for the sample fell below the clinical cut off of 21; 217 participants (73%) scored below the clinical range of OCD and 82 participants (27%) scored within clinical range.

Table 3

Descriptive Statistics

	Mean	SD
EBRIQ	6.94	3.99
OCI-R	15.43	11.77
ISS	40.95	19.03
IRSIS	14.84	11.67
INPIOS	2.32	0.78
Estimation of prevalence	26.96	23.44

Note. EBRIQ = Emotional and Behavioural Reaction to Intrusions Questionnaire; OCI-R = Obsessive Compulsive Inventory Revised; ISS = Internalized Shame Scale; IRSIS = Intrusion Related Self Inference Scale; INPIOS = The Obsessive Intrusive Thoughts Inventory.

Correlation analyses

Table 4 presents the Spearman's Rho Correlation Coefficient between each of the main variables. Spearman's Rho was used as it is a more robust test for data that isn't normally distributed. The hypothesized relationships between shame-proneness and experiences of OITs were supported by medium-large positive correlations between the relevant measures: As levels of reported shame-proneness (ISS) increased, so did reported frequency of OITs (INPIOS), distress associated with OITs (EBRIQ) and negative inferences about the self-related to OITS (IRSIS).

Secondary hypothesis

Contrary to the hypothesized relationship, there was a small negative correlation between shame-proneness (ISS) and estimation of prevalence of OITs. This suggests that respondents with higher shame-proneness tended to have higher estimations of OIT prevalence by comparison to those with low shame-proneness.

Table 4

Spearman's Rho Correlation Coefficients between main variables

	ISS	OCI-R	EBRIQ	IRSIS	INPIOS
ISS	_				
OCI-R	.47**	_			
EBRIQ	.63**	.54**	_		
IRSIS	.68**	.54**	.6**	_	
INPIOS	.45**	.51**	.46**	.44**	_
Estimation of prevalence	-.21**	-.15*	-.13*	-.19*	-.25**

Note. * $p < 0.05$, ** $p < 0.01$; $n = 299$; ISS = Internalized Shame Scale; OCI-R = Obsessive Compulsive Inventory Revised; EBRIQ = Emotional and Behavioural Reaction to Intrusions Questionnaire; IRSIS = Intrusion Related Self Inference Scale; INPIOS = The Obsessive Intrusive Thoughts Inventory.

Multiple hierarchical regression analyses

Assumptions

Preliminary analyses conducted on the regression output indicated that the assumption of multicollinearity was met in all regression analyses (correlation coefficients between predictor variables were less than .7; the variance inflation factor was less than 10; the tolerance statistic was above .10). Visual analysis of the histograms and P-P plots of the residuals showed that the residuals were normally distributed for each regression analysis. The Durbin- Watson statistic fell between 1 and 3 for each regression analysis, suggesting the assumption of independent errors was met. When assessing outliers, each regression analyses had 1 or 2 cases in which Mahalnobis distances exceeded the critical values. However, this is to be expected given the large sample size (Pallant, 2013). Additionally, all Cook's distances were less than 1, suggesting that none of these cases were problematic to the interpretation of the results (Tabachnick and Fidell, 2013). Casewise diagnostics for each regression and identified cases in which the standardized residuals fell below -2 or greater than 2. In a sample of 299, 5% of these

(15%) can be expected to have residuals outside of this range. Assessment of casewise diagnostics suggested that each regression could be considered an accurate model.

Hypothesis 1a, Shame-proneness and the frequency of OITs

The first regression analysis examined predictors of the frequency of OITs (DV = INPIOS). The backwards stepwise regression showed that age, ethnicity, country of residence, OCD symptoms and shame-proneness all made a significant contribution to predicting the frequency of OITs (INPIOS). Therefore, these variables were all entered into the hierarchical regression.

The final regression model (Table 5) was significant (F (5, 293) = 34.37 p < .001) and accounted for 37% of the variance in frequency of OITs. Ethnicity, age and country of residence were entered at step 1, explaining 6% of the variance in frequency of OITs. When considering the control variables, individuals categorized as 'other' ethnic group scored -.33 below individuals categorized as 'white' (reference category = white) in the final model. This suggests that individuals from a black and ethnic minority reported less frequent OITs than individuals who identified as white, British. This difference was significant in the final model. Age also made a significant contribution to the final model, with older people experiencing less frequent OITs. Country of residence alone did not make a significant contribution to the model. At step 2, OCD symptoms (OCI-R) explained a further 27% of the variance. Shame-proneness (ISS), the IV of interest, was added at step 3. Shame-proneness explained an additional 3% of the variance in frequency of OITs when controlling for ethnicity, age, country of residence and OCD symptoms. Suggesting that in line with hypotheses, shame-proneness predicts frequency of OITs over and above OCD symptoms. However, the standardized beta coefficients showed that OCD symptoms had the strongest impact on this model, (β= .43, p < .001) followed by shame-proneness (β = .21, p < .001), race (β = -.16, p = .001) and age (β = -.12, p = .010).

Table 5

Hierarchical multiple regression analyses for hypotheses 1a

		Frequency of OITs (DV)			
Predictor	ΔR^2	B	SE	95% Confidence Interval	
				Lower	Upper
Step 1	.06**				
(Constant)		2.76**	.13	2.50	3.0
Age		-.01**	.01	-.02	-.01
Ethnicity		-.25*	.12	-.49	-.01
Country of residence		-.34	.18	-.69	.01
Step 2	.27**				
(Constant)		2.16**	.13	1.91	2.40
Age		-.01*	.00	-.02	-.00
Ethnicity		-.38**	.11	-.59	-.17
Country of residence		-.26	.15	-.56	.03
OCI-R total		.04**	.00	.03	.04
Step 3	.03**				
(Constant)		1.86	.14	1.6	2.14
Age		-.01*	.00	-.02	-.00
Ethnicity		-.33**	.10	-.53	-.13
Country of residence		-.25	.15	-.53	.04
OCI-R		.03**	.00	.02	.04
ISS		.01**	.00	.00	.01

Note. *p < .05 ** *p* < .01; Unstandardized coefficients = B, SE. Ethnicity coded 0=white 1=other; Country of residence coded 0=UK 1=other; Dependent variable= INPIOS; R^2 for final model= .37

Hypothesis 1b - Shame-proneness and OIT distress

The second regression analysis examined predictors of distress related to OITs (DV = EBRIQ). Backwards-stepwise regression indicated that gender, OCD symptoms and shame-proneness made a significant contribution to predicting OIT distress (EBRIQ), thus, these variables were subsequently entered into a multiple hierarchical regression to predict OIT distress. The final regression model (Table 6) was significant (F (3, 295) = 85.27, p < .001), accounting for 46% variance in OIT distress. Gender was entered at step 1 and explained 4% of the variance in distress related to OITS. Males scored -.76 below females in the final model (reference category = females) in relation to the DV. This suggests that males reported less distress in relation to their OITs than

females. In the final model this gender difference was not significant. At step 2, OCD symptoms (OCI-R) explained 25% unique variance in distress related to OITS. Shame-proneness (ISS), the IV of interest, was added at step 3. Shame-proneness explained an additional 17% of the variance in distress related to OITs when controlling for gender and OCD symptoms. Shame-proneness (ISS) was positively related to OIT distress (EBRIQ). The standardized beta coefficients also support this finding, indicating that shame-proneness had the strongest impact on the model ($\beta = .48$, $p < .001$), followed by OCD symptoms ($\beta = .28$, $p < .001$) and gender ($\beta = -.09$, $p = .053$). These findings confirm that, shame-proneness significantly predicted distress related to OITs over and above OCD symptoms.

Table 6

Hierarchical multiple regression analyses for hypotheses 1b

		Distress relating to OITs (DV)			
Predictor	ΔR^2	B	SE	95% Confidence Interval Lower	Upper
Step 1	.04**				
(Constant)		7.42**	.27	6.9	7.9
Gender (Male vs Female)		-1.75*	.51	-28	-.75
Step 2	.25**				
(Constant)		4.73**	.35	4.04	5.41
Gender (Male vs Female)		-1.54*	.44	-2.4	-.67
OCI-R total		.17**	.02	.14	.20
Step 3	.17**				
(Constant)		1.53*	.45	.66	2.41
Gender (Male vs Female)		-.760	.39	-1.53	.01
OCI-R		.095**	.02	.06	.13
ISS		.10**	.01	.08	.122

Note. *$p < .05$ ** $p < .01$; Unstandardized coefficients = B, SE. Females coded 0, Males coded 1; Dependent variable = EBRIQ total; R^2 for final model= .46

Hypothesis 1c: Shame-proneness and inferences about the self related to OITs

The third regression analysis examined predictors of inferences about the self related to OITs (DV = IRSIS). The backwards-stepwise regression indicated that gender, student status, OCD symptoms and shame-proneness all made a significant contribution to predicting inferences about the self related to OITs (IRSIS). Therefore, these variables were entered into the hierarchical regression. The final model (Table 7) was significant (F (4, 294) = 83.05, $p < .001$) and accounted for 53% of the variance in inferences about the self related to OITs. Student status and gender were controlled for at step 1 and explained 7% of the variance in inferences about the self in relation to OITs. Males scored 2.23 above females (reference category = females) and non-students scored -3.98 below students (reference category = students) in the final model. This suggests that females and non-students reported less negative inferences about the self in relation to their OITs than males and students. Both these differences were significant in the final model. At step 2, OCD symptoms (OCI-R) explained 22% unique variance in inferences about the self related to OITs. Shame-proneness (ISS), the IV of interest, was added at step 3. Shame-proneness explained an additional 24% of the variance in inferences about the self in relation to OITs when controlling for student status, gender and OCD symptoms. Shame-proneness (ISS) was positively related to inferences about the self related to OITs (IRSIS). In the final model, all the predictor variables were significant. When considering the standardized beta coefficients for each predictor variable, shame-proneness had the most impact on the model ($\beta = .57$, $p < 0.01$), followed by OCD symptoms ($\beta = .22$, $p < .001$), student status ($\beta = -.16$, $p < .001$) and gender ($\beta = .09$, $p = .039$). These findings show that shame-proneness significantly predicted negative inferences about the self-related to OITs over and above OCD symptoms.

Table 7

Hierarchical multiple regression analyses for hypotheses 1c

				Inferences about the self relating to OITs (DV)	
Predictor	ΔR^2	B	SE	95% Confidence Interval Lower	Upper
Step 1	.07**				
(Constant)		17.1**	.88	15.38	18.82
Gender (Male vs Female)		-.99	1.47	-3.88	1.91
Student status		-6.54**	1.42	-9.34	-3.74
Step 2	.22**				
(Constant)		9.21**	1.12	7.01	11.41
Gender (Male vs Female)		-.42	1.29	-2.95	2.11
Student status		-5.12**	1.250	-7.6	-2.66
OCI-R total		.47**	.049	.38	.57
Step 3	.24**				
(Constant)		-2.18	1.31	-4.74	.39
Gender (Male vs Female)		2.23*	1.07	.12	4.34
Student status		-3.98**	1.02	-5.99	-1.96
OCI-R		.22**	.045	.13	.31
ISS		.35**	.028	.29	.40

Note. *$p < .05$ ** $p < .01$; Unstandardized coefficients = B, SE. Females coded 0, Males coded 1; Students coded 0, non-students coded 1; Dependent variable = IRSIS. R^2 for final model = .53

Post- hoc analysis

As gender was found to contribute to two of the regression model's, further exploration into the differences between gender on the ISS (shame-proneness measure) was conducted to help explain these relationships. As the data on the shame measure were not normally distributed, a non-parametric test was used. An independent samples Mann-Whitney test found significant differences between male (Md = 32,8, $n = 81$) and female (Md = 41.71, $n = 218$) shame-proneness scores, with females demonstrating significantly higher levels of shame proneness (U = 6577, z = -3.4, $p = .001$, r =-0.19).

Discussion

This study aimed to investigate the relationship between shame-proneness and experiences of OITs, including distress, inferences about the self related to OITs and frequency of OITs, in a nonclinical sample. Consistent with hypotheses, shame-proneness significantly predicted distress and negative inferences about the self related to OITs, over and above OCD symptoms. As shame-proneness increased, distress related to OITs and negative inferences about the self related to OITs also increased. Whilst shame-proneness was also found to be a significant predictor of frequency of OITs, contrary to a priori hypotheses, OCD symptoms were a stronger predictor of frequency of OITs than shame-proneness. Findings relating to the secondary aim of this study were contrary to predictions; people who had high levels of shame-proneness tended to have higher estimations about the prevalence of OITs.

The findings from the current study support and extend research that has found a relationship between shame-proneness and OCRDs (Weingarden & Renshaw, 2015), by asserting that shame-proneness is associated with a specific symptom dimension of OCD (OITs). Thus, extending our understanding about OCD and related constructs.

Contrary to predictions, shame-proneness was a weaker predictor of OIT frequency compared to OCD symptoms. However, this finding makes sense when considering that the frequent presence of OITs is a diagnostic feature of OCD. With this in mind, it may be important to consider the differences in measures used to assess OCD symptoms (OCI-r) and OIT frequency (INPIOS) in this study. The OCI-r is more heavily weighted towards items assessing compulsions and rituals, with only a few items that assess OITs in general terms. Whereas the INPIOS assesses the frequency of experiencing specific OITs in isolation of other OCD symptoms. Despite OITs being a diagnostic feature of OCD, as previously highlighted, a large percentage of the general population can experience OITs frequently without experiencing stress or considerable

impairment (Radomsky et al., 2014). Therefore, in clinical terms, the frequency of intrusive thoughts may be less important than the appraisal (e.g. self-demeaning or catastrophic) that the individual attaches to these experiences.

The finding that shame-proneness was significantly associated with distress related to OITs over and above OCD symptoms, extends our understanding of OITs and shame within the general population. For example, this finding suggests that shame-proneness plays role in whether benign OITs become distressing and classed as clinical experiences of OITs. This is in line with research in a student sample that found OITs were more related to compulsive behaviours in individuals who were higher in shame-proneness (Valentiner & Smith, 2008). Additionally, when considered in relation to cognitive models of OCD (Rachman, 1977) shame-proneness may be an additional vulnerability factor to clinical experiences of OITs. However, inferences of causality are precluded by the cross-sectional design of the current study.

The finding that participants high in shame-proneness were more likely to make negative inferences about themselves based on their OITs (such as 'my intrusive thoughts make me think deep down I am a bad person'; item from the IRSIS measure) also extends current knowledge about experiences of OITs within the general population. When considered in relation to cognitive models of OCD (Belloch et al., 2004), shame-proneness could be understood to directly influence the appraisal of OITs in relation to the self, thus impacting on whether OITs become problematic. The tendency to feel shame in relation to OITs has also been found in experimental and case studies (Clerkin, Teachman, Smith & Buhlmann, 2014; McDermott, 2006). The IRSIS, used to measure inferences about the self related to OITs is a relatively new measure developed by Ferrier and Brewin (2005). The current study both supports Ferrier and Brewin's (2005) findings that there is a relationship between OCD symptoms and

scores on the IRSIS and extends them, by finding a predictive relationship between shame-proneness and scores on the IRISIS.

It is also plausible that negative inferences about the self in relation to OITs could result in high levels of shame proneness. Relatedly, emerging research has highlighted that shame related to OITs can vary depending on the content of OITs (Simonds and Thorpe, 2003). This suggests that certain types of OITs (e.g. ego-dystonic OITs) are especially shame inducing and individuals who experience more ego dystonic OITs may make more negative inferences about the self in relation to this and/or experience more distress.

Overall, the findings suggest that shame-proneness had a larger impact on distress and negative inferences about the self, rather than frequency of OITs. The findings from the current study therefore imply that shame-proneness may influence the appraisal and meaning attached to the OIT and thus affective impact. This is in line with cognitive models of OCD that suggest the interpretation of appraisal of OITs is key in how 'normal' OITs become problematic.

A secondary aim of this study was to explore the relationship between shame-proneness and participants' estimation of the prevalence of OITs in others. Participants who had high levels of shame-proneness tended to make higher estimations about the prevalence of OITs in others, which was unexpected and inconsistent with the study hypothesis. This finding should be interpreted with caution because the measure for estimation of prevalence has not been psychometrically validated. Additionally, the correlation between these variables was only small (r = -.25). However, these preliminary findings indicate that that shame-proneness is not associated with misconceptions about the prevalence of OITs being an uncommon experience. This finding may raise questions about psychoeducation material as a preventative intervention as it suggests that individuals may already have quite an accurate

awareness of the nature of OITs in the general population. Psychoeducation material may therefore target appraisals rather than the individual's direct understanding of the prevalence of OITs, as measured in this study. The finding that individuals with high shame-proneness were more aware of how common OITs are in the general population seems to contrast with research that has found people with OCD and shame often withdraw and find it difficult to discuss their symptoms (Abbey et al., 2007). This could be explained based on the non-clinical sample used within the current study, as it is possible that a clinical sample may not have had the same awareness of the prevalence of OITs. Another possible explanation for this preliminary finding is that although people know OITs are a common experience, they may interpret their own OITs as being especially unacceptable, alarming and shameful. Additionally, people high in shame-proneness may have experienced other mental health difficulties and are therefore more aware of the prevalence of mental health difficulties generally. It is also possible that there is simply no relationship or a very weak relationship between shame proneness and knowledge of the prevalence of OITs. Interpretations of the findings related to the estimation of the prevalence OITs are tentative and need further exploration with validated measures in clinical samples.

The regression analyses highlighted some demographic variables that made a small but significant contribution to the regression model. For example, gender was found to predict a small amount of the variance in distress related to OITs and inferences about the self related to OITs. Further investigation into gender differences in shame-proneness scores showed that females reported significantly higher levels of shame-proneness when compared to males. This supports previous research that has found that females consistently report greater feelings of shame than males (Tangney & Dearing, 2002). Alongside this, research has shown that in adulthood females are affected by OCD at a higher rate than males (Ruscio, Stein, Chiu & Kessler, 2010).

Strengths and limitations

When considering strengths of the current study, a large sample size (n = 299) was recruited which exceeded the number needed for a medium effect size (91). The analyses were therefore sufficiently powered, adding to the scientific rigor of the study. The online and anonymous nature of the questionnaire may have reduced social desirability bias, which is particularly pertinent when considering the questionnaires were asking about personal experiences of OITs and shame. The outcomes of this research make a contribution to the evidence base around the relationship between shame and symptoms of OCD and factors that are implicated in benign OITs becoming clinical OITS.

Based on the continuum hypothesis of OITs, this study aimed to investigate the relationship between OITs and shame-proneness in a non-clinical sample. As an initial exploration of this relationship, it was deemed most appropriate to test the hypotheses on a non-clinical sample, prior to replication and extension with a clinical sample. However, a limitation of using a non-clinical sample is the limited generalizability of the findings to a clinical population. With this in mind, a recent review of the OCD literature (Abramowitz et al., 2014) asserted that obsessive compulsive symptoms are experienced on a continuum and using a non-clinical sample in research is justified and relevant to clinical samples, thus supporting the generalizability of these findings.

Although a non-clinical sample was recruited in the current study, a high percentage of participants scored within the clinical range on the OCI-R (27%). OCD has been found to affect 2-3% of the population (Kessler et al., 2005). Research has found that the prevalence of mental health difficulties are generally higher within student populations (Stallman, 2010). In addition, previous research utilizing the OCI-r with a non-clinical university sample have reported similar clinical rates between 22% - 32% (Emerson, Heapy & Garcia-Soriano, 2017; Weingarden & Renshaw, 2014).

Therefore, the proportion of participants that scored within the clinical range in the current study may be partly explained by to the large percentage of student participants. In support of this, student status was found to be a predictor of negative inferences about the self-related to OITs in the current study. The high number of participants that scored within the clinical range may have increased the generalizability of the findings to individuals with a diagnosis of OCD. It is possible that the participants who scored above the clinical cut off would meet diagnostic criteria for OCD but are not at the stage where they seek treatment for this. There is a large evidence base suggesting that individuals with OCD can wait on average about 10 years from experiencing initial symptoms before presenting to services (Grant, Pinto, Gunnip, Mancebo , Elsen & Rasmussen, 2006). Linking with the aims of this study, one barrier to seeking help and treatment may be feelings of shame (Marques et. al., 2010). It is possible that the high levels of reported OCD symptoms may have been influenced by the self-selection method of recruitment into the survey. Additionally, participants may have had other mental health difficulties or diagnoses that were not controlled for as part of this study.

When considering sample characteristics, there was minimal ethnic variation in the sample, thus reducing the generalizability of the findings. In relation to this there was also an issue of measurement as the pre-set question within the software had limited options for the participant to select in terms of ethnicity. For example, ‘white’ was one option available but this could include a lot of variability that was not accounted for. Additionally, ‘country residing in’ doesn’t provide any information regarding the individuals cultural background. In future research in this area greater consideration of culture needs to be taken, especially given that previous research has found cultural differences in the experiences of OITs cross culturally (Radomsky et al., 2014).

The cross-sectional design of the study precludes conclusions about the direction of the observed relationships or underlying causality. Additionally, the measure used to assess estimation of prevalence of OITs was not a validated measure. Therefore, it is unclear whether it is measuring the construct it is supposed to, making it difficult to assess the validity and reliability of the findings when this measure was used in the analysis. Despite all the other measures used demonstrating reliability and validity, there are limitations to using self-report measures, such as response bias.

Clinical implications.

The ability to draw clinical implications from the findings of the current study is supported by the continuum model of OITs. This suggests that research into experiences of OITs using non-clinical samples has useful clinical implications in terms of prevention. The findings that shame-proneness predicted a significant proportion of the variance in distress and inferences about the self related to OITs may have useful clinical applications. For example, they indicate that the use of preventative OCD public awareness campaigns that target shame-proneness and shame-based appraisals of OITs may reduce vulnerability of OITs becoming distressing and problematic.

Based on these findings, it may also be useful assess and target shame within psychoeducation and intervention stages of well-established treatments for OCD such as cognitive behavioural therapy (CBT) including exposure and response prevention (National Institute for Health and Care Excellence [NICE], 2005). Additionally, when using cognitive models of OCD, exploring shame in terms of appraisals of OITs (e.g. negative inferences about the self related to OITs) may be useful. As highlighted by Ferrier and Brewin (2005), in some cases it may also be useful to explore and focus on deep rooted beliefs about the self (such as high levels of trait shame-proneness) within psychological therapy, rather than focusing on beliefs about OITs.

Future directions

As this study demonstrated significant findings, an important next step will be to replicate it within a clinical sample. Additionally, as this research can only tell us about relationships and predictors it may be useful for future research to extend this by researching causality. With this in mind, longitudinal research that tracks the development of obsessions from OITs and the role of shame-proneness within this may provide further useful information about the nature of these relationships. Investigating any changes in experiences of OITs following psychological interventions that target shame may also provide further, more specific information on the relationship between these variables. For example, by investigating whether targeting shame-proneness within interventions reduces distress related the OITs and negative inferences about the self related to OITs, a suggestion also made by Ferrier and Brewin (2005). Additionally, it may be useful for future research to investigate whether shame-proneness predicts specific themes of OITs that lead to more distress.

In order to investigate the relationship between shame-proneness and knowledge about the prevalence of OITs in the general population, the development of a validated measure to assess knowledge of OCD symptoms will be necessary. This would allow further research into the mechanisms behind normalization and psychoeducation interventions and any role that shame may have within this.

Finally, in terms of the definition and measurement of shame, Goss et al., (1994) make the distinction between state shame (transient experiences of shame in specific situations) and trait shame (a more global, internalized experience; Goss, Gilbert & Allan, 1994). The ISS measure used in this study measures trait shame and so it may be important to investigate different types of shame and see how this may be similar or different to the relationship found in this study.

Conclusion

This study aimed to investigate the relationship between shame-proneness and experiences of OITs. Shame-proneness was found to be the strongest predictor of both distress and inferences about the self related to OITs, but was secondary to symptoms of OCD when predicting frequency of OITs. Overall these findings suggest that there is a relationship between shame proneness and OITs, a specific symptom dimension of OCRDs. This finding is an important consideration when using cognitive models of OCD and working with people who experience distressing OITs.

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Appendix A – Recruitment advertisements

Staff and student volunteer list recruitment advert

Are you aged 18 or above and interested in taking part in an online questionnaire study about intrusive thoughts? Those who take part will be entered into a prize draw to win one of two £25 cash prizes!

Obsessive intrusive thoughts are thoughts that "pop" into your head uninvited and may interrupt you. They can be difficult to control and some people experience them as unpleasant or upsetting. They can be experienced as thoughts, images or urges. We are interested in finding out more about personal experiences of obsessive intrusive thoughts and why some people find them upsetting and others don't.

The research is entirely online and involves providing your answers to a number of questions. The online survey will take about 30 minutes to complete.

For more information or if you would like to take part, you can follow the link below: *(link to online questionnaire)*

If you would like any further information about this study, please contact Lucy Nield (lnield2@sheffield.ac.uk)

Social media recruitment adverts

Facebook: Are you interested in taking part in an online questionnaire study about intrusive thoughts with a chance to win a £25 amazon voucher? Please click on the following link to find out more:

https://sheffieldpsychology.eu.qualtrics.com/jfe/form/SV_3TWTucmWiPUvjY9

Participation is confidential so please don't 'like' or comment on this post!

Twitter: 'Are you interested in taking part in an online questionnaire study about intrusive thoughts? Please click the link to find out more: *post link*

Appendix B - Information sheet

You are invited to participate in a research project. Please take the time to read the information below carefully to help you decide whether you would like to participate.

Obsessive intrusive thoughts are thoughts that "pop" into your head uninvited. They can be difficult to control and some people experience them as unpleasant or upsetting. They can be experienced as thoughts, images or urges. We are interested in finding out more about personal experiences of obsessive intrusive thoughts and why some people find them upsetting and others don't.

This is an online study that asks you about your personal experiences of obsessive intrusive thoughts. The whole online survey should take around 30 minutes to complete and your progress is indicated at the top of each page. All participants will be entered into a prize draw with the chance to win 2 x £25.

We are contacting students by e-mail to see if they would like to take part in this research. You need to be aged 18 or over to participate. Your participation is entirely voluntary and you are free to withdraw from the study by closing down the online survey before it is completed. All the information you provide us with will be treated as strictly confidential and will always remain anonymous. Once you have completed the online survey, your data will become anonymous and it will no longer be possible to withdraw from the study. You will not be able to be identified in any publications or reports.

Some of the questions ask about experiences that some people may find distressing. If at any point during the study you feel distressed or concerned about your mental health, then please book an appointment to see your GP. Further information and support can be found from the following sources:

- Mind
- No Panic
- OCD action
- OCD-UK
- Anxiety UK
- Samaritans

- Nightline

This research is being completed as part of a clinical psychology doctorate. This research has been approved via the university ethics review procedure. If you have any questions about the study, then you can contact the researchers: Lucy Nield (lnield2@sheffield.ac.uk) and Dr Lisa-Marie Emerson (l.emerson@sheffield.ac.uk).

If you wish to make a complaint about this research, please contact:
Amrit Sinha, Research Support officer
E-mail: a.sinha@sheffield.ac.uk
Address: Clinical Psychology Unit, Floor F, 1 Vicar Lane, Sheffield S1 1HD

If you feel that your complaint has not been handled to your satisfaction following this, you can contact:
Dr Andrew West, University Secretary
E- mail: registrar@sheffield.ac.uk
Mrs Sandra Ibbotson, Personal Assistant to the University Secretary
Email s.ibbotson@sheffield.ac.uk
Telephone 0114 222 1051

Appendix C - Consent form

If you would like to participate, then please check the box below to confirm that:

- You have read and understood the information about this online survey and have had the opportunity to ask questions (by emailing the researchers).
- You understand that participation is voluntary and that you are free to close the survey prior to completing it to withdraw from the study, without giving any reason.
- Your responses will be kept confidential.
- You will not copy, save, store or reproduce the questionnaires contained in this survey.

- I agree to take part in the above study (and I am above 18 years of age)
- I DO NOT agree to take part in the above study

Appendix D – Debrief

Thank you for your participation in our research. You have completed all questionnaires and reached the end of the study. You will be contacted via your university e-mail if you are the lucky winner of one of the £25 amazon voucher prizes.

Below you will find information relating to the aims of the research and the questionnaires that you completed. There is also information on sources of help. Please take the time to read this page; you can also save or print this page to refer to.

If you would be interested in participating in future research on obsessive intrusive thoughts, then please enter your email address below. You will be added to our database of potential participants and receive information about upcoming research studies.

What was this study about?

The study that you participated in is investigating experiences of obsessive intrusive thoughts. Obsessive intrusive thoughts are thoughts that "pop" into your head uninvited and may interrupt you. They can be difficult to control and some people experience them as unpleasant or upsetting. They can be experienced as thoughts, images or urges. We are interested in finding out more about personal experiences of obsessive intrusive thoughts and why some people find them upsetting and others don't. We are particularly interested in whether shame is related to experiences of obsessive intrusive thoughts (including distress, frequency and inferences about the self). We are also interested if there is a relationship between shame and the estimation of the prevalence of obsessive intrusive thoughts.

The online survey that you completed asked you about your experiences of obsessive intrusive thoughts. The data we have collected is anonymous and we are unable to provide individual feedback on questionnaire results. You can click the links below to read more about each questionnaire:

Prevalence of obsessive intrusive thoughts

In the online questionnaire, you were asked the following question:

"A study looked at how common obsessive intrusive thoughts are in the general

population. They asked 777 students in 13 different countries were asked about their experiences of obsessive intrusive thoughts. Please estimate what percentage of these people said they had experienced at least 1 obsessive intrusive thought in the last 3 months? If you're not sure, have a guess!"

This question was based on research by Radomsky et al. (2014). They found that 93.6% of their participants reported experiencing at least 1 obsessive intrusive thought in the last 3 months.

Internalized shame Scale (ISS; Cook, 1993).

This measure assesses level of internal shame. In this study, participants' scores on the ISS will be analyzed to see if they predict experiences of OITs.

The Obsessive Intrusive Thoughts Inventory (INPIOS: Garcia-Soriano et al., 2011).

The INPIOS is a measure of obsessive intrusive thoughts. The questions asked you how often you experience different obsessive intrusive thoughts. In this study, participants' scores on the INPIOS will be analyzed to see if frequency of obsessive intrusive thoughts is related to shame and distress.

Intrusion – related self inference scale (Ferrier & Brewin, 2005)

This measures how far intrusions lead to negative inferences about the self. The scores from this questionnaire will be analyzed to see if the scores have a relationship with the shame scores.

The Obsessive-Compulsive Inventory (OCI-R: Foa et al., 2002)

This measure assesses symptoms of Obsessive-Compulsive Disorder.

Some of these questionnaires include questions that people can find distressing. If you do feel distressed or concerned about your mental health, then please book an appointment to see your GP. Further information and support can be found from the following sources:

- Mind

- No Panic
- OCD action
- OCD-UK
- Depression Alliance
- Anxiety UK
- Samaritans
- Nightline

If you have any questions about the study, then you can contact the researchers: Lucy Nield (lnield2@sheffield.ac.uk) and Dr Lisa-Marie Emerson (l.emerson@sheffield.ac.uk).

If you wish to make a complaint about this research, please contact:
Amrit Sinha, Research Support officer
E-mail: a.sinha@sheffield.ac.uk
Address: Clinical Psychology Unit, Floor F, 1 Vicar Lane, Sheffield S1 1HD

If you feel that your complaint has not been handled to your satisfaction following this, you can contact:
Dr Andrew West, University Secretary
E- mail: registrar@sheffield.ac.uk
Mrs Sandra Ibbotson, Personal Assistant to the University Secretary
Email s.ibbotson@sheffield.ac.uk
Telephone 0114 222 1051

Appendix E – Ethical Approval

The University Of Sheffield.

Downloaded: 07/02/2017
Approved: 06/02/2017

Lucy Nield
Registration number: 150123842
Psychology
Programme: Clinical psychology

Dear Lucy

PROJECT TITLE: The relationship between shame and experiences of obsessive intrusive thoughts in a nonclinical sample.
APPLICATION: Reference Number 012009

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 06/02/2017 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 012009 (dated 17/01/2017).
- Participant information sheet 1026618 version 1 (17/01/2017).
- Participant consent form 1026619 version 1 (17/01/2017).

The following optional amendments were suggested:

One of the reviewers has commented that - The issues identified below (extracted from the other reviewer) can be addressed by adding in aspects from the proposal that went through the DClin review process. Given the extent of the scientific concerns please ensure that the issues below are in fact addressed within the DClin proposal and if necessary submit a revised proposal to the research support secretary.1 1. Consider including a community sample or at least draw on other available volunteer lists. 2. Ensure that the proposal indicates which of the measures will be able to determine the extent of clinical caseness in the sample and how this will be achieved. 3. Ensure that the proposal lodged with the research support secretary has a power calculation and details of sampling method. 4. Ensure the vouchers are a 'thank you' rather than labelled as an incentive.

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Yours sincerely

Thomas Webb
Ethics Administrator
Psychology

Appendix F - Estimation of the prevalence of OITs

Obsessive intrusive thoughts are thoughts that suddenly INTRUDE INO OUR MINDS against our will and INTERRUPT what we are doing or what we are already thinking.

Frequently, it is DIFFICULT TO CONTROL these unwanted intrusive thoughts. No matter how hard we try, it can be difficult to get them out of our mind or stop them from re-appearing.

The unwanted intrusive thoughts are usually UNCOMFORTABLE, UNPLEASANT and sometimes UNACCEPTABLE, because they refer to things we do not like to think about. As well they may be opposite to our beliefs, our values or our sense of ethics or morality. Sometimes that thoughts are simply seem quite strange or bizarre.

These unwanted intrusive thoughts are known as "MENTAL INTRUSIONS" and they occur in our minds in one of the following forms:

1) *As IMAGES, that is to say, as puctures that suddenly appear in our heads*
2) *As a STRONG URGE to do or say something*
3) *Or, just as THOUGHTS about something*

A study looked at how common obsessive intrusive thoughts are in the general population. They asked 777 students in 13 different countries were asked about their experiences of obsessive intrusive thoughts. Please estimate what percentage of these people said they had experienced at least 1 obsessive intrusive thought in the last 3 months? If you're not sure, have a guess!"

Appendix G - The Internalised Shame Scale

Copyrighted measure removed.

Appendix H - The Obsessive Intrusive Thoughts Inventory - Part 1

INPIOs[1]

This questionnaire deals with a variety of upsetting and unpleasant thoughts that most people experience from time to time. These thoughts may suddenly **INTRUDE INTO OUR MINDS** against our will and **INTERRUPT** what we are doing or what we are already thinking.

Frequently, it is **DIFFICULT TO CONTROL** these unwanted intrusive thoughts. No matter how hard we try, it can be difficult to get them out of our mind or stop them from re-appearing.

The unwanted intrusive thoughts are usually **UNCOMFORTABLE**, **UNPLEASANT**, and sometimes **UNACCEPTABLE**, because they refer to things we do not like to think about. As well they may be opposite to our beliefs, our values or our sense of ethics or morality. Sometimes that thoughts are simply seem quite strange or bizarre.

These unwanted intrusive thoughts are known as **"MENTAL INTRUSIONS"**, and they occur in our minds in one of the following forms:

1. As **IMAGES**, that is to say, as pictures that suddenly appear in our heads
2. As a **STRONG URGE** to do or say something
3. Or, just as **THOUGHTS** about something

- We are interested in knowing if you have also experienced **MENTAL INTRUSIONS**.
- Listed below are thoughts, most of which were reported by a group of undergraduate students in a previous study. Beside each of them is a scale that ranges between '0' (I have never had) and '6' (I always have).
- Rate **HOW OFTEN** you have each of the thoughts listed. Remember that they can occur as **images**, **thoughts** or **strong urges to do or say something**. Do not think a lot about the answers. There are no good or bad, or correct or incorrect answers. All the information obtained will be used confidentially, so that no one will know who has given the answers.
- In the second part of the questionnaire, we are going to ask you to answer some questions related to your most unpleasant mental intrusion.

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[1] Inventario de Pensamientos Intrusos Obsesivos (INPIOs-48 items). Based on the Revised Obsessional Intrusions Inventory (ROII, D.A. Clark & Ch. Purdon, 1993,1994). Developed by: OCD Research Group directed by Amparo Belloch (University of Valencia, Spain), in collaboration with Prof. Dr. David Clark, University of New Brunswick (Canada). Information: Amparo.Belloch@uv.es

0. **NEVER:** I have never had this intrusion
1. **RARELY:** I have had this intrusion once or twice in my life.
2. **OCCASIONALLY:** I have this intrusion a few times a year.
3. **SOMETIMES:** I have this intrusion once or twice a month.
4. **OFTEN:** I have this intrusion once or twice a week.
5. **VERY OFTEN:** I have this intrusion daily.
6. **ALWAYS:** I have this intrusion frequently during the day.

While driving, I have had unacceptable mental intrusions of:								
1.	Hitting someone (pedestrians, animals, etc.) or causing an accident.	0	1	2	3	4	5	6
2.	Smashing into something (e.g., store window, tree, poles, etc.)	0	1	2	3	4	5	6
When using a sharp object (knife, razor scissors, etc.) or a tool, I have had mental intrusions of:								
3.	Cutting or stabbing myself with the knife (scissors, etc.).	0	1	2	3	4	5	6
4.	Cutting or stabbing a stranger with the knife (scissors, etc.).	0	1	2	3	4	5	6
5.	Injuring or hurting someone close to me (family member, close friend)	0	1	2	3	4	5	6
When in a high place (like a cliff, bridge, high building, etc.), I have had mental intrusions of:								
6.	Jumping off a high place	0	1	2	3	4	5	6
7.	Pushing someone off a high place	0	1	2	3	4	5	6
When near traffic or the railway/subway, I have had mental intrusions of:								
8.	Jumping in front of a train, subway or car.	0	1	2	3	4	5	6
When around others, and without anyone provoking me, I have had mental intrusions of:								
9.	Physically harming (punching, hitting, kicking, etc) strangers or animals	0	1	2	3	4	5	6
10.	Physically harming (punching, hitting, bumping, etc.) people around me	0	1	2	3	4	5	6
When with people, and without being provoked, I have had mental intrusions of:								
11.	Saying something inappropriate, bothering or insulting to a stranger	0	1	2	3	4	5	6
12.	Saying something rude to or insulting someone I know (family member, friend)	0	1	2	3	4	5	6
13.	That the fly of my pants is unzipped or that my blouse is unbuttoned	0	1	2	3	4	5	6
Not being angry, and without being provoked, I have had mental intrusions of:								
14.	Robbing or stealing money (in a shop, from someone, etc.), even though I don't really need it	0	1	2	3	4	5	6
15.	Breaking or destroying something on purpose (a dish, an ornament, scratching the paint of a car, "painting graffiti", etc.)	0	1	2	3	4	5	6
Out of the blue and for no particular reason, I have had mental intrusions of:								
16.	Having sex with a person who I would never want to have sex with	0	1	2	3	4	5	6
17.	Engaging in sexual activity that goes against my sexual preference (i.e. homosexual, heterosexual, animals, cadavers, etc.)	0	1	2	3	4	5	6
Out of the blue and for no particular reason, I have had mental intrusions of:								
18.	Engaging in sexual activity that seems inappropriate or repugnant	0	1	2	3	4	5	6
19.	Having sex in a public place	0	1	2	3	4	5	6
20.	Undressing, looking at the genitals of, or having sex with strangers	0	1	2	3	4	5	6
When in the presence of religious symbols or images, or in a place of worship, I have had mental intrusions of:								
21.	Swearing or shouting obscenities out loud	0	1	2	3	4	5	6
22.	Insulting a religious authority (i.e. priest, rabbi, nun, etc.)	0	1	2	3	4	5	6

0. **NEVER:** I have never had this intrusion
1. **RARELY:** I have had this intrusion once or twice in my life.
2. **OCCASIONALLY:** I have this intrusion a few times a year.
3. **SOMETIMES:** I have this intrusion once or twice a month.
4. **OFTEN:** I have this intrusion once or twice a week.
5. **VERY OFTEN:** I have this intrusion daily.
6. **ALWAYS:** I have this intrusion frequently during the day.

Out of the blue and for no particular reason, I have mental intrusions of:								
23.	Images related to repugnant or morbid themes (i.e. dead bodies, violence, etc.)	0	1	2	3	4	5	6
24.	Existential doubts that make no sense (i.e. about myself, my feelings, life, the world, etc.)	0	1	2	3	4	5	6
Even when a place (i.e. my office, my house) looks tidy or right, I have had mental intrusions of:								
25.	The documents, papers, etc. are out of order or not in their place	0	1	2	3	4	5	6
26.	Some objects (i.e. pieces of furniture, clothes, CDs, etc.) are not correctly organized, or not following a certain order (i.e. symmetry, colour, etc.)	0	1	2	3	4	5	6
27.	The idea that certain things should be in "their" place	0	1	2	3	4	5	6
In my daily life,								
28.	I need to follow a certain order when doing some activities like dressing myself, undressing, or washing, etc.	0	1	2	3	4	5	6
When in a public place, I have had mental intrusions of:								
29.	That I might have become contaminated or contracted a disease by touching things strangers have touched (i.e. doorknobs, a toilet seat cover, money, public telephone, etc.).	0	1	2	3	4	5	6
Even though I know it probably is not true, I have had mental intrusions of:								
30.	Having left something on at home (i.e. kitchen, gas, heat, stove, lights, cigarette, etc.)	0	1	2	3	4	5	6
31.	Having left something unlocked at home (i.e. the door, a window, etc.)	0	1	2	3	4	5	6
32.	Having left the taps running in the house/apartment	0	1	2	3	4	5	6
33.	Having made a mistake at work or school (i.e., having misunderstood a text, incorrect answer on exam, not written down lecture notes correctly, etc.)	0	1	2	3	4	5	6
34.	Having left something dangerous (i.e. glasses, toxic products, etc.) in a place where children have access.	0	1	2	3	4	5	6
35.	Having forgot something important	0	1	2	3	4	5	6
Suddenly, and even though I know it's probably not true, I've had mental intrusions of:								
36.	Whether I have done something or not (i.e. have I watered the plants?")	0	1	2	3	4	5	6
37.	Whether I could have hurt myself or contracted a disease	0	1	2	3	4	5	6
38.	Whether I could have accidentally caused a tragedy	0	1	2	3	4	5	6
39.	Whether I could have offended someone without realizing it	0	1	2	3	4	5	6
40.	Whether I will need something in the future that I was going to throw out because I haven't used it for a long time (i.e. old clothes, newspapers, empty bags or boxes, etc.)	0	1	2	3	4	5	6

0. NEVER: I have never had this intrusion
1. RARELY: I have had this intrusion once or twice in my life.
2. OCCASIONALLY: I have this intrusion a few times a year.
3. SOMETIMES: I have this intrusion once or twice a month.
4. OFTEN: I have this intrusion once or twice a week.
5. VERY OFTEN: I have this intrusion daily.
6. ALWAYS: I have this intrusion frequently during the day.

Even though I know it is not likely, I have had mental intrusions of:								
41.	Being dirty or contaminated, although I have not touched anything dirty.	0	1	2	3	4	5	6
42.	Being contaminated because of contact with people, places, or things that are unpleasant to me for some reason.	0	1	2	3	4	5	6
43.	Being dirty or contaminated due to contact, however brief, with body secretions (i.e. sweat, spit, urine, etc.)	0	1	2	3	4	5	6
44.	Being contaminated or contracting a disease due to contact with a toxic or poisonous substance (i.e. domestic products, plants, etc.) or pollutant (i.e. trash, residues, etc.).	0	1	2	3	4	5	6
Even though I know it is not likely, I have had mental intrusions:								
45.	That some actions or situations can cause future misfortunes or bad luck in general (i.e. walking under a ladder, seeing a black cat, someone looking at me sideways, etc.)	0	1	2	3	4	5	6
46.	That some thoughts or images can cause future misfortunes or bad luck in general (i.e., having bad thoughts could cause something bad to happen to someone, thinking about unlucky numbers, imagining a disaster)	0	1	2	3	4	5	6
47.	That failure to touch some objects or failure to repeat certain actions could cause future misfortune or bad luck in general	0	1	2	3	4	5	6
48.	That not following certain order or habits in my daily life (i.e. dressing, going to bed, etc.) could cause future misfortunes or bad luck in general.	0	1	2	3	4	5	6
I also have these other mental intrusions:								
49.		0	1	2	3	4	5	6
50.		0	1	2	3	4	5	6

Appendix I - Emotional and Behavioural Reactions to Intrusions Questionnaire

Emotional and Behavioural Reactions to Intrusions Questionnaire

Intrusive thoughts are spontaneously occurring thoughts that "pop" into your head without effort and capture your attention

This question is about how you react to intrusive thoughts.

Please rate each statement using the scale provided (Scale: 0 = never; 4 = every time)

When you have an intrusive thought, how often do each of the following statements apply:

1. It makes me feel I am losing control of my thoughts
2. It makes me feel miserable
3. It distracts me from what I am doing
4. I act on the thought
5. It makes me anxious
6. It interferes with how well I carry out what I'm doing
7. It makes me irritable

Appendix J - Intrusion Related Self Inference Scale

INTRUSION RELATED SELF INFERENCE SCALE

We are interested in what you think about your intrusive thoughts that you had in the last two weeks. Intrusive thoughts are thoughts that suddenly come into your mind. They may occur in the form of words, mental images, or impulses. Research has shown that most people experience these thoughts which they find unacceptable in some way, so there is nothing unusual about this.

Some examples of unpleasant intrusions include:

-Repeated image of attacking someone

-Suddenly thinking you have left the door unlocked

-Suddenly thinking your hands are dirty and you may cause contamination.

For each statement below, choose the reply which best fits what you think. Rate your replies as follows:

0- Not at all
1- A little
2- Quite a lot
3- A lot
4- Very much

Some of my intrusive thoughts make me:

1. Think that deep down I am a bad person. ☐
2. Fear I am not the type of person I ought to be. ☐
3. Worry that I may do something that would cause others to disown me. ☐
4. Fear I will become someone other people will think is unacceptable. ☐
5. Worry about the type of person I really am. ☐
6. Worry that if people really knew me they would think I was a bad person. ☐
7. Feel that if other people really knew me they would reject me. ☐
8. Try not to think about the person I might be. ☐
9. Fear what I might be capable of doing. ☐
10. Feel guilty ☐
11. Worry I will be seen as a wicked person by others ☐
12. Feel that other people would think negatively of me if they knew what went through my mind ☐

Appendix K - Obsessive Compulsive Inventory – Revised

OCI-R

The following statements refer to experiences that many people have in their everyday lives. Circle the number that best describes **HOW MUCH** that experience has **DISTRESSED or BOTHERED you during the PAST MONTH.** The numbers refer to the following verbal labels:

0 Not at all	1 A little	2 Moderately	3 A lot	4 Extremely

1.	I have saved up so many things that they get in the way.	0 1 2 3 4
2.	I check things more often than necessary.	0 1 2 3 4
3.	I get upset if objects are not arranged properly.	0 1 2 3 4
4.	I feel compelled to count while I am doing things.	0 1 2 3 4
5.	I find it difficult to touch an object when I know it has been touched by strangers or certain people.	0 1 2 3 4
6.	I find it difficult to control my own thoughts.	0 1 2 3 4
7.	I collect things I don't need.	0 1 2 3 4
8.	I repeatedly check doors, windows, drawers, etc.	0 1 2 3 4
9.	I get upset if others change the way I have arranged things.	0 1 2 3 4
10.	I feel I have to repeat certain numbers.	0 1 2 3 4
11.	I sometimes have to wash or clean myself simply because I feel contaminated.	0 1 2 3 4
12.	I am upset by unpleasant thoughts that come into my mind against my will.	0 1 2 3 4
13.	I avoid throwing things away because I am afraid I might need them later.	0 1 2 3 4
14.	I repeatedly check gas and water taps and light switches after turning them off.	0 1 2 3 4
15.	I need things to be arranged in a particular way.	0 1 2 3 4
16.	I feel that there are good and bad numbers.	0 1 2 3 4
17.	I wash my hands more often and longer than necessary.	0 1 2 3 4
18.	I frequently get nasty thoughts and have difficulty in getting rid of them.	0 1 2 3 4

Obsessive-Compulsive Inventory – Revised (OCI-R)

Administration & Scoring

The OCI-R is a short version of the OCD (Foa, Kozak, Salkovskis, Coles, & Amir, 1998) and is a self-report scale for assessing symptoms of Obsessive-Compulsive Disorder (OCD). It consists of 18 questions that a person endorses on a 5-point Likert scale.

Scores are generated by adding the item scores. The possible range of scores is 0-72. Mean score for persons with OCD is 28.0 (*SD* = 13.53). Recommended cutoff score is 21, with scores at or above this level indicating the likely presence of OCD.

Reference:

Foa, E.B., Huppert, J.D., Leiberg, S., Hajcak, G., Langner, R., et al. (2002). The Obsessive-Compulsive Inventory: Development and validation of a short version. *Psychological Assessment, 14,* 485-496.