

***Betrayal Responses and Personality
Pathology: The Development of the Betrayal
Response Scale.***

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D.Clin.Psych.thesis (Volume 1)

2016

University College London

UCL Doctorate in Clinical Psychology

Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, **I** confirm that this has been indicated in the thesis.

Signature:

Name: Mrs Kemi Komolafe

Date: 10th June 2016

Overview

The overall focus of the thesis is the development of a psychometric measure that assesses for responses to betrayal within a population of individuals with personality trait pathology. This thesis consists of three parts. Part one presents a systematic literature review on the relationship between mental contamination and psychopathology. The review suggests that mental contamination contributes to the development of features of OCD and PTSD psychopathology.

Part two consists of an empirical paper on the development of the Betrayal Response Scale within the personality pathology trait population. This study was conducted as part of a joint project. The results suggest that the Betrayal Response Scale (BRS) is a reliable and valid measure of betrayal responses. The BRS was found to consist of two subscales, one assessed for negative interpersonal responses (NIR) and the other, internalised negative emotions (INE). The BRS assessed for psychosocial impairment following betrayal trauma. The implications of the findings in relation to the assessment and treatment of individuals with personality pathology are discussed, along with the study limitations and implications for future research.

Part three is a critical appraisal of the research process. Issues relating to ethics, recruitment and defining the construct of betrayal are discussed. The implications for future research are also considered.

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Acknowledgments

I am incredibly thankful to God, my much neglected friends, Bukola and my family for their encouragement and patience.

To my supervisor, Dr Janet Feigenbaum, the IMPART team, particularly Dr Niamh Moriarty, for their expertise and advice. Thanks to my fellow trainee, Rakhi Shah for her support and clear thinking during the challenging parts of the process.

To all of those who took the time to partake in, and promote the study to help raise money for such important charities, thank you.

To the staff and administrative team in the Clinical Psychology department at UCL, for providing a nurturing environment and an inspirational institute that has proven to be a great motivator.

Finally, a huge thank you to James, who remained ever patient, thoughtful and encouraging with each step.

Part 1: Literature Review

Does Mental Contamination Contribute to the Development and Maintenance of Psychopathology?

Abstract

Aims

This systematic literature review aimed to evaluate the literature investigating the association between mental contamination (and mental pollution) and psychopathology.

Method

A systematic literature search was conducted using PsycINFO, EMBASE and MEDLINE databases. Once the necessary exclusion criteria was applied, 26 papers were identified as appropriate for review.

Results

The studies suggest that mental contamination may contribute to the development and maintenance of OCD and PTSD symptomatology. In addition to this, the presence of mental contamination was also found to be associated with cognitive biases and experiences of disgust, these features are known to be responsible for the development of various mental health conditions.

Conclusions

The findings of the current review illustrate the impact of mental contamination in the development and maintenance of psychopathology. However, methodological issues within the studies highlight the need for further research to improve our understanding of this relationship.

1. **Introduction**

“How is it possible to repeatedly wash and yet remain dirty?” Rachman (1994)

This question posed by Rachman (1994) led to a re-conceptualisation of contamination fears in the context of Obsessive Compulsive Disorder (OCD).

Prior to Rachman’s input, investigations into contamination fears focused on the patient’s preoccupation with harm following direct contact with observable dirt (such as soiled or decaying matter). This was referred to as contact contamination fear given the necessary condition of contact with the contaminant in order for fear to be evoked.

Extensive research into contact contamination fears led to the development of a form of treatment known as Exposure and Response Prevention therapy (ERP). This is a systematic process of exposing an individual to the feared contaminant. Anxiety is purposely provoked through exposure and the individual is restricted from carrying out rituals, or safety behaviours, believed to prevent the feared outcome. ERP facilitates habituation to feelings of anxiety and extinguishes the use of compulsive rituals. Following its introduction into clinical practice in the twentieth century, it remains a widely recognised efficacious intervention for clients suffering from contamination fears (Ponniah, Magiati & Hollon, 2013; Whittal, Thordarson, McLean, 2005). Whilst some debate remains on the most effective methodological application of exposure and response prevention therapy, ERP is well endorsed as an appropriate treatment intervention. So much so that the National Institute of Clinical Excellence guidelines (NICE, 2005) proposed that ERP be integrated into cognitive behavioural therapy (in a variety of guises; group, individual and low intensity) as a primary therapeutic intervention to alleviate the symptoms of OCD.

Though effective, the limitations of ERP became apparent when a subgroup of individuals with contact contamination fears exhibited spontaneous relapse and poor adherence to the treatment (Rachman, 1994). The author suggests that this unexpected response was due to an important variance in the contamination fears experienced by this population. A second type of contamination fear based on feelings of internal dirtiness, rather than external dirtiness, was proposed. This distinction gave birth to a cognitive phenomenon known as mental pollution and with that, the knowledge base and treatment interventions for contamination fears was forced to expand. Several lines of research have since identified evidence of this construct as an underlying feature within a range of psychological disorders such as Post-Traumatic Stress Disorder (PTSD) and OCD (Cogle, Lee & Horowitz, 2008; Fairbrother & Rachman, 2004). Similarly, emerging evidence has suggested specific variables such as disgust or cognitive biases may mediate the influence of mental contamination on psychopathology (Olatunji, Cisler, McKay et al. 2010; Radomsky & Elliott, 2009).

Contamination fears

Cleaning compulsions, the product of contamination fears, have been noted as the second most common form of compulsion within OCD populations (Rasmussen and Eisen, 1992; Rachman and Hodgson, 1980). Contamination fears are defined as a persistent and intensely felt sense of being polluted or made dirty following contact (direct or indirect) with an entity thought to be infected or impure (Rachman 2006). It should be noted that these feelings of dirtiness are not exclusively a clinical phenomenon; instead, they exist on a continuum within the general population.

Consensus exists on what one may consider to be a contaminant or pollutant; bodily excretions, chemicals or soiled and decaying matter may serve as examples of such. In the general population, the sense of dirtiness dissipates as the contaminant is removed and the area in contact with the contaminant is sufficiently cleaned. Within the clinical population however, cleaning will only offer temporary relief. The sense of being polluted becomes associated with triggers in the individual's environment that may well extend beyond common pollutants recognised within the general population.

The presence of these triggers leads to increased levels of anxiety. In order to alleviate the escalating levels of anxiety, the individual engages in compulsive cleaning rituals. Classical conditioning and operant conditioning underlie the maintenance of these cleaning compulsions. When successful, ERP encourages a greater tolerance of anxiety and the use of alternative coping strategies as a means to manage anxious feelings.

Mental pollution holds some similarity to contact contamination in that there is an experienced sense of dirtiness and as a consequence an urge to clean arises. However, contact contamination is dependent on the presence of a physical contaminant, whilst mental pollution holds a "slight or indirect connection with soiled material" (Rachman 2004). Mental pollution is a state triggered primarily by mental events; it is induced through thought, visual imagery, event(s) or by memory (as opposed to existing on an identifiable site such as the hand or face). A moral or normative component has also been noted as a feature specific to mental pollution. An experience of moral violation, such as betrayal, may evoke feelings of mental contamination (Rachman, 2010). This perceived sense of morality often results in the individual associating their sense of internal dirtiness with a negative personality or

characteristic trait. Therefore, it is not surprising that in light of the cognitive features of mental contamination, cleansing rituals do not ameliorate the felt sense of dirtiness.

To help clinicians more easily assess and distinguish mental pollution from related contamination fears, the following diagnostic criteria were set by Fairbrother, Newth & Rachman (2005) as:

1. The person experiences feelings of dirtiness that:
 - 1.1. Are evoked with or without physical contact with solid substance/material/person and,
 - 1.2. Persist in the absence of or independently of physical contact with soiled substance/material/person.
2. The feelings of dirtiness can be evoked or revived by memories, repugnant thoughts and/or images.
3. The feelings of dirtiness are not properly responsive to cleaning.
4. The feelings of dirtiness are accompanied by negative emotions (e.g. distress, anxiety, revulsion, disgust, shame and guilt).
5. Feelings of mental pollution are often accompanied by one or more of the following:
 - 5.1. A strong urge to clean.
 - 5.2. Attempts at alleviation are often unsuccessful.
 - 5.3. Attempts at avoidance are often unsuccessful.

- 5.4 Can be evoked or revived by information, criticism, and/or transgressions.
- 5.5 The bodily location(s) are not readily identifiable.
- 5.6 Affected persons may be unable to identify a triggering source, event or even circumstance.

Indices

When considering mental contamination, two key indices were proposed by Rachman (2004) to represent it: feelings of internal dirtiness and the urge to wash. With the development of a new self-report measure – the Mental Contamination Report (MCR; Elliott & Radomsky, 2009, 2012), two additional indices of internal negative emotions (such as shame, humiliation and sadness) and external negative emotions (such as anger, anxiety and disgust) were included.

Terminology

The terms mental contamination and mental pollution are used within the research interchangeably and appear to have a strong degree of synonymy. Mental pollution, defined as “an internal, emotional feeling of dirtiness that can arise without physical contact with a contaminant” (Rachman, 2004) sits alongside the term mental contamination which is defined as “any contamination that arises without physical contact with a contaminant” (Herba & Rachman, 2007). Herba & Rachman (2007) suggest mental pollution is a particular subtype of mental contamination. However, no specific parameters are set around the use of either term. Instead, it would appear that the use of the terms is dictated by the psychometric measure utilised within the

research. For instance, Herba & Rachman (2007) assess the construct using the Mental Contamination Report (MCR) and therefore use the term mental contamination throughout the paper. The Mental Pollution Interview (MPI) was used by Fairbrother & Rachman (2004) and thus the term mental pollution is used throughout. It is important to note that both measures assess the participant's feelings of internal dirtiness, urge to wash, and washing behaviour if present.

In light of this, the focus of the present review includes both terms as used by the relevant authors in the investigation.

Aims

The current review aimed to systematically identify and appraise research investigating the association between psychopathology and mental contamination (or mental pollution). In addition to this, the review sought to clarify whether the presence of mental contamination (or mental pollution) leads to the development and maintenance of psychopathology.

2. Method

A systematic literature search was administered using the following method:

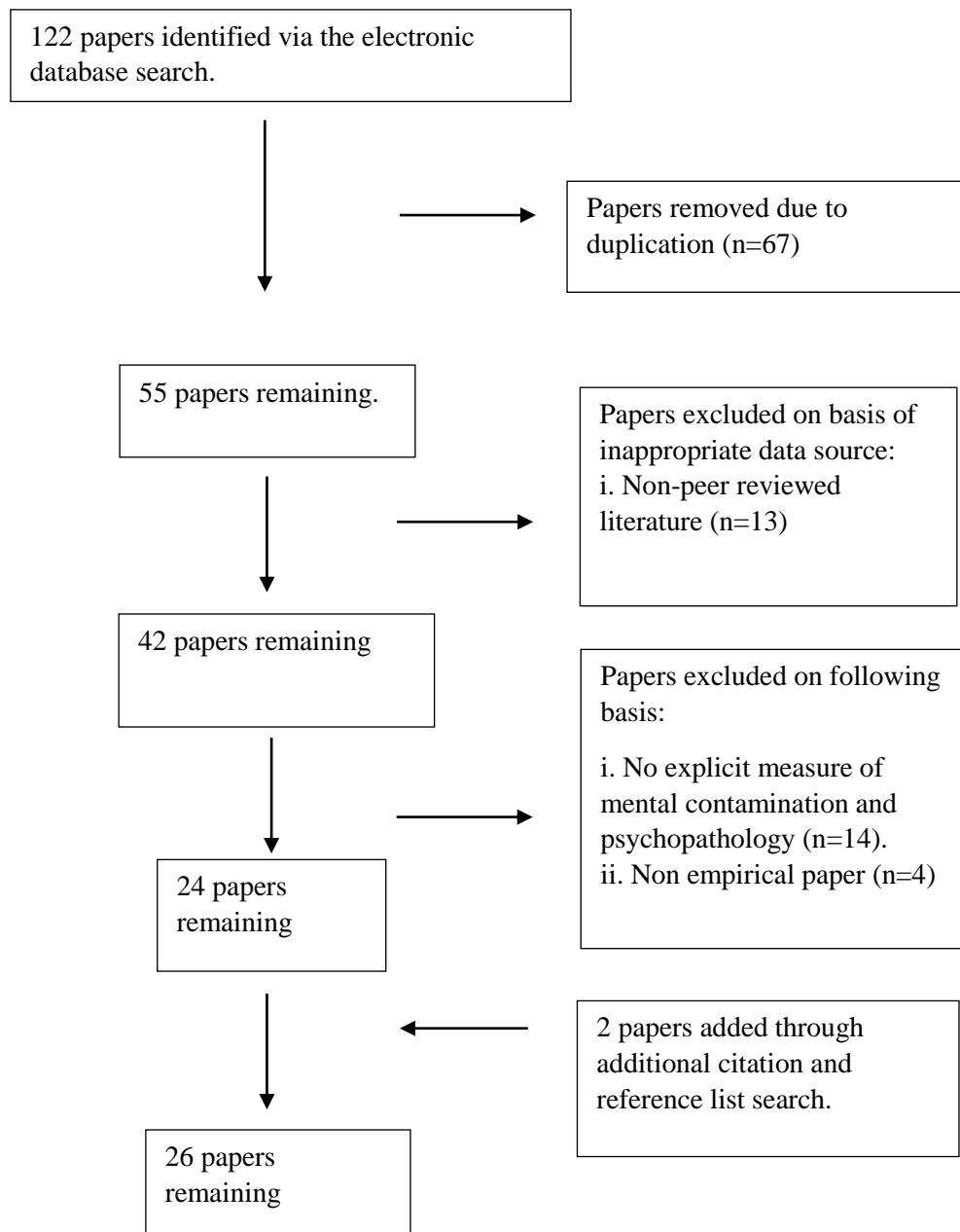
The following electronic databases were used to source the relevant papers; PsychINFO, MEDLINE and EMBASE. The latter is a comprehensive literature database of information relevant to biomedical research. MEDLINE provides literature on biomedical and life sciences and PsychINFO is a literature database of behavioural and social sciences. Search terms used were “mental contamination” OR “mental pollution”. Limitations placed on the search were as follows: (i) English language (ii) from 1980 to present, (iii) Peer reviewed journal and (iv) Human studies. Minimum limitations were placed on the search as not to overlook any published literature. Further literature was searched for by reviewing the reference lists of the final search results and by forward citation search. The eligibility for additional literature was set with the same criteria as the initial search.

The initial search resulted in 122 studies which was reduced to 55 once duplicates and unsuitable results were removed. Following the removal of duplicates, journal titles and abstracts were screened to remove papers deemed irrelevant to the study. The exclusion criteria at this stage was as follows:

1. Irrelevant to the measurement of mental contamination/pollution in an adult population.
2. Measurement of contact contamination fears only.
3. No systematic measure of mental contamination/pollution.
4. No reference to the relationship between psychopathology and mental contamination. A preferred reporting items for systematic reviews and meta-analyses

diagram (PRISMA; Moher, Liberati, Tetzlaff et al. 2009) - see Figure 1 - provides a summary of this process.

Figure 1: PRISMA diagram of search procedure.



Quality Appraisal

Following the systematic search, a review of each paper was completed to ascertain the quality of the paper. QualSyst (Kmet, Lee & Cook, 2004) was the selected quality appraisal tool given its ability to guide a thorough review as to whether a quantitative paper sufficiently describes its objective, implements an appropriate design and methodology alongside the detailing of results that support the conclusions drawn by the authors. More specific factors such as a definition of outcome measures, an appropriate sample size, justified analytic methods, the reporting of estimates of variances alongside controlling for confounding variables are also assessed by the tool. The assessment criteria for qualitative papers evaluates whether the objective and design of the study is clear and appropriate. Qualsyst also assesses whether the qualitative paper is connected to a theoretical framework, implements a systematic data collection and analysis procedure, uses verification and reflexivity with the results drawn and draws conclusions supported by said results.

In addition to this, QualSyst also incorporates inter-rater reliability into the appraisal process bolstering the reliability of the appraisal results. The QualSyst analysis involved the use of a checklist for quantitative and qualitative studies. The validity and reliability of each study was rated over fourteen items in the case of quantitative research and ten items for qualitative studies. Each item received a score of zero if it does not meet the item criteria, a score of one was given if the criteria was partially met and a score of two if the criteria was fully met. An additional scoring option of N/A (not applicable) was present for five criteria items assessing study design within the quantitative assessment tool.

Where relevant to a study, inapplicable items would be excluded from the calculation of the total score. Total scores for both assessment tools were calculated

by summing the total score obtained from all relevant items and then dividing this sum by the maximum total score possible. Thus the maximum score for a quantitative or qualitative study could range from zero to one, one representing an exceptionally high quality study and zero representing a study of poor quality. Three items were removed from the quantitative appraisal tool as the criteria were not deemed to be relevant to the studies in question (see Table 1).

Table 1: Excluded QualSyst quality appraisal items

Items Excluded from QualSyst quality appraisal	Reason for exclusion
Item 5: If interventional and random allocation was possible, was it described?	None of the studies were interventional nor was random allocation necessary.
Item 6: If interventional and blinding of investigators was possible, was it reported?	None of the studies were interventional nor was the blinding of investigators necessary.
Item 7: If interventional and blinding of subjects was possible, was it reported?	None of the studies were interventional nor was the blinding of subjects relevant to the study aims.

3. Results

Each paper was appraised under the conditions outlined. A summary of the quality appraisal summary score can be seen in Appendix 2a for the qualitative and quantitative studies.

Appendix A2 provides the overall quality summary scores for each paper given by the author (rater 1) and rater 2. Rater 2 was an independent rater who scored twelve randomly selected papers. Both raters scored one paper with the same appraisal summary score. The remaining studies had discrepancies ranging from 0.04 to 0.22. Items where discrepancies arose were discussed, the raters reviewed the relevant literature and Quallsyst checklist to verify the scores given. The ratings were analysed and were found to not be significantly difference despite of the score discrepancies ($t=-0.50$, $df=11$, $p=0.63$).

A minimum threshold value for the inclusion of the studies was introduced to determine which papers to include in the present review. Kmet, Lee & Cook (2004) suggest a minimum inclusion threshold value of 0.75 to be 'relatively conservative' whilst a value of 0.55 in comparison is 'relatively liberal'. For this review, the threshold was set at 0.60 to ensure that the literature included is of a good standard as a minimum. On the basis of a low quality score, the paper by Fergus (2014) was rejected from the review. It was given a quality score of 0.59 by the first rater and a score of 0.50 by the second rater. Following a discussion of the rating discrepancy, it was agreed that the moderate quality score assigned by rater 1 and poor quality score assigned by rater two justified rejecting the paper from the review.

Generally speaking, the twenty-five studies included in this review were of a good - high quality standard. Each paper's strengths and limitations will be considered in the review.

Psychopathology and Mental Contamination: A systematic evaluation of the literature.

i. OCD

Eight papers established a link between mental contamination and OCD psychopathology (Coughtrey, Shafran & Rachman, 2015; Coughtrey, Shafran & Rachman, 2013; Coughtrey, Shafran & Lee, 2012; Coughtrey, Shafran, Knibbs et al, 2012; Cogle, Lee, Horowitz et al, 2008; Herba & Rachman, 2007; Lee, Shafran, Burgess et al. 2013; Melli, Bulli & Carraresi et al, 2014;).

A high quality study (scoring 0.86) conducted by Cogle, Lee, Horowitz et al. (2008) aimed to validate the mental pollution questionnaire (MPQ). The study scored highly as the authors had controlled for confounding variables (general distress, trait guilt, and disgust sensitivity), used a moderate sized sample and utilised a mixed design of self-reports and clinical interview to obtain the data. The initial phase of the study focused on psychometric measure development using a large undergraduate university sample (n=208). Confirmatory factor analysis was then conducted on a second sample of undergraduate university students (n=257). This analysis unveiled a positive association between MPQ scores, thought-action fusion and inflated responsibility beliefs. These results provide empirical evidence to suggest that mental pollution is associated with beliefs and cognitive appraisals specific to OCD symptomatology.

Another high quality paper (scoring 0.81) focused on the variables that may lead to an increased vulnerability to experiences of mental contamination (Herba & Rachman, 2007). The study was conducted with female participants (n=100) who

had experienced sexual assault. Contact contamination fears and disgust sensitivity were found to be strongly associated with the key indices of mental contamination (urge to wash and feelings of dirtiness). Moreover, contact contamination fears were found to be a significant predictor across both mental contamination indices ($p < 0.01$). These results implicated contact contamination fears as a likely vulnerability factor for mental contamination. This is particularly relevant to the OCD population given that contact contamination fears are present in 50% of individuals with the diagnosis.

Coughtrey, Shafran, Knibbs et al. (2012) reported a significant relationship between the severity of OCD symptoms and mental contamination amongst a clinical sample ($n=177$). Further study into this relationship with a smaller clinical (OCD) sample ($n=54$) reported a positive correlation between depression and mental contamination, when general negative affect was controlled for the significant relationship between mental contamination and obsessive compulsive symptoms remained ($p < 0.005$; Coughtrey, Shafran, Knibbs et al, 2012). Though these results highlight the mediating effect of mental contamination on OCD symptomatology, it is worth noting that the study received a quality score of 0.77 due to a limited report on the estimates of variables within the data, limited controlling for confounding variables, and a small clinical sample size.

Melli, Bulli & Carraresi et al, 2014 received the same quality score (0.77) with a study that sought to analyse the role of mental contamination on the relationship between contamination related OCD and disgust propensity. The authors were able to confirm the findings of Coughtrey, Shafran, Knibbs et al. (2012) within a clinical sample and also controlled for depression and anxiety as confounding factors.

Limitations within the study such as a small sample size ($n=48$), the potential bias of

self-selecting participants, no controlling for the therapeutic treatments such as psychotropic or psychological therapy, and insufficient details of the participants characteristics led to the moderate quality score.

Qualitative research was conducted by Coughtrey, Shafran, Lee et al (2012) within a small sample of individuals with contamination-based OCD (n=20). This study also received a good quality score of 0.77 in spite of the limited disclosure on the iterative process and limited reflexivity within the methodology and conclusions drawn from the study. Mental contamination was a reported difficulty for all participants, once again associating the phenomenon within OCD psychopathology. The results also revealed that mental contamination can arise in the absence of a physical contaminant and spread quickly without direct contact. Self-contamination was also found to be possible through intrusive thoughts, images or memories. These results implicate features specific to OCD such as intrusive imagery, inflated responsibility and thought action fusion in the maintenance of mental contamination.

Three additional studies (Coughtrey, Shafran & Rachman, 2015; Coughtrey, Shafran & Rachman, 2013; Lee, Shafran, Burgess et al. 2013) gained lower quality scores of 0.73, 0.73 and 0.68 respectively. The relevance of imagery in mental contamination was highlighted by Coughtrey, Shafran & Rachman (2015) in a small sample study (n=15). The authors were able to assess through the use of a semi-structured interview that unwanted intrusive imagery evoked feelings of mental contamination.

OCD relevant psychopathology such as obsessionality was also implicated in the association between OCD and mental contamination in a study by Lee, Shafran, Burgess et al. (2013). Finally, Coughtrey, Shafran & Rachman (2013) explored the role of imagery in a small population (n=45) of individuals with OCD. Participants

reported feelings of mental contamination after completing a mental contamination imagery questionnaire (constructed by the authors). The lower quality score of 0.68 was the result of study limitations such as a small sample and the use of a non-validated questionnaire.

Contamination fears (both contact and indirect) are features noted within the psychopathology of OCD, the aforementioned studies suggest the means through which mental contamination may contribute to the manifestation of contamination fears and OCD symptomatology. Mental contamination was also found to be associated with features of OCD such as intrusive imagery, thought action fusion and inflated responsibility. Unfortunately the absence of longitudinal studies, the wide spread use of student, predominantly female, samples and a dependence on self-report measures limit the scope of these findings.

ii. Post-Traumatic Stress Disorder (PTSD)

Researchers have also investigated the association between mental contamination and PTSD symptomatology.

The clinician administered PTSD scale (CAPS; Blake et al 2005) for the Diagnostic and Statistical Manual of Mental Disorders (DSM IV; APA, 1994) was used by Adams, Badour, Cisler et al (2014) to measure the frequency and severity of PTSD symptoms. The researchers used a mixed sample of non-clinical participants who reported a history of either sexual or physical assault. As part of the inclusion criteria the reported assault was included in the study if it met Criterion A of the PTSD

diagnosis set within the American Psychiatric Association (APA, 1994). The authors were able to replicate the relationship between PTSD symptoms and contamination fears ($p < .05$) as measured by the Vancouver Obsessive Compulsive Inventory- Mental Contamination (VOCI-MC, Rachman, 2006) and the Vancouver Obsessive Compulsive Inventory (VOCI, Thordarson, Radomsky, Rachman et al, 2005).

Further analysis revealed that this interaction was specific to victims of sexual assault. The presence of mental contamination was found to be responsible for 51% of the total variance in PTSD symptomatology. Conversely, analysis of the same variables within the victims of physical assault produced weak and non-significant interactions ($p = 0.07$). This marked difference between physical and sexual assault victims may be explained by the heightened emotional arousal and contamination aversion known to be activated during incidents of sexual assault as well as the potential for sexual assault to evoke cognitions related to morality. The study achieved a high quality score of 0.86. The objective and design of the study was clear and appropriate and the study outcome measures were well defined and validated. Moreover, the results were reported in detail with estimates of variance and supported the presented conclusions. That notwithstanding, there are notable limitations such as the absence of a large clinical population and the limited inclusion of confounding variables (such as other mental health diagnoses and time since the assault).

Another study of high quality (scoring 0.81) also investigated the association between PTSD symptomatology and mental contamination (Olatunji, Elwood, Williams et al. 2008). Mental pollution was assessed via the mental pollution questionnaire (MPQ, Cougle, Lee, Horowitz et al, 2008) and sexual assault and rape

appraisal self-report questionnaire (SARA, Fairbrother & Rachman, 2014). Higher levels of mental pollution were associated with post-traumatic stress symptoms (PTSS), PTSS were measured through the Purdue PTSD scale-revised (Lauterbach & Vrana, 1996) and the posttraumatic cognitions inventory (Foa et al, 1999). Mental pollution accounted for 16% of the variance in post-traumatic stress symptoms ($p < 0.05$). With further data analysis the researchers established that the interaction between mental pollution and PTSD symptoms was mediated by the presence of PTSD cognitions. Once PTSD cognitions were controlled for the predictive value of mental pollution reduced substantially from a β value of 0.40 to 0.14.

It is possible therefore that this necessary appraisal of the event as a trauma may lead to secondary inferences about its impact on the individual. The meaning that the individual places on the trauma may give rise to a sense of feeling internally dirty or contaminated by the perpetrator. The small sample size ($n=48$) within this study, basic reporting of subject baseline characteristics (for instance time since sexual assault occurred or history of therapeutic support post assault were not reported), and the recruitment of the participants from an existing study are noticeable limitations to the generalisability of these findings.

The role of trauma had also been assessed by Berman, Wheaton, Fabricant et al (2012), although the growing literature has focused on victims of sexual assault, the aforementioned authors investigated the association of mental pollution within childhood trauma experiences. The Childhood Trauma Questionnaire- short form (CTQ) (Berstein, Fink, Handlesman et al 2003) was used to assess childhood trauma. It is a 28 item 5 point Likert style self-report questionnaire. Participants retrospectively report the occurrence of five subscales of child maltreatment (emotional neglect, emotional abuse, physical neglect, physical abuse and sexual

abuse). The MPQ (Cougles, Lee, Horowitz et al, 2008) was used to measure the occurrence of mental pollution. Zero order correlations between the variables identified a positive association between childhood trauma and both subscales of mental pollution (feelings of internal contamination and washing rituals). Interestingly, the subscale of physical neglect did not have a significant association with feelings of internal contamination (these findings appear to replicate the results reported by Adams, Badour, Cisler et al, 2014). The remaining subscales of childhood trauma positively predicted internal feelings of pollution to a highly significant level ($p < 0.001$). This study achieved a high quality score of 0.81 however it is likely that the study limitations (nonclinical sample, the dependence on participant's ability to recall autobiographical events accurately without any additional assessment of memory recall and correlational design) may have resulted in the muted predictive power between childhood trauma and mental pollution. Given the focus of this paper was on childhood trauma, it is important to note the potential potency and persistence of mental pollution once it is activated. Additional research reinforces the suggestion that mental contamination is persistent once evoked in an individual (Coughtrey, Shafran & Rachman, 2014).

The remaining studies were of a lower, but still good, quality (0.73) due to methodological limitations such as limited reports of estimates of variance and small samples. That notwithstanding, the research suggests that internal and emotional feelings of dirtiness post-trauma lead to the manifestation of mental pollution in female victims (Fairbrother & Rachman (2004). Similarly, difficulty tolerating negative emotions and intrusions post assault were also thought to be mechanisms through which trauma and mental contamination are associated (Fergus & Bardeen, 2015).

There are a growing number of studies investigating the association between mental contamination/pollution and PTSD symptomatology. The studies discussed so far have identified trauma to be a significant predictor of mental contamination/pollution within the ranges of 16 - 51% (Adams, Badour, Cisler et al, 2014; Cogle, Lee, Horowitz et al, 2008; Olatunji, Elwood, Williams et al. 2008). It is predominantly in the context of sexual trauma that this relationship has been noted. Physical assault, even when it has been verified as an incident of trauma by the criterion for PTSD as set American Psychiatric Association (APA, 1994), has not been found to evoke the same experience of mental contamination/pollution. Disgust has been implicated as a variable that may explain the relationship between mental pollution/contamination and sexual trauma.

iii. Disgust

Disgust is a construct that has been shown to be associated with psychopathology, more specifically it has been implicated in the development and maintenance of anxiety based psychopathologies such as phobias, eating difficulties and OCD (cf. Davey & Bond, 2006; Olatunji, Cisler, McKay et al. 2010).

There are two specific domains of disgust: disgust sensitivity, defined as “the perceived harmful consequences of experiencing disgust” (cf. Olatunji, Cisler, Deacon et al 2007) and disgust propensity “the ease with which an individual may experience feelings of disgust”.

Four papers were found to report an association between disgust and mental contamination. Research conducted by Carraresi, Bulli, Melli et al. (2013) assessed

experiences of mental contamination and disgust propensity through the VOCI- MC (Rachman, 2006) and the Disgust Propensity Questionnaire (DPQ; Melli, Chiorri, Bulli et al. 2012) within a sample of patients diagnosed with OCD (n=83). Significant correlations were identified between mental contamination and disgust propensity ($p<0.01$). Mediation analysis revealed that mental contamination partially mediates the relationship between disgust propensity and contamination fears. This particular study received the highest rating amongst all of the papers reviewed (0.95). The noted strengths of the study was the use of validated questionnaires in a counter balanced order. The clinical sample was sourced through appropriate means. In addition to this, the correlational design of the study was an appropriate methodology and the conclusions discussed supported the results reported.

The second highest quality rating (0.91) for a paper was written by Badour, Feldner, Blumenthal et al. (2013). The authors sought to examine the relationship between sexual trauma, mental contamination and feelings of disgust sensitivity. The Clinician administered PTSD Scale (CAPS) (Blake et al, 1995) was used to measure symptoms of PTSD, the presence of mental contamination was measured using the SARA (Fairbrother & Rachman, 2004), and disgust sensitivity was measured by the 16 item self-report measure Disgust Propensity and Sensitivity Scale- revised (DPSS-R, Van Overveld, Jong, Peters et al 2006). The authors established a positive association between both mental contamination and disgust sensitivity with posttraumatic stress symptoms severity ($p<0.001$). The authors suggest that the internalisation of disgust following an assault may lead to the manifestation of mental contamination. Limitations within the study were noticeable despite the high

score such as the cross sectional design and the use of a small community sample (n= 38).

A larger sample study (n=478) conducted by Travis & Fergus (2015) established the potentiating effect of disgust sensitivity on the relationship between mental contamination and disgust propensity. The DPSS-R (Van Overveld, Jong, Peters et al 2006) was used to measure disgust and the VOCI-MC (Rachman, 2006) was used to assess mental contamination. This study received a quality score of 0.77. The authors used validated self-report measures whilst controlling for covariates such as negative affect in order to identify a relationship between both indices of disgust and mental contamination. The research proposes that disgust propensity may hold a stronger association with mental contamination whilst disgust sensitivity is thought to act as a potentiating, but not necessary, factor in this relationship. Given disgust propensity represents the ease with which an individual experiences disgust, it seems likely that this construct would be strongly related to mental contamination. Whilst Travis & Fergus (2015) were able to isolate this unique interaction, the study is not without limitations. For instance, the study is internet based meaning the source of the non-clinical sample may not represent the community. Similarly, the authors did not screen for potential mediating factors such as pre-existing mental health conditions and the report of estimates of variances was particularly limited.

Research was conducted by Badour, Ojserkis, Mckey et al. (2014) within a moderate sized sample (n= 72) of females who had experienced sexual assault. The DPSS-R (Van Overveld, Jong, Peters et al 2006) and the VOCI-MC (Rachman, 2006) were used to assess disgust and mental contamination respectively. The investigation revealed an association between peri-traumatic self-focused disgust and mental contamination ($p < 0.001$). Conversely, peritraumatic perpetrator focused

disgust was not significantly associated with mental contamination. These results serve to demonstrate how an internal sense of disgust following sexual assault can manifest into mental contamination. It is worth noting that this study received a moderate appraisal score of 0.73 due to methodological limitations such as limited confounding variables in the analysis and an unclear screening protocol for participants.

Mental contamination encapsulates a sense of internal uncleanliness and an urge to wash. As demonstrated through the discussed literature, it is possible that internalised feelings of disgust (experienced through sexual assault or trauma) can reinforce a felt sense of internal dirtiness. As this sense of disgust and internal dirtiness escalate, maladaptive coping strategies may develop (such as an urge to wash) resulting in the maintenance of mental contamination.

iv. Cognitive Appraisals

Understanding the role of cognitive processes within mental health disorders is an important step towards ascertaining the aetiology and treatment implications for the condition in question. For instance, cognitive processes such as rumination and attention biases were linked to the maintenance and development of depression (Joorman & Quinn, 2014). Similarly, Butler & Mathews (1983) first proposed cognitive biases were an important feature in anxiety when considering threat appraisals.

A growing body of research has begun to focus on the cognitive processes that may be associated with mental contamination. These studies allow for a better

understanding of how mental contamination may maintain, or lead to, the development of mental health psychopathology through cognitive processes.

High quality research conducted by Elliott & Radomsky (2013), scoring 0.86, replicated some of the interactions between mental contamination indices and appraisals of personal responsibility, perceived violation and post kiss perceptions of dirtiness. The authors conducted the 'dirty kiss paradigm' (Elliott & Radomsky, 2009) through the content of the audio recording to represent a non-consensual kiss from a man described as physically dirty or immoral in character. Significant and unique variances were identified amongst the indices of mental contamination and the aforementioned appraisals; appraisals of personal responsibility were found to be predictive of internal negative emotions (i.e. shame, humiliation, sadness and feeling afraid) ($p < 0.01$). Appraisals of violation were predictive of external negative emotions (i.e. anxious, anger and disgust) ($p < 0.01$) whilst post kiss perceptions were predictive of feelings of dirtiness and external negative emotions ($p < 0.05$, $p < 0.01$ respectively).

These findings served as an extension of previous research conducted by the authors to investigate the impact of perceived morality on mental contamination feelings (Elliott & Radomsky, 2012). This study was also of a high quality (scoring 0.81) despite being limited by the use of a student population and limited reports on estimates of variance. Significant positive associations were reported between perceived immoral behaviour and feelings of mental contamination as measured by the MCR (Elliott & Radomsky, 2009, 2012).

Waller & Boschen (2015) also reviewed the perception of morality through imaginal tasks. This study received a quality score of 0.77 due to limitations such as

the homogenous participant sample (female students) and limited control for confounding variables. That notwithstanding, the authors identified that the perception of immorality amongst participants evoking feelings of mental contamination ($p < 0.001$).

Radomsky & Elliott (2009) analysed the individual appraisals present in mental contamination through the 'dirty kiss paradigm'. The study was rated to be of good quality (0.77). The authors assessed appraisal variables using the MCR (Elliott & Radomsky, 2009, 2012), participants were asked to rate on a scale of 0 (not at all) to 100 (completely) the extent to which they experienced personal responsibility associated with the kiss occurring, their perception of violation as they experienced the kiss and finally, the perceptions of morality of the (male) perpetrator of the kiss. Statistical analysis revealed a weak to moderate correlation between ratings of personal responsibility and mental contamination indices of feelings of dirtiness, urges to wash and internal negative emotions ($p < 0.01$) – the trend was strongest for the latter ($r = 0.55$). Appraisals of violation and post kiss perceptions (within the immorality condition) were also found to be associated with all four indices of mental contamination ($p < 0.01$).

Thought action fusion appraisals were also implicated in the manifestation of mental contamination. A previously discussed study conducted by Coughtrey, Shafran, Knibs et al. (2012) reported a significant relationship between thought action fusion traits, a predominant feature within OCD, and mental contamination. Mental contamination was found to have a mediating effect of OCD symptomatology ($p < 0.005$).

Additional research conducted by Fairbrother, Newth & Rachman (2005), Elliott & Radomsky (2009), Rachman, Radomsky, Elliott et al. (2012) received quality scores of 0.73 for preliminary investigations with student samples. The study conducted by Rachman, Elliott, Radomsky et al. (2012) is particularly noteworthy as the authors captured mental contamination as experienced by the perpetrator of an imagined immoral event. The authors incorporated an additional element of betrayal into the imagined scenario as a means to magnify the sense of immorality. This led to increased levels of anxiety, disgust, feelings of dirtiness and urges to wash ($p < 0.001$).

Ishikawa, Kobori & Shimizu (2015) extended the investigation of cognitive appraisals to include perceptions of violation and responsibility within a small sample of females who had experienced sexual assault. The researchers reported a significant relationship between feelings of dirtiness and appraisals of violation and responsibility. Interestingly the same relationship was not established with urges to wash. Similarly, only the perception of immorality was found to be associated with internal and external negative emotions (such as depression and anxiety). Although these findings in part replicate the results reported by Cougle, Lee & Horowitz, 2008 and Elliott & Radomsky (2009), it is possible that the limitations of the study (namely a small student sample, no control for variables such as time since sexual assault and no reports of standard error values) led to the inconsistent findings and considerably lower quality score of 0.64.

These studies explore the role of cognitive appraisals within mental contamination. Although the research is undeniably pioneering, it is not without limitations, the use of a small female student sample in many cases limits the generalisability of the results. In some studies, there is no measure to assess for a

history of sexual assault– a potential history will likely confound the participants response to the dirty kiss paradigm- and the assessment of cleaning rituals does not assess for internal cleaning rituals (such as neutralising rituals prominent within OCD). Finally, the majority of the studies rely on the participants' ability to be simultaneously aware of their appraisals of the dirty kiss paradigm and their experiences of mental contamination, this makes the methodology in the majority of papers vulnerable to participant misinterpretation.

Summary of the mental contamination across psychopathologies.

The studies within this review implicated mental contamination in the development and maintenance of specific psychopathologies. Positive trends were noted between mental contamination (or mental pollution) and either OCD or PTSD symptomatology (Adams, Badour & Cisler et al, 2014; Berman, Wheaton, Fabricant et al, 2012; Coughtrey, Shafran, Knibbs et al, 2012; Cogle, Lee, Horowitz et al, 2008; Fergus, 2014; Herba & Rachman, 2007; Melli, Bulli & Carraresi et al, 2014; Olatunji, Elwood, Williams et al, 2008). Similar trends were also noted with cognitive biases and experiences of disgust. This finding is somewhat unsurprising given that both these variables can be present within the symptomatology of PTSD and OCD. In the case of PTSD, the association between mental contamination and PTSD was specific to victims of sexual trauma. As yet no research has unearthed a similar relationship between physical trauma and mental contamination. It is possible that contamination fears must be present in order for mental contamination to demonstrate a strong enough interaction with psychopathology features. Contamination fears may be more likely to feature within incidents of sexual trauma

given the victim is exposed to many potential contaminants from the perpetrator during the assault.

Amongst the reviewed research, PTSD-related cognitions were specifically implicated as a mediator between the experience of mental contamination and PTSD symptoms (cf. Olatunji, Elwood, Williams et al, 2008). It is possible that as an individual attempts to process the traumatic event, a felt sense of being internally contaminated (mental contamination) increases the individual's sense of threat. This in turn may disrupt the individual's ability to cognitively process the trauma resulting in the development of PTSD.

4. **Discussion**

The current literature review sought to establish the role of mental contamination (or mental pollution) within psychopathology. Following a systematic search, twenty-five studies were subject to dual rated quality appraisal process and deemed to be of a good to high standard. A review of the literature suggests that mental contamination may contribute to the manifestation of OCD and PTSD symptomatology. Further to this, mental contamination was also found to be associated with disgust and cognitive biases, two key features implicated in the development of various mental health disorders.

The empirical evidence implicates a relationship specifically between Anxiety or Trauma – and Stressor-Related Disorders and mental contamination. As such, a transdiagnostic approach was adopted to conceptualise the mechanisms that may facilitate this interaction. The resulting model suggests that the characteristics and cognitive appraisals of the triggering event may lead to the manifestation of mental contamination and concurrent psychopathology. Research conducted by Olatunji, Elwood, Williams et al. (2008) and Rachman (2010) support these findings. The researchers suggest that morality (either in the form of relational betrayal or sexual assault) is an important cognitive appraisal that may elicit a sense of internal dirtiness and subsequent mental contamination. Following this, further negative appraisals may likely lead to the development of Post-Traumatic Stress Disorder symptomatology. These findings can also be supported by Cogle, Lee, Horowitz et al. (2008), the researchers proposed that the beliefs linked with OCD (namely thought-action fusion and inflated responsibility) may be responsible for the association between mental pollution and OCD symptomatology.

Though the transdiagnostic approach appeared to successfully conceptualise the association between psychopathology and mental contamination, one must consider that the characteristics attributed to the presence of mental contamination may well reflect comorbidity between OCD and PTSD (Brown, Campbell, Lehman et al. 2001; Slade & Andrews, 2001). Research suggests that trauma stemming from direct contact with elements that evoke disgust may well be a unique subtype of OCD (Sasson, Dekel, Nacasch et al. 2005). In which case, the contamination fears and urge to wash may be more indicative of a subtype of OCD symptomatology and not, mental contamination. There are however notable limitations to be mindful of, namely that the research into this subtype of OCD is limited to case reports and empirical data is often inconsistent (Huppert, Moser, Gershuny et al. 2005). Furthermore, the comorbidity between OCD and PTSD was found to be attributed to a high co-occurrence with depression (Huppert, Moser, Gershuny et al. 2005). In contrast, mental contamination was still found to be related to psychopathology after controlling for depression in a large proportion of the literature reviewed (Adams, Badour, Cisler et al. 2014; Badour, Feldner, Blumenthal et al. 2013; Cogle, Lee, Horowitz et al. 2008; Herba & Rachman, 2007; Olatunji, Elwood, Williams et al. 2008; Radomsky & Elliott, 2013;). These findings suggest that whilst there are undeniably some shared characteristics between OCD & PTSD, there are also additional pathological features to consider, such as mental contamination, which may serve to explain the relationship.

A preliminary conceptualisation

This review has demonstrated how mental contamination features across psychopathology.

These findings support a transdiagnostic model whereby psychopathology characterised by a sense of violation or threat is associated with experiences of mental contamination. There has been a noticeable shift towards a transdiagnostic approach for the treatment of mood disorders. Whilst it is not within the scope of this review to provide a detailed analysis into burgeoning transdiagnostic approaches, it is worth noting the wealth of literature that has been found to demonstrate the equivalent efficacy of transdiagnostic treatment compared to diagnostic specific interventions (cf. Dear, Staples, Terides et al., 2015).

Shared risk factors within anxiety and Trauma - and Stressor- Related disorders

Negative life events (such as childhood abuse), experiences of behavioural inhibition and upbringing have been implicated as the general risk factors across anxiety disorders (Michael & Margraf, 2004). A history of exposure to stress or trauma (particularly at a young age), social isolation and a history of behavioural or psychological disorder are shared risk factors for the development of either OCD or PTSD. The preliminary model proposes that the characteristics of the triggering event influence which disorder may be more likely to occur. For instance, should the event involve a high level of threat to life or serious injury it may be more likely that symptoms of PTSD will manifest given that exposure to a traumatic event is part of the diagnostic criteria for PTSD (APA, 2013). Of course, individual differences such as emotional resilience, past psychiatric history and the presence of negative

cognitions are also mediating factors into the severity of the developed disorder.

As discussed, shared characteristics were evident between OCD and PTSD. This is despite recent revisions within the DSM V (APA, 2013) to reclassify PTSD under Trauma - and Stressor-Related Disorders. The expansion of the diagnostic criteria of PTSD to include a cluster of persistent negative changes in both cognition and mood also maintains a degree of homogeneity between the two disorders.

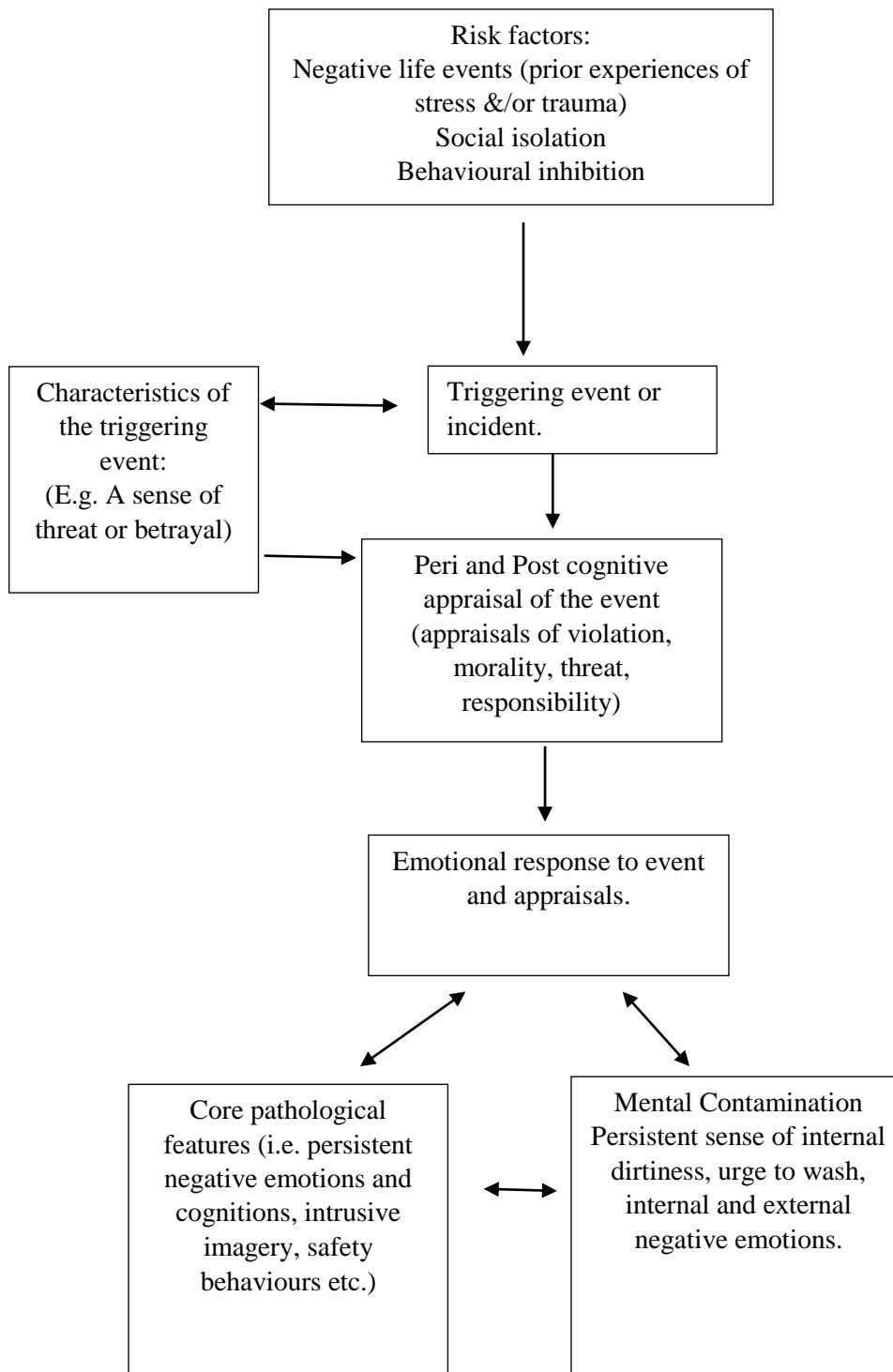
Bidirectional interaction between mental contamination and psychopathology

The preliminary conceptualisation of the results suggest a bidirectional interaction between psychopathology and mental contamination following a triggering event (as illustrated in Figure 2). It is possible that characteristics of a triggering event (i.e. sexual assault or contamination risk) may evoke appraisals specific to mental contamination such as the individual developing urges to wash, experiencing feelings of internal dirtiness, or overwhelming feelings of shame, anger or disgust. Equally, event appraisals such as appraisals of violation, perceived responsibility and morality are implicated in the development of PTSD or OCD symptomatology and mental contamination/ pollution.

Should the triggering event initially lead to OCD or PTSD symptomatology this could facilitate the development of mental contamination. Peri-traumatic cognitions and contact contamination fears are noted features of PTSD and OCD (respectively) that have been implicated as predictors of mental contamination (Adams, Badour & Cisler et al, 2014; ; Berman, Wheaton, Fabricant et al, 2012; Coughtrey, Shafran, Knibbs et al, 2012; ; Cogle, Lee, Horowitz et al, 2008; Fergus, 2014; Herba &

Rachman, 2007 Melli, Bulli & Carraresi et al, 2014; Olatunji, Elwood, Williams et al, 2008).

Figure 2. A preliminary model of mental contamination and psychopathology



Limitations

Multiple methodological limitations are worth noting within the current literature. There is a lack of representative sampling within the studies which limits the generalisability of the findings. A large proportion of the studies draw from female, student populations, the majority of which originate from Europe or North America. The small sample sizes in a proportion of the papers also reduce the reliability of the findings.

One must also be mindful of the validity and reliability of the self-report measures used to determine the presence of mental contamination. Measures such as the MCR, MCIQ and USES -Herba & Rachman (2007); Coughtrey, Rachman & Shafran (2013); Fairbrother, Newth & Rachman (2005) respectively- are yet to be validated as psychometric measures.

Limitations within the current review are also important to note. The review has integrated and made direct comparisons of multiple study results despite a variation in the methodology and interventions used by the researchers. Similarly, there is variation between the outcome measures used to ascertain the presence of mental contamination or mental pollution. This had been acknowledged prior to conducting the current review, however this does not negate the possibility of inconsistencies across the studies given the different measures of mental contamination. For instance, the mental pollution questionnaire (MPQ; Coughle, Lee, Horowitz et al, 2008) is based on defining criteria set as an internal sense of dirtiness and an urge to wash (Rachman, 2004). This contrasts with the Mental Contamination Imagery Questionnaire (MCIQ; Coughtrey, Rachman, Shafran, 2013) which assesses specifically for mental contamination imagery and associated levels of distress.

Another notable limitation is that the majority of studies within this review are of a cross-sectional design, thus causal relationships cannot be drawn. This means that the results of this review were not able to reflect the predictive nature of the relationship between mental contamination and psychopathology. Instead, the review is only able to conclude that there was a significant association noted between the two variables. Future research could focus on replicating the current findings and assessing for causation amongst the variables.

It is also possible that in spite of the systematic literature search, relevant research may have been missed due to human error and the implementation of specific inclusion/exclusion criteria (such as restricting the search to adult populations and papers written in English). It is also possible that relevant literature may have been in press at the time of the search however it is not possible to anticipate, or foresee relevant publications that are awaiting peer review. A final limitation to consider is that the rejection of the paper investigating the association of scrupulosity and mental contamination (Fergus, 2014) may have resulted in the omission of relevant and interesting data.

Clinical Implications

The relationship between mental contamination and psychopathology has important clinical implications. It is possible that a mental contamination screening tool (based on the defining criteria set by Fairbrother, Newth & Rachman, 2005) could facilitate a more effective treatment plan for patients. As previously discussed, this would be particularly relevant in instances where ERP has had a limited effect

on clinical recovery. Clinicians could consider alternative therapeutic interventions focused on cognitive restructuring of the negative appraisals relating to the triggering event and distress tolerance skills to ameliorate the felt sense of internal dirtiness.

Adult populations diagnosed with disorders other than PTSD or OCD may also benefit from screening for features of mental contamination. For instance, Generalised Anxiety Disorder (GAD) is characterised by negative meta-beliefs during which worry is experienced as threatening and intrusive (Wells, 1997). This feature of threat and intrusive cognitions is present in OCD and PTSD and may indicate an association between GAD psychopathology and mental contamination. Similarly, research conducted by Rachman, Radomsky, Elliott et al. (2012) reported an association between betrayal experiences and mental contamination. Betrayal experiences have been highlighted as an important feature within Personality Disorders, particularly Borderline Personality Disorder (Freyd, 1996; Kaehler & Freyd, 2009). Given this, it is possible that mental contamination may be relevant to this clinical population.

Future Research

Future research into mental contamination should take into account the need to utilise clinical populations, with representation of both genders in order to account for possible gender variation in terms of psychological, social and biological differences. Prospective, longitudinal studies are also required in order to make an adequate assessment of the development and maintenance of mental contamination within psychopathology over time. Further to this, future studies might be best served to use a more consistent method through which to assess for mental contamination.

Given that the findings implicate the relevance of mental contamination within OCD, replicating these findings and extending the research to consider the severity and subtypes of OCD (i.e. contamination, checking or hoarding) could prove to be of theoretical and clinical utility.

Conclusions

The current review provides support for an association between mental contamination and psychopathology, particularly in the case of Anxiety and Trauma - and Stressor-Related disorders. In spite of the noted limitations, the clinical relevance of these findings hold important implications for clinical assessment and treatment interventions. The findings from this review suggest a bidirectional relationship between psychopathology and mental contamination. Given this, it is also possible that mental contamination may well be a maintenance factor within specific psychopathology. Similarly, the symptomatology present in Anxiety or Trauma - and Stressor-Related Disorders could lead to an increased vulnerability to mental contamination. Advances within further research have been discussed and noted to be necessary in order to investigate the potential causality between mental contamination and psychopathology.

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Part 2: Empirical Paper

Betrayal Responses and Personality Pathology: The Development of the Betrayal Response Scale

Abstract

Aims

The aim of the study was to develop a psychometric scale to reliably assess for psychosocial impairment following an experience of betrayal trauma.

Method

434 participants from a community sample completed a series of self-report psychometric measures online of psychosocial impairment, betrayal trauma experiences and personality trait pathology.

Results

The Betrayal Response Scale (BRS) consisted of 20 items and two subscales related to internalised negative emotions and negative interpersonal responses. Higher BRS scores were associated with personality pathology, interpersonal impairment and poor social functioning.

Conclusion

The BRS is a reliable measure of psychosocial impairment following betrayal trauma. People with personality pathology report greater levels of psychosocial impairment following betrayal trauma. Potential uses of the BRS as a clinical and research instrument are discussed.

1. Introduction

A preliminary conceptualisation of the psychological significance of betrayal was proposed by Rachman (2010). The author defined betrayal as “A sense of being harmed by the intentional actions, or omissions, of a person who was assumed to be a trusted and loyal friend, relative, partner, colleague or companion”. In addition, Rachman (2010) developed a provisional framework to illustrate betrayal as an event that can have catastrophic effects on an individual. Common betrayal events were categorised into five types: infidelity, damaging disclosure of confidential information, disloyalty, dishonesty, and perceived failure to offer support in times of need. The responses evoked in the face of betrayal extend to anger, rumination, low self-esteem, doubt, punitive thoughts, and a sense of violation (Koehler & Gershoff, 2003; Rachman, 2010). Although there is a dearth of literature examining betrayal experiences within clinical populations, the author illustrates, through a series of case studies, how patients diagnosed with Obsessive Compulsive Disorder (OCD) demonstrated a marked cognitive preoccupation with an experienced betrayal event (Rachman, 2010). It was hypothesised that betrayal experiences may well exacerbate psychopathology.

Further lines of research illustrate the relevance of betrayal experiences and personality pathology. Research conducted by Kaehler & Freyd (2009) unveiled a positive correlation between betrayal trauma (as measured by the Brief Betrayal Trauma Survey; Goldberg & Freyd, 2006) and Borderline Personality Disorder (BPD) traits. Likewise, the Betrayal Trauma Theory (Freyd, 1996), serves as a significant framework to illustrate the relevance of betrayal experiences within the personality disorder population.

Betrayal Trauma Theory

The betrayal trauma theory (Freyd, 1996), implicated two important evolutionary systems in the regulation process following a betrayal event; Attachment and the cheater-detector. Freyd (1996) developed the term cheater-detector to encapsulate a system that facilitates one's survival by equipping the individual with the ability to detect betrayal within a relationship and avoid further betrayal within one's social group. The two systems can come into conflict when an attachment figure is the perpetrator of a betrayal event such as abuse, neglect or maltreatment (Freyd & Birrell, 2013). When such an event arises, betrayal trauma theory states that the need for survival through an attachment figure overrides the cheater-detector. As a child, the attachment figure holds the key to survival, thus a child trapped between the two conflicting systems is forced into a distinct cognitive response known as 'Betrayal Blindness' (Freyd, 1996). Here the child represses the traumatic event of betrayal to varying degrees as an adaptive response to maintain their relationship with their attachment figure despite remaining vulnerable to the negative emotional, psychological and social impact of abuse. Betrayal trauma theory suggests that early experiences of betrayal may lead to future interpersonal difficulties. This is because characteristics such as mistrust and limited cooperation develop in childhood as a result of betrayal and persist through to adulthood.

The conceptualisation of betrayal proposed by Freyd (1996) led to the development of a psychometric measure known as the Betrayal Trauma Inventory (BTI; Freyd & DePrince, 1997) and the Brief Betrayal-Trauma Survey (BBTS; Goldberg & Freyd, 2006). The BTI assesses for thirteen specific physical abuse behaviours and twenty

sexual abuse behaviours in a lengthy self-report questionnaire. The relationship between the abuse survivor and the perpetrator of the event(s) committed is also assessed within the BTI. Use of the measure has produced findings consistent with the Betrayal Blindness model (Freyd, 1996) such that participants reported less persistent memories of abuse perpetrated by their caregiver in comparison to abuse perpetrated by other individuals. The BBTS, in contrast, assesses only for the occurrence of betrayal events experienced by an individual before and after age 18 years old. The authors developed a measure that categorises betrayal incidents into 'high', 'medium' or 'low' events. The relational closeness of the individual to the perpetrator determines the category to which the betrayal event is assigned thus high incidents are those in which the perpetrator has a close relationship to the victim (i.e. family member). Medium incidents were those enacted by a perpetrator that the victim is not in a close relationship with (i.e. stranger or acquaintance) whilst low incidents were traumatic events which occur in the context of no interpersonal relationship (i.e. a natural disaster or road traffic accident). The BBTS has become a well-used measure within betrayal trauma research as it is a quick measure to screen for the presence of betrayal experiences. Betrayal experiences such as physical and sexual abuse are known risk factors for developing a personality disorder (Battle, Shea, Johnson et al. 2004).

Personality disorders

There are ten distinct types of personality disorder classified within the Diagnostic and Statistical Manual of Mental Disorders Vol 5 (DSM V; APA, 2013). Although each personality disorder is categorised by specific diagnostic characteristics, general diagnostic criteria exists across all personality disorder types. DSM 5 (APA, 2013) dictates that core features of "significant impairment to the self (either in the form of

self-identity or self-direction) and interpersonal (empathy or intimacy) functioning” (APA, 2013) must be present in an individual prior to ascribing a particular subtype of personality disorder. This diagnostic feature serves to emphasise a core pathological feature within personality disorders whereby the individual struggles to maintain a coherent self-identity and stable interpersonal relationships.

The aetiology of personality disorders

Established interpersonal theories such as attachment theory (Bowlby, 1969; 1988) are heavily implicated in the development of personality disorders. A developing child depends on their care-giver to be sensitive and appropriately respond to their needs in order to develop a secure attachment. Insecure attachment however is likely to form in the context of adverse childhood experiences such as abuse, maltreatment and neglect. These particular experiences are implicated as risk factors for developing a personality disorder- particularly BPD (Battle, Shea, Johnson et al. 2004; Agrawal, Gunderson, Holmes et al. 2004). Moreover, higher rates of insecure attachment have also been identified within Antisocial, Histrionic and Narcissistic personality disorders when compared to the general population (Cassidy & Shaver, 2008).

Linehan’s (1993) biosocial theory conceptualises the way in which the developing child’s environment paves the way to pathological personality traits. The biosocial theory (Linehan, 1993) conceptualises the transaction between an individual’s biological predisposition to emotional dysregulation and an invalidating environment, as a reinforcement of the problematic behaviours common within BPD symptomatology. Emotional dysregulation refers to one’s sensitivity and reactivity

to emotional stimuli in their environment. It is proposed that individuals with BPD have a heightened sensitivity to emotions. In addition to this, the response patterns possessed by the individual to help regulate their emotions are thought to be ineffective. As a consequence they are unable to return to a more tolerable, less intense emotional baseline when aroused. In an invalidating environment, the caregiver has an intolerance towards the expression of emotions by the child that are not in line with their own interpretation of events. Betrayal events such as abuse, maltreatment or neglect fit within the frame of invalidating experiences. These events reflect the psychological conceptualisation of betrayal (Rachman, 2010) due to the occurrence of disloyalty, dishonesty and failure to support the child in times of need.

Further research conducted by Crowell, Beauchaine & Linehan (2009) expanded on the original biosocial theory by subsuming the literature on biological vulnerabilities (Linehan, 1993) to include trait impulsivity as a predisposing vulnerability factor in the development of BPD. Consequently, the presence of impulsivity and aggression traits are thought to manifest into symptoms such as self-injurious behaviour and labile mood. These traits characterise BPD and give rise to difficulties in interpersonal functioning (cf. Crowell, Beauchaine & Linehan 2009; Coffey, Schumacher, Baschnagel et al, 2011).

The biosocial theory has had important treatment implications for individuals with BPD. Dialectical Behaviour Therapy (DBT; Linehan, 1993) was developed as a psychological intervention aimed at building coping skills that will better serve the individual to regulate their emotions and acquire functional social skills. DBT now has a robust evidence base with 27 randomised control trials (Cochrane review–

Stoffers et al. 2012) and is recommended by the UK National Institute for Clinical Excellence (NICE, 2009; 2015) to treat BPD.

Psychosocial and interpersonal impairment in personality disorders

Psychosocial and interpersonal impairment has been widely investigated and illustrated across personality disorders subtypes. Skodol, Gunderson, McGlashan et al (2002) examined psychosocial functioning within Schizotypal, Borderline, Avoidant and Obsessive-Compulsive Personality Disorders in comparison to individuals with no personality disorder and patients with Major Depressive Disorder. Patients diagnosed with personality disorders were found to have more psychosocial impairment in relationships, employment and in leisure when compared to individuals with Major Depressive Disorder. The authors proposed that personality disorders thought to be more severe (with regards to symptomatology) result in greater levels of psychosocial impairment.

This deficit in prosocial skills has also been noted specifically within the BPD population; a systematic review by Lazarus, Cheavens, Festa et al (2014) noted a lack of trust and cooperation within the interpersonal relationships of BPD patients. Similar research conducted by Unoka, Seres, Aspan et al (2009) identified that BPD patients were found to be less optimistic than controls (and anticipated a worse outcome for their investment) whilst engaging in a trust themed game. The authors suggest that individuals with BPD hold a negative representation of others and reduced trust during interpersonal interactions, creating a pathway for problems in interpersonal relationships.

Further investigation into interpersonal impairment within the BPD population unveiled an inflated incidence of risk taking behaviours and traits of impulsivity (Coffey, Schumacher, Baschnagel et al. 2011). Research conducted by the authors also revealed poorer behavioural response inhibition within the population when compared to matched controls. These findings go some way to explain the unstable nature of BPD interpersonal relationships; greater levels of impulsivity leads to a greater inability to inhibit responses that may be considered socially inappropriate and thus damaging to interpersonal relationships.

The association between betrayal events and subsequent social skills deficit is evident. One may hypothesise that betrayal events result in limited exposure to prosocial behaviour and positive experiences with others. The exposed individual is instead primed for negative outcomes when interacting with others and behaves in a less cooperative and less trusting manner as a result (Unoka, Seres, Aspan et al, 2009).

Rationale

The BTI and BBTS successfully captured the occurrence of betrayal trauma events experienced by the individual. However, the scales focus primarily on the frequency of betrayal trauma events and do not capture the cognitive, emotional and behavioural consequences of betrayal experiences. Moreover, these features are yet to be examined amongst individuals diagnosed with personality disorders despite evidence highlighting the predictive power of betrayal experiences and personality disorder traits. The lack of literature regarding the construct of betrayal amongst clinical groups has been acknowledged (Rachman, 2010). The development of a

reliable psychometric measure could lead to a better understanding of the impact of betrayal experiences on individuals with a personality disorder.

Aims of the study

This study aims to develop a measure of impairment following experiences of betrayal in individuals with personality trait pathology. The newly developed measure will therefore attempt to better encapsulate the construct of betrayal by measuring both the occurrence, and consequences caused by, betrayal events.

The study also aims to identify whether individuals who report a history of betrayal experiences are more likely to possess personality trait pathology, report difficulties with interpersonal relationships (as measured by the IIP-PD) and difficulties with social functioning (as measured by the SFQ). Given that the literature implicates early experiences of betrayal events amongst individuals with a diagnosis of personality disorder, it is possible that betrayal events may serve as a moderating factor in the manifestation of interpersonal problems.

Hypotheses

Based on the literature it is hypothesised that:

1. Participants who score highly on the BBTS (Goldberg & Freyd, 2006) would also present with high scores on the newly constructed Betrayal Response Scale (BRS).

2. Participants who score highly on the personality disorder screening measure (Standardised assessment of Personality: Abbreviated Scale (SAPAS; Moran, Leese, Lee et al. 2003) would report high responses to betrayal as measured by the BRS.
3. Experiences of betrayal as measured by the BRS would positively correlate with interpersonal problems as measured by the IIP-PD (Pilkonis, Kim, Proietti et al 1996).
4. Experiences of betrayal as measured by BRS would positively correlate with social functioning difficulties as measured by the Social Functioning Questionnaire (SFQ; Tyrer, Nur, Crawford et al, 2005).

2. Method

Design

This was a correlational study using a cross-sectional design. Participants were required to complete a series of self-report questionnaires via an online platform. Ethical approval was obtained prior to recruiting for the study. The East Midlands-Nottingham 2 Research Ethics committee granted ethical approval to conduct the study (See Appendix B). The study also complied with University College London (UCL) Data Protection Act and indemnity was granted through UCL insurance.

Development of the Betrayal Response Scale

The researchers conducted a focus group to gather information on the personal experiences and perceptions of betrayal. Participants were recruited from a specialist adult personality disorder service. Participants were invited to describe and discuss the cognitive, emotional and behavioural impact of their betrayal experiences (See Appendix H for themes). A subsequent focus group was conducted within the same service with clinical staff. The staff group consisted of 16 members all of whom provide psychological therapy for individuals with a diagnosed personality disorder (See Appendix H themes).

This information was collated with existing literature to develop a 49 item measure exploring responses to betrayal experiences. The measure was then given to twenty-one accredited and qualified clinicians working in a specialist personality disorder service, to evaluate the face and content validity of the scale. Staff were asked to comment on the acceptability of the scale and to rate the frequency with which they

encounter the items included within their own clinical work. The collective feedback from these clinicians was used to inform a revision of the scale to 29 items.

Psychometric Evaluation of the Betrayal Scale validity and utility

Content validity refers to the extent to which the items within the psychometric measure accurately represent the construct set out to be measured. It has been noted previously that the construct of betrayal encompasses multiple meanings and constructs. Furthermore, there is a dearth of information on the psychological, emotional, social and interpersonal components of betrayal. As discussed, this lack of information is in part the rationale for the current project.

Construct validity encapsulates the degree to which the psychometric measure accurately assesses betrayal experiences. This type of validity establishes how well the BRS reflects the theoretical meaning of the construct of betrayal. It is an important form of validity that overarches other forms of validity such as content, convergent, divergent and criterion (Messick, 1980). Researchers assessed for construct validity through an association between scores obtained on the Betrayal Scale (Komolafe & Shah, Unpublished) and scores obtained on the Brief Betrayal Trauma Scale (BBTS, Goldberg & Freyd 2006) as the BBTS is currently the only validated scale assessing for betrayal experiences.

Face validity is considered to be a subjective form of validity aimed at assessing whether the psychometric items of the measure appear to assess the proposed construct studied as opposed to constructs closely linked to it. Clinical review is noted as a robust method to gain face validity. Face validity is an important

component of developing the measure as without it the measure may be misinterpreted and of little clinical utility.

Concurrent validity examines how well the measure corresponds to existing external criterion data that is also administered during the study. The Betrayal Scale is yet to be validated and as such it will be used alongside a validated psychometric test of betrayal (in this case the BBTS, Goldberg & Freyd, 2006). A high correlation between the two psychometric measures would suggest that the Betrayal Scale has high concurrent validity. Concurrent validity also allows for a comparison of the predictive ability of the BRS and BBTS on interpersonal difficulties.

Convergent validity examines the relationship of a construct being measured against other constructs that are expected to be related to it. In this current study, betrayal is expected to correlate with measures of social impairment and interpersonal problems.

Eligibility Criteria

The eligibility criteria required all participants to be over the age of 18 years old and able to read, write and speak English. The exclusion criteria was set so that participants were unable to take part in the study if they were experiencing any current florid psychotic symptoms, had acquired a personality disorder as a result of head injury, had any current forensic risk and a WAIS-V IQ below 70. Exclusion criteria was stated clearly on all recruitment resources. The exclusion criteria was set as such to remove any potential variables that may impede an individual's capacity to give informed consent. The decision to conduct an adult only study was based on the fact that there is very little empirical evidence on the effectiveness of

treatments for young people with a personality disorder diagnosis (Adshead, Brodrick, Preston et al. 2012). All the outcome measures and patient information literature within the study were written in English as there were no validated versions of the psychometric measure in additional languages at the time the study was conducted. The design of the study meant that it was not possible to clinically verify that participants met the inclusion and exclusion criteria set by the study. The researchers relied on the authenticity of self-report and capacity of the participants to participate only if they met the eligibility criteria as set.

Sample Size

Power analysis for the relationship between interpersonal functioning and betrayal experiences was informed by previous work conducted by Kaehler and Freyd (2009). The authors explored the relationship between betrayal trauma experiences and borderline personality characteristics in a college sample. A power calculation based on these findings specified an alpha value set at 0.05 and the desired power conventionally set at 0.80. The resulting sample size for this study was 434, exceeding the minimum sample size needed (which was calculated to be 250).

Recruitment

Recruitment was conducted predominantly through an online social media and community campaign across multiple forums. A website (<http://www.research-betrayal.com>) was constructed for the sole purpose of recruitment, the website landing page included information about the study, researchers and access to the online study hosted by POD (Patient Online Database) through a hyper-link. POD is

an electronic data collection system that hosts a series of psychometric measures to an accessible website. Participants were also recruited through poster advertisements within NHS Trust services which included: secondary care psychology services, a specialist adult personality disorder service, local IAPT (Improving Access to Psychological Therapies) services, early intervention psychosis services, community rehabilitation teams; a local GP service and local sites of the mental health charity Mind.

Social media forums Twitter & Facebook were also used to promote the study as were multiple research websites ('Call for participants', 'psychology research on the net', 'Clinpsych' forum and 'The inquisitive mind'). Poster advertisements were also placed around a university campus and the study was promoted on an internal university research recruitment database SONA ('Sona systems'). Recruitment was carried out with another doctoral trainee investigating emotion regulation difficulties as a predictor of betrayal events experiences (Shah, 2016).

Participants

Once all the data from the study was collated and reviewed, data sets were removed from the study if more than one third of the response items were incomplete. A total of 616 participants took part in the online study, following the removal of incomplete data, the final study sample consisted of 434 participants.

Basic Demographics

The present study consisted of 434 participants (341 females, 51 males and 42 who did not wish to disclose their gender) with an age range of 25 to 34 years old. Socio demographic data was also gathered on the employment, ethnicity, region, highest level of education achieved and marital status- Age was shown to be negatively skewed. Some of these demographics are potential covariates to be controlled for in analysis. Table 1 shows the demographic characteristics of the study sample.

The sample illustrated that 54.6% reported living in West Europe, 36.6% in North America, 2.1% in Central America, 1.9% in Asia and the rest of the sample were living in Eastern Europe (0.9%), Middle East (0.9%), South America (0.5%), North Africa (0.5%), Oceania (0.9%) and 1.2% did not wish to disclose their region.

Analysis of the demographics was also conducted on the participants who were excluded from the study as a result of incomplete data. Similar to the demographics of the study sample, the excluded participants had a large proportion of female participants (n= 122), 27 males, 33 did not wish to disclose their gender with an age range of 25 to 34 years old. Due to the substantial gender difference noted within the study sample, gender would be an important covariate to analyse as it may influence responses on the BRS given that females are more likely to experience sexual abuse in childhood and late adolescence (Finkelhor, Shattuck, Turner et al, 2014).

Table 1: Demographic variables of study sample

Gender	Female	Male	Gender not Specified
N	341	51	42
Age	Range 25 to 34 yrs	Range 25 to 34 yrs	Range 35 to 44 yrs
	N (%)	N (%)	N (%)
18 to 24 years	131 (38.40)	24 (47.10)	11 (26.20)
25 to 34 years	142 (41.60)	14 (27.50)	12 (28.60)
35 to 44 years	30 (8.80)	6 (11.80)	8 (19.00)
45 to 54 years	22 (6.50)	2 (3.90)	5 (11.90)
55 to 64 years	12 (3.50)	3 (5.90)	5 (11.90)
65 years and older	4 (1.20)	2 (3.90)	1 (2.40)
Ethnicity			
White British	163 (47.80)	28 (54.90)	31 (73.80)
White Other	72 (21.10)	6 (11.80)	4 (9.50)
Black British-African	19 (5.60)	3 (5.90)	1 (2.40)
Black British-Caribbean/Other	13 (3.80)	1 (2.00)	-
Mixed/Multiple ethnic groups	20 (5.90)	3 (5.90)	3 (7.20)
Ethnicity cont.	Female	Male	Gender not Specified
Arab	2 (0.60)	2 (3.90)	1 (2.40)
Any other group	15 (4.40)	3 (5.90)	-

Did not wish to disclose	6 (1.80)	2 (3.90)	1 (2.40)
Employment			
Student	105 (30.80)	25 (49.00)	7 (16.70)
Employed Part or Full Time	197 (57.80)	19 (37.30)	27 (64.20)
Unemployed	25 (7.40)	5 (9.80)	3 (7.10)
Home Maker	9 (2.60)	-	2 (4.80)
Retired	5 (1.50)	2 (3.90)	3 (7.10)
Education			
Less than Secondary School level	4 (1.20)	-	-
Up to Sixth Form education	140 (41.30)	25 (49.10)	(5) 24.40
University Degree	76 (22.40)	13 (25.50)	9 (22.00)
Postgraduate Qualification	92 (27.10)	11 (21.60)	11 (26.80)
PHD level or higher	27 (8.00)	2 (3.90)	11 (26.80)
Marital Status	Female	Male	Gender not specified
Single	124 (36.5)	22 (44.00)	9 (21.40)
In a relationship	129 (38.00)	18 (36.00)	14 (33.30)
Married	70 (20.60)	8 (16.00)	15 (35.70)
Separated/Divorced	16 (4.70)	1 (2.00)	4 (9.50)
Widowed	1 (0.30)	1 (2.00)	-

Measures

In addition to the measures listed, participants also completed the Patient Health Questionnaire (Kroenke, Spitzer & Williams, 2001); the Generalised Anxiety Disorder scale (Spitzer, Kroenke, Williams et al. 2006); the Clinical Anger Scale (Snell, Gum, Shuck, Mosley and Kite, 1995) and the four item Hopelessness scale (Yip & Chung, 2006) as part of a joint study (see Shah, 2016). The present study and the subsequent analyses however focuses solely on the measures below.

1. Standardised assessment of Personality: Abbreviated Scale –SAPAS (Moran, Leese, Lee et al. 2003). (Appendix C)

The SAPAS is a brief eight item screening interview assessing for the potential presence of any type of personality disorder. Each item encompasses a descriptive statement about the self which the individual answers yes or no (No= 0, Yes= 1). A score of three above on the SAPAS correctly identified the presence of a DSM-IV (APA, 2004) personality disorder in 80 % of a clinical population. Moran, Leese, Lee et al. 2003 suggested that there is a reduction in the positive predictive power of the SAPAS in community samples thus increasing the cut off score allows for a higher positive predictive value (0.90) whilst maintaining favourable levels of sensitivity and specificity of the SAPAS scale (0.82 and 0.89 respectively). Given that the present study extends to clinical and community populations the cut off score was increased to four or more to increase specificity. The SAPAS is succinct and displays good psychometric properties (Hesse & Moran, 2010). The inclusion of this measure was solely as a screening tool and not for diagnostic purposes. The SAPAS took three minutes to complete.

2. The Inventory of Interpersonal problems for patients with personality disorders (IIP- PD; (Pilkonis, Kim, Proietti et al, 1996). (Appendix D)

The IIP-PD is a 47 item scale based on the original Inventory of Interpersonal Problems (IIP) measure (Horowitz, Rosenberg, Bear et al, 1988). The IIP- PD takes no more than ten minutes to complete, contains five subscales (Interpersonal Sensitivity, Interpersonal Ambivalence, Aggression, Need for Social Approval and Lack of Sociability) and assesses for chronic difficulties within interpersonal relationships. Respondents rate their agreement with each item based on a five point Likert scale ranging from zero (not at all) to four (extremely). The measure has also been reported to have good positive predictive power of a personality disorder (ranging from 0.61 to 0.79). The internal consistency of the IIP-PD is high (ranging from 0.83 to 0.90 (Scarpa, Luscher, Smalley et al. 1999). The measure was also found to have strong internal and external validity in a college sample ($p < 0.10$) (Scarpa, Luscher, Smalley et al. 1999).

3. The Brief Betrayal-Trauma Survey (BBTS; Goldberg & Freyd 2006). (Appendix E)

The BBTS is a twenty four item self-report measure aimed at capturing the experience of betrayal events both prior to and after 18 years old. The measure takes seven minutes to complete, it categorises the experience of betrayal events into low, moderate and high classifications depending on whether the mistreatment is by someone close to the victim, not so close or a non-interpersonal event i.e. a natural disaster. The BBTS has been found to have sufficient test re-test reliability with Pearson correlation values ranging from 0.26 to 0.72 (Goldberg & Freyd, 2006).

4. The Social Functioning Questionnaire (Tyrer, Nur, Crawford et al, 2005).

(Appendix F)

The Social Functioning Questionnaire (SFQ) is an eight-item self-report scale aimed at capturing the perceived social functioning of an individual. The respondent rates their perception of difficulties across eight domains of social functioning on a four point scale. The four point scale takes 5 minutes to complete and includes the options: 'most of the time', 'quite often', 'sometimes' and 'not at all'. Total sum scores range from zero to twenty four, the data (Tyrer et al., 2005) suggests that a score of ten or more reflects poor social functioning. The social functioning measure has been commended for its brevity and good scaled scoring in comparison to other social functioning measures (Blount, Evans & Birch et al, 2002).

5. Betrayal Responses Scale (BRS); Komolafe & Shah, Unpublished).

(Appendix G).

The 29 item questionnaire is composed of items assessing for the cognitive, emotional, behavioural and physiological impacts of betrayal events. The BRS takes between seven to ten minutes to complete. Responses were rated on a five point Likert scale of strongly agree to strongly disagree. There were 6 reverse items (Item two, nine, sixteen, twenty-four, twenty-six and twenty-nine) in the measure to reduce response bias. The interpretation of the total score is obtained by cumulating the total score of all items, the maximum score possible is 145. The higher the total score, the greater the impact of betrayal events on the respondent. The procedure used to develop this questionnaire was as follows:

Procedure

All psychometric measures were pooled into a random order and made accessible through POD. After selecting the URL, participants were presented with a landing page displaying participant information on the purposes of the study (see Appendix I). Participants were invited to consent to the study and informed of their right to withdraw their consent at any point prior to clicking ‘submit’. Consent was indicated by selecting the relevant tick boxes (see Appendix J). The subsequent pages hosted the measures utilised in the study. At the bottom of each page, the participant had the option to proceed, exit or select a help button to access resources (relaxation exercises, distress tolerance exercises) aimed at regulating any feelings of distress that might arise (see Appendix K). Should participants select the latter option, they were able to return to the study if they felt able to as the resources appeared in a separate tab to POD. If an individual opted to exit the study, the study would no longer be accessible and the participant would have to access the URL again and start from the beginning in order to complete the study. This was to ensure that no record of the respondent’s IP address was retained and anonymity was maintained throughout.

On completion of the study, participants had access to a debriefing sheet (see Appendix L). A compensatory donation of £1 was made by the researchers to a charity selected by the participant at the end of the study. Participants had a choice of three charities; Mind (a UK based national charity service providing emotional and practical support for individuals experiencing mental health difficulties), Relate (the UK’s largest counselling and emotional support service for individuals with

relationship difficulties) or Emergence (an on-line user-led service supporting individuals diagnosed with, and affected by, personality disorders).

Statistical analysis

All data from the study was downloaded from the POD database into Microsoft Excel. All data was checked and total scores were calculated after accounting for reverse items within the relevant psychometric measures. Respondents with a data set that was less than two thirds complete were removed from the full data set prior to exporting it into SPSS 22 (IBM Corp, 2013). Data sets with less than a third of the data missing were processed using Multiple Imputation analysis. Following this, data was assessed to ascertain whether it met the necessary assumptions for parametric testing.

The primary analysis of the data consisted of a series of correlational analysis and exploratory factor analysis to test the hypotheses with the following steps:

1. Exploratory factor analyses was conducted to evaluate the psychometric properties of the betrayal response scale (Komolafe & Shah, Unpublished).

Exploratory factor analysis is a complex statistical method aimed at identifying significant underlying patterns or relationships between selected factors. Principle components analysis is a type of analysis that will identify the strength of the inter-relationship of the variables within the measure. Items found to have a weak inter-relationship within the measure were removed and the BRS was reduced to items that were found to have a correlation value of at least 0.30. To estimate the reliability of the scale, the Chronbach's Alpha statistical test was conducted. This

assessed for the internal consistency of the items within the scale and determined how well the items relate to each other.

2. Correlational analysis was conducted to ascertain whether the betrayal response scale (Komolafe & Shah, Unpublished) is positively associated with the validated measure of betrayal events (BBTS; Goldberg & Freyd, 2006).

3. Correlational analysis was conducted to assess for any relationship between personality pathology (measured by the SAPAS; Moran, Leese, Lee et al. 2003) and the betrayal response scale (BRS, Komolafe & Shah, Unpublished).

4. Correlational analysis was conducted to establish whether a positive correlation was evident between betrayal responses (as measured by the BRS) and interpersonal problems (as measured by the IIP-PD, Pilkonis, Kim, Proietti et al, 1996).

5. Finally, correlational analysis was conducted to establish whether a positive correlation was evident between betrayal responses (as measured by the BRS) and social functioning (as measured by the SFQ; Tyrer, Nur, Crawford et al, 2005).

3. Results

Assumptions of Normality

The Kolmogorov-Smirnov test of normality indicated that the distribution of the BRS scores for the whole sample was not normally distributed ($D(434)=0.50$, $p<0.05$). However deviations from a comparable normal distribution are common within large samples (Field, 2014). As such the skewness and kurtosis statistics are considered to be more reliable measures of normality. The distribution of BRS scores was slightly negatively skewed (-0.382 , $SE=0.12$) and the kurtosis value was minimal (-0.147 , $SE=0.23$). The histogram (see Figure 1) indicates a very minimal negative skew in the data.

In order to assess for outliers within the BRS total scores a boxplot was also conducted. The resulting boxplot revealed one mild outlier (a score of 49). Although this value was not an extreme outlier, it was removed and the distribution of the BRS scores were re-evaluated to establish whether this made any changes to the normality. The resulting distribution showed very little difference in comparison to the original histogram. The Kolmogorov-Smirnov test value was $D(434)=0.49$, $p<0.05$ indicating a violation of the assumption of normality. The kurtosis and skewness values were -0.212 ($SE=2.34$) and -0.352 ($SE=0.117$) respectively. Further comparative analysis of the boxplots prior to and after the removal of the mild outlier also revealed no difference to the distribution.

To determine whether the outlier had an influence on the BRS scores, a correlational analysis was conducted with and without the outlier. The results of which indicated near identical scores with a marginal 0.005 difference (without outlier, $r=0.356$,

$p < 0.001$. With outliers, $r = 0.351$, $p < 0.00$). These results justify the inclusion of the outlier in the analysis as the values do not impact on the distribution or validity of the findings. Including the outlier may serve as a helpful representation of the variability within the study sample.

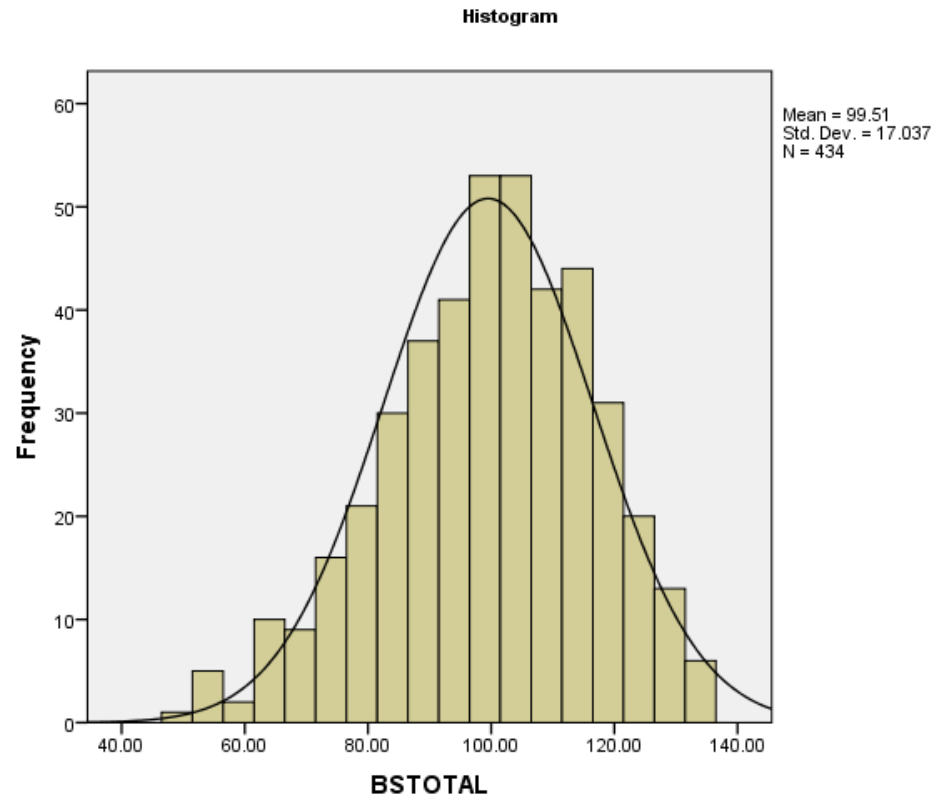
The Kolmogorov-Smirnov test values for the SAPAS, BBTS, IIPD and SFQ were also found to violate the assumptions of normality $D(434) = 0.50$, $p < 0.05$). Again, this is to be expected given the literature regarding distribution within large study samples. However, skewness and kurtosis values were assessed alongside a histogram of each variable to help inform the measure of reliability.

The SAPAS scores skewness value indicated a slight positive skew (0.368, $SE = 0.117$) and minimal kurtosis value (-0.457, $SE = 0.234$). The BBTS scores skewness value indicated a positive skew (1.846) and a minimal kurtosis value of 4.315. The IIPD scores also indicated a positive skew (0.870, $SE = 0.117$) and a positive kurtosis value of 1.063, $SE = 0.234$). Finally, the SFQ scores indicated a positive skew value of 0.558 ($SE = 0.117$) and a minimal kurtosis value of -0.11, ($SE = 0.234$).

The histograms and boxplots for all variables were also reviewed, the histogram of the SAPAS scores illustrated a normal distribution with a peak of mid-range scores. The boxplot revealed four mild outliers (participant scores of 8). The outliers were removed and the distribution of the scores were analysed, however the histogram showed marginal difference and was no closer to a normal distribution. The histogram of the BBTS scores illustrated a negative skew of the data and two extreme outliers within the data (high scores of 72 and 58). Again the outliers were

removed and the distribution of the data reassessed however the histogram showed marginal difference and was no closer to a normal distribution. Similarly the histogram of the IIP-PD also indicated a negative skew within the data however there were no extreme outliers noted that may be responsible for the slight skew within distribution. Finally, the SFQ scores showed a positive skew to the distribution of the scores and a slightly high cluster of low end scores on the scale. However, the boxplot did not reveal any extreme outliers within the data.

Figure 1: Distribution of betrayal response scale scores.



Summary of data distribution

As previously noted, normal distribution is rare within large samples instead, large data sets are more likely to adhere to the principles stated within the central limit theorem (Field, 2013). Given this, parametric statistical analysis was conducted as this is the most appropriate approach for interval and ratio data. Identified outlier scores made no difference to the distribution of the data once removed and as such, the scores were retained for further analysis. Given that the inclusion of the outliers did not have an impact on the distribution of the sample data, it was deemed beneficial to retain these items.

Exploratory factor analysis of the betrayal response scale (BRS)

Following the analysis of the BRS data distribution, exploratory factor analysis was conducted to establish the construct validity of the BRS. Exploratory factor analysis served to establish the interrelated variables responsible for the common variance within a scale. This type of analysis allowed for the removal of redundant items resulting in a refined measure of betrayal responses.

Meeting the requirements for a factor analysis

Any resulting factor should have at least three variables, a correlation r value of at least 0.30 must be present and a minimum sample size of 300 participants (Field, 2009; Yong & Pearce, 2013). The present study had 434 participants and more than three variables. As such the data set met the requirements for an exploratory factor analysis.

Exploratory Factor analyses

The 29 items of the betrayal response scale (BRS) were analysed using the Principal Components Analysis (PCA), this method has been deemed the most appropriate methodology to use when developing a psychometric scale (Rattray & Jones, 2005). PCA identified the primary (and subsequent) components responsible for the total variance within the scale. A Direct Oblimin rotation of the factors was selected given the likely correlation between the factors. The suitability of the data was reviewed by inspecting the correlation matrix values. A full inspection of the data was conducted to establish whether the majority of the coefficients values were .3 and above. Items that failed to meet this criteria were removed (Q2, Q3, Q7, Q9, Q16, Q24, Q25 and Q26) subsequent statistical analysis was conducted without the aforementioned items.

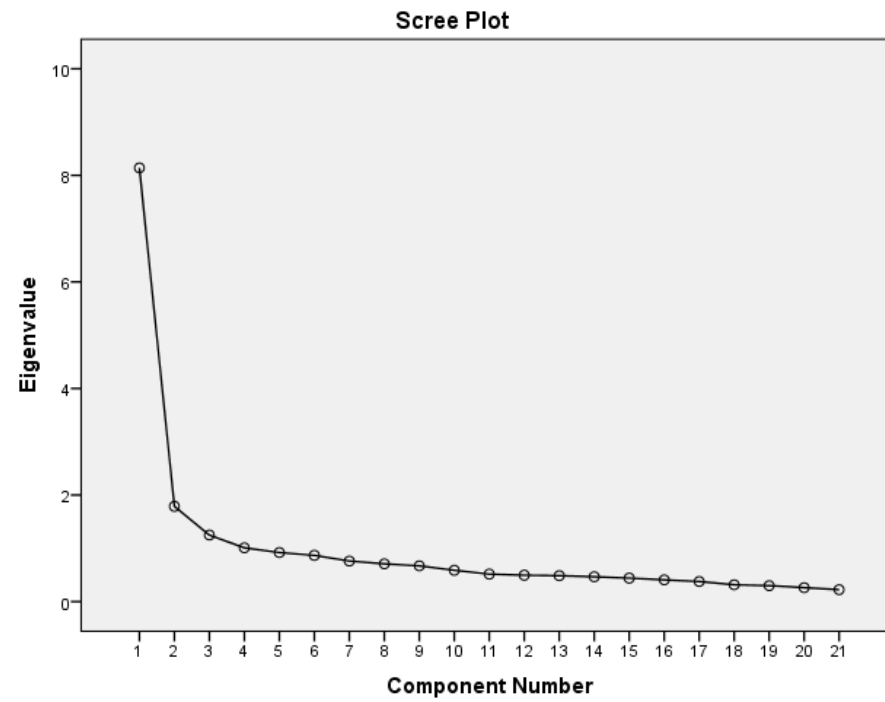
Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970) were also assessed to ensure that the pattern of correlation within the data meet the criteria necessary to conduct a PCA. The KMO statistic obtained was 0.933, this exceeded the minimum threshold of 0.6 and indicated that the patterns of correlation within the data set are reliably compact meaning that a factor analysis should be able to yield reliable factors. The Bartlett's Test of Sphericity statistic was statistically significant ($p < 0.001$).

To establish the most appropriate factor structure, the Eigenvalues were reviewed. Eigenvalues serve to illustrate the importance of a factor and thus whether or not to retain it, a minimum value of 1 is considered a suitable cut off point. However, Field (2013) proposed that this value may overestimate the number of factors to include

and is most accurate if the data set exceeds 250 participants and the average communality value exceeds 0.6. Given that the average communality value of the data set did not exceed 0.6, the scree plot was also be reviewed.

Based on the initial eigenvalue, four factors were extracted. A review of the scree plot however indicates points of inflexion at two and three factors (see Figure 2).

Figure 2: Scree Plot



Parallel analysis was conducted to determine whether retention at two or three factors would be appropriate. The Monte Carlo PCA for parallel analysis software uses Monte Carlo simulation to compute random eigenvalues based on the sample size and variable numbers within the data. The Monte Carlo PCA computed a threshold eigenvalue of 1.51. Only two factors had an eigenvalue that exceeded 1.51 and as such, only the two strongest factors were retained. A final analyses of the data set with a fixed number extraction value of two confirmed a two component solution was the most appropriate factor structure.

In order to refine the scale to ensure that the optimum amount of total variance is explained by the two factors, a review of the communalities values was conducted. This revealed that Item 10 had a weak correlation value of $r=.252$. Following the removal of this item, the exploratory factor analysis was rerun. A two factor model accounted for a substantial amount of the variance in the scale (48.59%), most variance was explained for by the first factor (39.76%). Based on the criterion of a minimum correlation coefficient of .30, there was no item within either factor that failed to meet this threshold. Table 2 illustrates the item loadings across these two factors.

Table 2: Loading Values of the Two Factors

Component Matrix		
Item	1	2
BRS-15	.808	
BRS-18	.797	
BRS-20	.756	
BRS-14	.749	
BRS-28	.744	
BRS-12	.728	
BRS-19	.702	-.389
BRS-21	.688	
BRS-13	.681	
BRS-11	.677	
BRS-8	.658	
BRS-22	.624	
BRS-17	.602	.324
BRS-1	.596	
BRS-23	.575	
BRS-4	.531	.387
BRS-27	.408	.544
BRS-29		.536
BRS-6	.390	.471
BRS-5		.399

The content of the items within each factor structure were reviewed and existing literature was used to guide labelling factor one as ‘Internalised Negative Emotions’ and factor two as ‘Negative Interpersonal Responses’. The interpretation of the factors is consistent with research into the impact of betrayal experiences (Koehler & Gershoff, 2003; Rachman, 2010). The component correlation matrix value of .354 indicated that the constructs measured were interrelated and adopting the oblique rotation method, direct Oblimin, was appropriate.

The considerable overlap between the two factors suggested that the scale may work best with the two factors combined, particularly as the highest loading item (Q27) on factor 2 also loads onto factor 1 and only two items are distinct to factor 2 (Q29 and Q5). Furthermore, on a theoretical level, one would expect negative emotions to be related to negative interpersonal responses given that emotional reactivity and emotional cut-off have been found to contribute to the variance in interpersonal problems (Wei, Vogel, Ku et al. 2005). As such, the scale may work best combined. However, as the statistical analysis has revealed a two factor structure with the highest loading items on factor 1 seeming to account for negative emotions and the highest loading items on factor 2 accounting for negative interpersonal responses, it would prove fruitful to assess the psychometric properties of the separate subscales.

Reliability Analysis

To verify the reliability of the refined betrayal response scale (BRS) the Chronbach’s α value was calculated for both subscales obtained from exploratory factor analysis

(‘internalised negative emotions’ and ‘negative interpersonal responses’). The overall Chronbach’s α value for the internalised negative emotion subscale was high at .918. Analysis of the negative interpersonal responses subscale revealed a Chronbach’s α value of .657, this value is considerably low in comparison. Literature suggests that a Chronbach’s α value of at least 0.7 is acceptable for psychometric measures due to the diversity and complexity of psychological constructs (Kline, 1999; DeVon, Block, Moyle-Wright et al. 2007). It is worth noting that Kline (1999) suggested that a Chronbach’s α value of less than 0.7 does not necessarily indicate low reliability when assessing diverse psychological constructs. Given that betrayal responses is a complex construct, one might interpret the Chronbach’s α value of the negative interpersonal responses BRS subscale to be satisfactory.

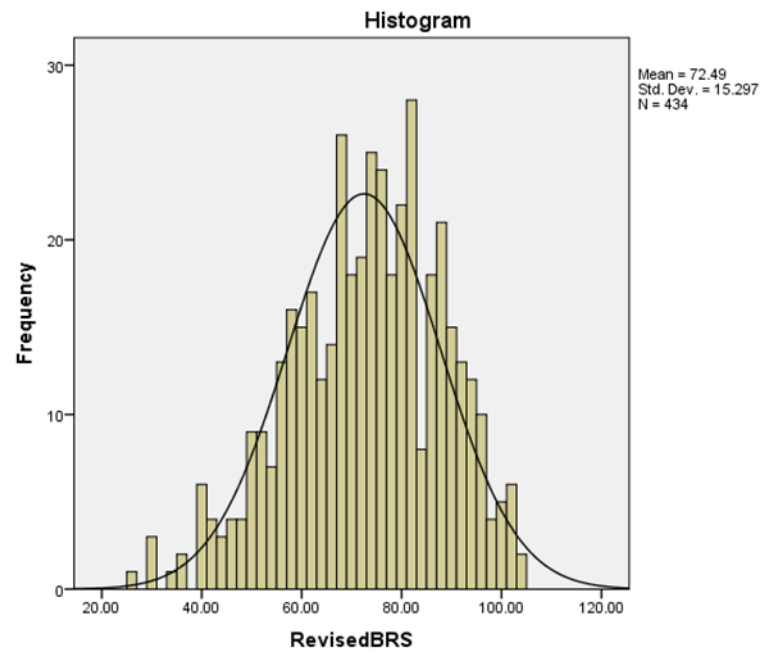
Analysis of the full scale revealed a Chronbach’s α value of .905 indicating a strong internal consistency amongst the retained items within the BRS. Given that the Chronbach’s α value was highest for the internalised negative emotions subscale, it is possible is reviewed in the subsequent analysis.

Assumptions of Normality for the BRS

The Kolmogorov-Smirnov test of normality indicated that the distribution of the betrayal response scale (BRS) scores for the whole sample was not normally distributed ($D(434)=0.46$, $p<0.05$). However deviations from a comparable normal distribution are common within large samples (Field, 2014). As such the skewness and kurtosis statistics were considered to be more reliable measures of normality. The distribution of the BRS scores was slightly negatively skewed (-0.361,

SE=0.12) and the kurtosis value was minimal (-0.215, SE=0.23). The resulting histogram (see Figure 3) indicates a very minimal negative skew in the data.

Figure 3: Distribution of the BRS



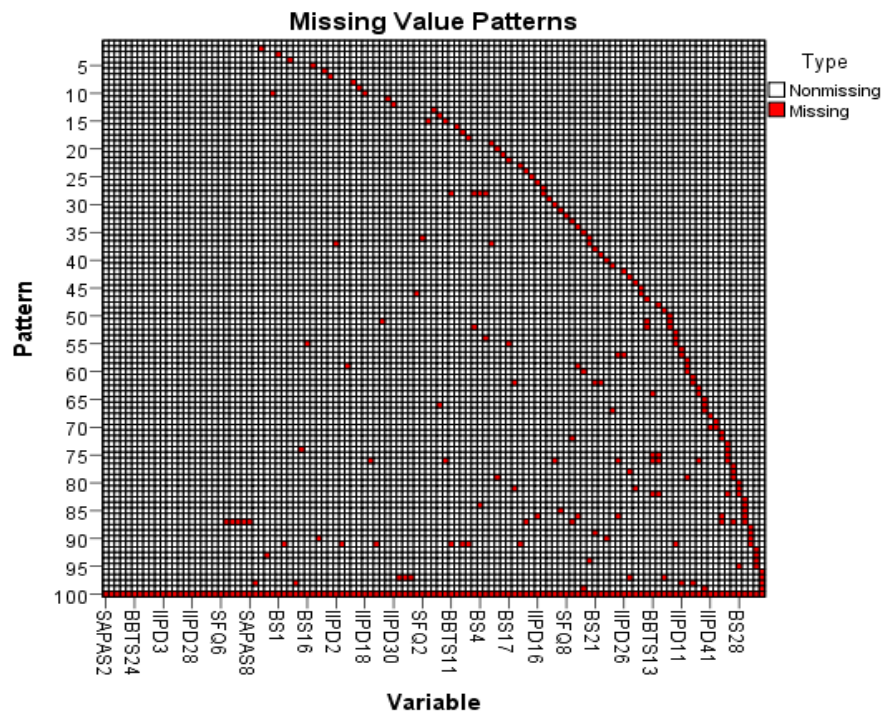
In comparison to the original BRS distribution, the BRS has less of a negative skew but has a flatter distribution. The BRS will be used in subsequent analysis as the initial analysis suggests that the BRS has more robust psychometric properties.

Missing data

To ensure the robustness of the data set, missing values were analysed and calculated using multiple imputation. The analysis revealed that 29.89% of the full data set was missing at least one value. The highest percentage of missing values within a given variable was 1.8%. The data was assessed to establish whether the missing values followed a systematic pattern. There was no monotonicity present in the data (see figure 4) which justified the use of multiple imputation as the missing values were most likely missing at random.

Mersenne Twister is a pseudorandom number generator known to rectify flaws in datasets by generating whole number integers in place of missing data. Pooled data sets were then used in the primary analysis for this study.

Figure 4: Missing Value Patterns within the Data Set



Hypotheses analyses

Hypothesis 1: There would be a positive correlation between betrayal responses, as measured by the BRS and betrayal experiences, as measured by the BBTS.

A correlation analysis was performed to establish whether a positive relationship was present between the BBTS scale and the revised betrayal response scale. It was hypothesised that the two scales would be positively correlated as both scales assess for betrayal experiences thus an indication of betrayal experiences on one scale should relate to an indication of betrayal experiences on the mutual scale. The mean score of the BRS was 72.49 (SD= 15.30, range= 26-104). The mean score for the BBTS was 30.13 (SD=6.90, range= 22-72). A significant positive correlation, of a medium effect size, was found between the BBTS and BRS, $r=.354$, $p<0.001$. This correlation remained significant after controlling for gender, $r(389)=.369$, $p<0.001$. The correlation also remained significant after controlling for ethnicity $r(431)=.353$, $p<0.001$. Both covariates were controlled for given the overrepresentation of white European females within the sample.

A correlational analysis was also performed to establish whether a positive correlation would be present between the BBTS and the separate subscales of the BRS. The factor 1 subscale labelled ‘internalised negative emotions’ (INE) was found to have a significant positive correlation, of a medium effect, with the BBTS ($r=.349$, $p<0.001$). This significant relationship remained after controlling for gender ($r(389)=.354$, $p<0.001$). This significant relationship also remained after controlling for ethnicity $r(431)=.338$, $p<0.001$.

The factor 2 subscale labelled 'negative interpersonal responses' (NIR) was also found to have positive correlation, of a medium effect size, with the BBTS ($r=.370$, $p<0.001$). Again, this significant relationship remained and the effect size did not diminish after controlling for gender ($r(389)=.372$, $p<0.001$). The correlation also remained significant after controlling for ethnicity ($r(431)=.364$, $p<0.001$).

Statistical analysis showed that the relationship between each of the two subscales and the BBTS is of a similar effect size and strength when compared to the relationship between the BBTS and the full BRS.

Hypothesis 2: There would be a positive correlation between betrayal responses, as measured by the BRS, and personality pathology, as measured by the SAPAS.

A correlation analysis was performed to establish whether a positive relationship was present between the BRS and the SAPAS. It was hypothesised that the two scales would positively correlate given that betrayal experiences are more likely to occur within personality disorder populations. The mean score of the SAPAS was 3.18 (S.D=1.85, range= 0-8). A significant positive correlation of a large effect size was found between the SAPAS and BRS, $r=.546$, $p<0.001$. This correlation remained significant after controlling for gender $r(389)=.551$, $p<0.001$.

Further correlational analysis was conducted on the two subscales of the BRS and its relationship with the SAPAS. The factor 1 subscale labelled 'internalised negative emotions' (INE) was found to have a large positive correlation with the SAPAS ($r=.575$, $p<0.001$). This significant relationship remained after controlling for gender ($r(389)=.576$, $p<0.001$). The significant relationship also remained after controlling for ethnicity $r(431)=.522$, $p<0.001$. The factor 2 subscale labelled

‘negative interpersonal responses’ (NIR) was also found to have a large positive correlation with the SAPAS ($r=.528$, $p<0.001$), this significant relationship remained after controlling for gender ($r(389)=.533$, $p<0.001$). Similarly, the significant relationship remained after controlling for ethnicity $r(431)=.566$, $p<0.001$.

A comparative correlation analysis was conducted to establish whether a similar relationship was evident between the BBTS and the SAPAS. The SAPAS was significantly correlated to betrayal experiences occurring under the age of 18 years old, $r=.363$, $p<0.001$ and again in adulthood, $r=.287$, $p<0.001$. Using Cohen (1988) measure of effect sizes, the noted correlations were found to be of a medium & small effect size respectively. A significant positive correlation of medium effect size was also found between the SAPAS and the total BBTS scores, $r=.357$, $p<0.001$. These results illustrate that the BRS may be more sensitive to traits of personality pathology than the BBTS.

Hypothesis 3: There would be a positive correlation between betrayal responses as measured by the BRS and the subscales of the interpersonal difficulties, as measured by the IIP-PD.

A correlation analysis was performed to establish whether a positive association was present between the BRS and the IIP- PD scale. The mean value of the IIP-PD Sensitivity subscale was 24.08 ($SD=7.17$, range= 44-10). The mean value of the IIP-PD Ambivalence subscale was 14.06 ($SD=4.98$, range= 36-8). The mean value of the IIP-PD Aggression subscale was 11.10 ($SD=4.47$, range= 28-7). The mean value of the IIP-PD Approval seeking subscale was 19.79 ($SD=6.53$, range= 36-7) and finally, the mean value of the IIP-PD Lack of Sociability subscale was 18.40 ($SD=7.81$, range= 40-9).

It was hypothesised that the two scales would be positively correlated given the literature indicating interpersonal pathology may arise in environments of neglect or maltreatment. All five scales within the IIP-PD were positively correlated with the BRS ($p < 0.001$). The effect sizes ranged from medium to large (See table 3 for coefficient values). Table 4 illustrates that the significant relationships remained after controlling for gender. It is worth noting that gender had very little influence in controlling for the relationship between interpersonal difficulties and betrayal responses.

Further analysis was conducted on the two subscales of the BRS and its relationship with the IIP-PD. All five scales within the IIP-PD were positively correlated with the INE ($p < 0.001$) and NIR ($p < 0.001$) - (See table 5 & 6 respectively for coefficient values). Similarly, the effect sizes ranged from medium to large. These significant effect sizes remained after controlling for gender.

Table 3: Correlation between the BRS scores and IIP-PD Subscales

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
R- BRS	.663**	.345**	.406**	.511**	.512**

**Significant at p<.001

Table 4: Correlation between BRS Scores and IIP-PD Subscales after controlling for gender

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
BRS	.659**	.355**	.411**	.507**	.511**

**Significant at p<.001

Table 5: Correlation between BRS INE Subscale Scores and IIP-PD Subscales

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
BRS INE Subscale	.657**	.329**	.395**	.511**	.499**

**Significant at $p < .001$

Table 6: Correlation between BRS NIR Subscale Scores and IIP-PD Subscales

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
BRS NIR Subscale	.568**	.416**	.456**	.394**	.454**

**Significant at $p < .001$

A comparative correlation analysis was conducted to establish whether a similar relationship was evident between the BBTS and the IIPD subscales. Table 7 illustrates that significant relationships were found between the BBTS and the IIPD subscales of small to medium effect sizes. These significant relationships remained after controlling for gender (See Table 8).

Table 7: Correlation between BBTS Scores and IIP-PD Subscales

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
BBTS	.328**	.358**	.312**	.248**	.261**

**Significant at p<.001

Table 8: Correlation between BBTS scores and IIP-PD Subscales after Controlling for Gender

IIP- PD Subscale	Sensitivity	Ambivalence	Aggression	Approval Seeking	Lack of Sociability
BBTS	.330**	.358**	.312**	.249**	.262**

**Significant at p<.001

Hypothesis 4: There would be a positive correlation between betrayal responses as measured by the BRS and social functioning as measured by the SFQ. A correlation analysis was performed to establish whether a positive association was present between the BRS and the SFQ scale. The mean value of the SFQ was 8.16 (SD=4.30, range=23-0). A significant positive correlation, of a medium effect size, was found between the SFQ and BRS, $r=.495$, $p<0.001$. Gender appeared to have very little influence in controlling for this relationship, the positive correlation remained, $r(389)=.497$, $p<0.001$.

Further analysis was conducted on the two subscales of the BRS and its relationship with the SFQ. Factor 1 (INE) was found to have a medium positive correlation with the SFQ ($r=.480$, $p<0.001$). This significant relationship remained after controlling for gender ($r(389)=.482$, $p<0.001$). Factor 2 (NIR) was also found to have a medium positive correlation with the SFQ ($r=.480$, $p<0.001$). This significant relationship remained after controlling for gender ($r(389)=.482$, $p<0.001$).

A comparative correlation analysis was conducted to establish whether a similar relationship was evident between the BBTS and the SFQ. A significant relationships were found between the BBTS and the SFQ however the effect size was medium ($r=.325$, $p<0.001$), this significant relationship of a medium effect remained after controlling for gender ($r(389)=.326$, $p<0.001$).

Further analysis was conducted between the IIP-PD and SFQ, a strong positive correlation was noted between the two variables ($r=.710$, $p<0.001$). Both measures assess for psychosocial impairment and so this finding is not particularly surprising. However, the noted relationship does serve to emphasise the validity of the BRS to

assess for psychosocial impairment given its significant relationship with both variables.

3. Discussion

This present study examined the relationship between betrayal experiences and personality trait psychopathology through the development of a psychometric measure. The study investigated the psychometric properties and factor structure of the BRS within a community sample. In addition, the validity of the new scale was assessed through comparison with a measure of betrayal experiences (BBTS) and the hypothesised relationship with interpersonal functioning.

The findings of the study suggest that the BRS, a measure developed to assess for impairment following betrayal events, is a reliable and valid instrument. Items of the betrayal scale was successfully reduced into two coherent factors following the removal of eight items which failed to meet the sufficient coefficient value of 0.30. The low coefficient values amongst these items suggested that they would not reliably assess for betrayal responses. A two factor model accounted for a considerable proportion of the total variance (48.59%). One factor appeared to assess for internalised negative emotional (INE) responses following a betrayal event, whilst the second factor assessed for negative interpersonal responses (NIR). The analysis of the overall reliability of the scale revealed a high Chronbach's α value of 0.905. This suggested that the two factor solution is a reliable measure within community samples. The INE subscale was also shown to have a high Chronbach's α value of .918. Analysis of the NIR subscale revealed a Chronbach's α value of .657, this value was considerably low in comparison. Whilst one cannot discount the potential clinical utility of the NIR, the high reliability value of the INE subscale indicate its potential to serve as a reliable scale in its own right in the assessment of betrayal responses.

Existing measures assess only for betrayal event history, these are the Betrayal Trauma Inventory (BTI; Freyd, DePrince & Zurbriggen, 2001) and the BBTS (Goldberg & Freyd, 2006). The BRS is the first known measure of its kind to assess for the multidimensional responses to betrayal events. As hypothesised, a significant positive correlation ($p < 0.001$) was established between the BRS and the BBTS, this relationship was maintained after controlling for gender and ethnicity. The medium strength of the correlation between the scales indicated satisfactory construct and concurrent validity in the BRS. As the BRS also assesses for additional features not captured by the BBTS, this may explain the muted strength of the correlation between the two variables.

Further analysis was conducted with the BBTS and the BRS subscales, both scales were found to have a significant positive correlation, of a medium effect size, with the BBTS ($p < 0.001$). The NIR held a positive significant relationship with the BBTS ($r = .370$, $p < 0.001$) as did the INE subscale ($r = .349$, $p < 0.001$). Again, the medium strength of this correlation remained significant after controlling for gender and ethnicity.

As predicted, the results also suggest that individuals with high levels of pathological personality traits, as measured by the SAPAS (Pilkonis, Kim, Proietti et al, 1996), were more likely to have marked responses to betrayal events as measured by the BRS ($r = .546$, $p < 0.001$) than a non- PD sample. After controlling for ethnicity and gender the significant and large effect size remained. Analyses were also conducted with the subscales of the BRS and SAPAS. The results identified significant and large effect sizes; The INE subscale had a significant positive relationship with the SAPAS ($r = .575$, $p < 0.001$), as did the NIR subscale ($r = .528$, $p < 0.001$).

Suspected personality trait pathology (measured by the SAPAS) was also predictive of high betrayal event experiences, as measured by the BBTS ($r=.357$, $p<0.001$). These findings are similar to a comparative community based study conducted by Kaehler & Freyd (2012) within which betrayal events were significant predictors of borderline personality traits amongst male and female participants. The findings also corroborate with literature that implicates interfamilial abuse (sexual, emotional and physical) as a predictor of a personality disorder diagnoses, particularly BPD (Battle, Shea, Johnson et al, 2004; Carr, Martins, Stingel et al, 2013; Spataro, Mullen, Burgess et al, 2004).

The similar effect sizes noted between the two scales (BBTS and BRS) and the SAPAS illustrate the ecological validity of the BRS.

The BRS has also been shown to have some specificity in identifying psychosocial impairment and social dysfunction. As predicted, the BRS was significantly associated with all subscales of the Inventory of Interpersonal Problems for Personal Disorders (IIP-PD, Pilkonis, Kim, Proietti et al. 1996). The five subscales were constructed by the researchers as a means to discriminate individuals with pathological personality traits from non-clinical samples. The positive association across all subscales ($p<0.001$) ranged from medium to large effect sizes. This significant relationship remained after controlling for gender. The positive association between the two psychometric measures suggest that the greater the impact of betrayal experiences on the individual, the more likely they are to experience difficulties in their interpersonal relationships. Significant results across these subscales contribute to previously discussed literature implicating experiences of betrayal events with prosocial skills deficits.

Individuals with pathological personality traits are known to have difficulties with prosocial skills such as cooperation and show increased levels of interpersonal conflict and difficulties with emotion regulation within interpersonal relationships (King-Casas, Sharp, Lomax-Bream et al. 2008; Scott, Stepp, & Pilkonis, 2014).

Analysis of the subscales of the BRS and the IIP-PD also revealed significant positive relationships ($p < 0.001$) after controlling for gender. The significant relationships between the BRS and the IIP-PD demonstrate the ecological validity of the developed scale.

A significant positive relationship of the BBTS and the IIP-PD subscales was also identified ($p < 0.001$) however the effect sizes were considerably smaller than that of the BRS and ranged from small to medium.

The study findings also illustrated a medium positive association between BRS and the Social Functioning Questionnaire (SFQ; Tyrer, Nur, Crawford et al, 2005), $r = .495$, $p < 0.001$. This significant relationship remained after controlling for gender. The findings suggest that the greater the impact of betrayal events on the individual, the greater the likelihood that the individual will have difficulties with social functioning. Given that one of the two factors of the BRS assesses for interpersonal difficulties, one would expect impairments in social functioning as interpersonal difficulties increase. These findings are supported by a community study conducted by Belford, Kaehler & Birrell (2011), in which individuals with marked borderline personality traits were found to have poorer relational health following experiences of betrayal trauma. Further analysis with the subscales of the BRS with the SFQ identified a significant positive correlation, of a medium effect size, $r = .480$, $p < 0.001$ for both the INE and NIR.

Analysis of the BBTS and SFQ also revealed a medium positive association between the variables ($r=.326$, $p<0.001$). In comparison to the BRS, the BBTS is of a similar effect size but holds a weaker relationship with the SFQ. One explanation for this might be that the BRS attempts to assess for negative interpersonal experiences and internalised emotions. These two variables are well linked to the regulation of emotions and social functioning. Existing research reports an association between the ability to regulate emotions effectively and effective interpersonal functioning (Vohs & Ciarocco, 2004). Given that emotion dysregulation is a known feature within personality disorders, it may seem unsurprising that a longitudinal study conducted by Gunderson, Stout, McGlashan, et al. (2011) found persistent and severe impairment to social functioning to be a noted feature in BPD. Similarly, occupational dysfunction had also been found to be a particular difficulty amongst cluster A and B personality disorders (Hengartner, Müller, Rodgers et al. 2014).

That notwithstanding, it is important to note that social dysfunction is not specific to individuals with pathological personality traits. Research conducted by Goldsmith, Chesney, Heath, et al. (2013) proposed that betrayal events result in psychological symptoms such as anxiety, depression, intrusion and avoidance, thus an individuals' ability to function in social settings will likely be negatively impacted regardless of any pre-existing psychopathology. It is possible however that this impact is more likely to be temporary in non-clinical groups on account of more effective emotion regulation skills and robust prosocial skills. In these circumstances, it is possible that the negative impact of betrayal events ameliorate over time.

Examination of items

The BRS is constructed of a two factor model of interpersonal difficulties and negative emotional responses. High loading items on the INE scale such as Q15: “I feel worthless when someone betrays me” (0.808) and Q18: “I feel hopeless when someone betrays me” (0.797) suggest that emotions of a complex nature can have a detrimental psychosocial impact on the individual if they are unable to effectively regulate their emotions (Vohs & Ciarocco, 2004). Interestingly, cognitive responses such as Q6 “I think about getting revenge of people who have betrayed me” held the weakest coefficient value (0.390) in factor one. It is possible that some of the items in the scale developed to capture the cognitive appraisals associated with betrayal events were inappropriate.

Unexpected findings were also present in factor two NIR scale, the items possessed weaker coefficient values in comparison to the INE subscale. For instance, Q27 (“When someone betrays me, I hold a grudge for a very long time”) had the highest loading in factor two with a modest correlation value of 0.544. It is possible that poor face validity on this item compromised the responses as the term ‘very long time’ can be interpreted in many ways by the reader. Additionally, Q19 (“I feel rejected when someone betrays me”) featured across both factors but appeared to be negatively correlated (-0.389) to factor two (interpersonal difficulties). It may be that this negative association is best explained by an experience of rejection causing some individuals to appease or withdraw from the relationship rather than engage in externalised antisocial behaviours (Molden, Lucas, Gardner et al. 2009; Richman & Leary, 2009).

Limitations

The present study is not without limitations. One limitation is that the study was conducted within a community sample. Whilst this is the means through which psychometric scales are often developed, the use of a community sample may serve as a constraint on the generalisability of the present findings to clinical samples.

The self-report nature of the study forces the researchers to depend on authenticity within the participants responses. Research suggests that self-report responses are vulnerable to bias and therefore limited in reliability (Austin, Gibson, Deary et al. 1998). Arguably, a repeated measures methodology may help to overcome this as the current study design is of a cross-sectional nature.

The generalisability of the findings were also restricted by the lack of cultural diversity within the study sample. The majority of participants were female and of a white British origin. However the demographics of the community sample in this study appear to reflect the underrepresentation of cultural diversity noted within personality disorder populations (McGilloway, Hall, Lee et al. 2009). Moreover it is important to note that the results of the study remained significant after controlling for ethnicity and gender.

The use of the BBTS presented a limitation for the study in that only sixteen of the twenty-four items specifically assess for interpersonal trauma. Of the sixteen items, ten ask the respondent about experiences of physical or sexual abuse performed by a perpetrator with whom they hold a close relationship. The additional six items ask about abuse performed by an individual the survivor was not close to. The eight items that do not assess for interpersonal betrayal focus on incidents of trauma or physical harm as a result of non-interpersonal events such as a road traffic

incident or natural disaster. Given this, the BBTS is limited in its ability to assess for interpersonal trauma. It is possible that some experiences of interpersonal trauma may have been underestimated within the study sample as a result. As a consequence, the construct validity for the Betrayal Response Scale was evaluated against a measure that was not exclusively assessing betrayal trauma

Methodological limitations also extend to the development of the BRS. It is possible that the removal of items from the scale may have affected the factor structure of the model. However, all excluded items had poor coefficient values (less than .30) meaning that the inclusion would have likely affected the psychometric integrity of the measure. Nonetheless, re-evaluating participant responses to the two factor structure BRS within a clinical sample would be important for future research. Another limitation within the BRS is that the scale does not distinguish between types of betrayal event (i.e. sexual or physical abuse) nor does it assess for time since the betrayal event. Evidence suggests that survivors of high betrayal trauma are more likely to report a higher frequency of everyday betrayal events (Gobin & Freyd, 2009). The inability of the BRS to ascertain the timeframe and type of the betrayal event limits the reliability of the scale. Finally, the psychometric properties of the BRS are limited as the scale was not re-administered within a given sample following the process of exploratory factor analysis and systematic item reduction. Doing so prior to conducting the correlational analysis would have enhanced the validity and reliability of the scale.

Future research

One area for future research may be to assess the utility of the BRS subscales with a mixed methodological design. Integrating a qualitative approach into the study may allow for a better understanding of the multidimensional nature of betrayal responses. The population within which the study is conducted could also be expanded to include more male participants and clinical populations with diagnosed mental health conditions. It would be of additional benefit to verify the diagnosis of each participant by conducting a clinical interview with a qualified mental health practitioner. Administering the scale within a larger sample may also serve to establish the reliability and validity of the BRS.

Future research may benefit from the implementation of a validated measure such as the Davidson Trauma Scale (DTS, Davidson, Book, Colket et al. 1997) as a means to capture trauma appraisals. The DTS is known to have good sensitivity and excellent specificity in identifying intrusion, avoidance and hyperarousal in mixed trauma groups (Brewin, 2005). Trauma symptomatology has already been implicated as a moderating factor in revictimisation and may well be a missing variable unaccounted for within the scale.

Future research could also extend to investigating whether betrayal responses are vulnerable to changes over time. One potential area for future research could be to introduce additional items to the scale instructing participants to clarify the time since, and the type of betrayal event being assessed. Conducting a longitudinal study would also help to identify whether change does arise and if so, what the mediating factors contributing to this change may be. Finally, the correlational design of the study does not allow for the inference of causation regarding the direction of the

relationships between the variables. Future research could focus on replicating the current findings and assessing for causation amongst the variables.

Clinical implications

The findings of the present study provide evidence to suggest that individuals with pathological personality traits were more likely to have had experiences of high-betrayal events. In addition to this, individuals who have marked responses to betrayal events were more likely to experience psychosocial impairment. It is possible that these findings are particularly relevant to individuals with a diagnosed personality disorder as this population is more likely to have experiences of betrayal trauma and major interpersonal difficulties (Nakao, Gunderson, Phillips et al. 1992; Pincus & Wiggins, 1990).

Use of the BRS in clinical settings may help clinicians reliably assess for elevated levels of psychosocial impairment and negative emotions such as anger and hopelessness in response to betrayal events. The potential to utilise either the NIR or INE subscales can also support clinicians who wish to assess for specific symptomatology with their clients. High BRS scores can also be quickly interpreted to represent probable evidence of historical abuse or maltreatment. The presence of such difficulties would likely inform a treatment protocol that incorporates the development of prosocial skills and emotion regulation techniques. The clinician might also infer, from high BRS scores, whether the impact of betrayal events may manifest as interpersonal difficulties within the therapeutic relationship.

Implementing the recommendations discussed in this study could result in the refinement of the BRS as a useful psychometric measure for clinical practice within personality pathology populations.

Conclusions

The development of the BRS has multiple potential uses in the investigation of psychosocial impairment following betrayal trauma. Given the extensive evidence linking betrayal experiences with personality trait symptomatology, the BRS may serve as an important clinical tool assessing for a range of emotional and interpersonal betrayal responses within populations with personality pathology. Additionally, the BRS could be implemented as an outcome measure for interventions seeking to reduce psychosocial impairment.

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Part 3: Critical Appraisal

This critical appraisal seeks to reflect on the key issues that arose during the implementation of this research project. The methodological issues of gaining ethical consent from the NHS is discussed in relation to its influence on the time line of the project. The conceptual issues surrounding attempts to measure betrayal experiences are considered. Implications of the research for clinical practice and directions for future research.

Gaining ethical approval from NHS Research Ethics Committee

Having a strong interest in personality pathology, I was keen to work on a project that would allow me to contribute to research relevant to this population. The internal supervisor of the project had extensive links within NHS services commissioned to provide assessment and treatment to individuals with a diagnosis of a personality disorder. In the preliminary planning stages, it was agreed that recruitment would take place within a specialist Personality Disorder service. In order to recruit from this service, it was necessary to first obtain ethical approval from the NHS research committee and then attain approval from the relevant research and development (R&D) NHS divisions.

Local research ethics committees (REC) were formally established in 1991 by the Department of Health. The committee was instructed to include lay members to help facilitate the process of a full ethical review of the proposed research. The merits of a coherent and comprehensive ethical review system are undeniable, patient safety must be paramount when conducting research. Similarly, safeguards for potential liability and the need for ethical approval in order to receive funding or publish research within journals demands a comprehensive framework through which

research can be reviewed. Nonetheless there are multiple challenges and methodological barriers in gaining ethical approval such as procedural delays, inconsistencies between research committees and lengthy application processes (Hunter, 2008). These were some of the challenges I was confronted with during the application for ethical approval. The initial stages of the application involved completing a lengthy and extensive form on an online interface called the Integrated Research Application System (IRAS). The merit of IRAS was that it thoroughly assesses all details of the project such as the theoretical rationale for the study aims, study methodology and materials. However time constraints exist throughout the application process. There was a lengthy wait to receive feedback regarding the IRAS form, thus students must work swiftly to update any necessary amendments suggested once the IRAS form is submitted. Working swiftly ensures that there is a sufficient amount of time to gain favourable opinion from the REC, obtain R&D approval, undergo information governance training and then conduct the study in question.

In my experience the process was at times cumbersome and finding a research committee within the desired timeframe was a fraught process. The challenge for students to gain ethical approval has been acknowledged as onerous but necessary (Soteriou & Hek, 2013). I would echo this sentiment. The process of gaining ethical approval was difficult but does highlight the importance of conducting research that best serves the population it seeks to work with by developing research of a high quality that adheres to ethical guidance. In hindsight, I would encourage researchers who require ethical approval to construct a realistic time line that allows for possible delays as these are likely to arise.

Recruitment from personality disorder services

The research presented in the empirical paper sought to recruit individuals with personality pathology. This was conducted within a specialist service, I was able to attend two staff meetings to discuss the project at length, explain the rationale behind the research and receive feedback from the clinicians regarding the construction of the BRS. By attending these meetings I was able to build links with the staff and promote the study allowing for some success in recruitment. Whilst interest amongst the staff was high, the interest amongst the service users appeared muted. Given that the service supports c.450 service users a year, it was hoped that recruitment from such services would result in a larger sample of participants with personality pathology than 173 respondents. Although the project was able to successfully recruit the number of participants needed to allow for comprehensive statistical analysis, it is possible that by not asking respondents to report any known mental health diagnoses I may not have accurately captured the optimum proportion of personality pathology cases. However the design of the study meant that I could not verify or validate self-report diagnoses and so it was not deemed to be a reliably robust method to assess for pathology through such means.

As an alternative to capturing diagnoses through self-report, the methodology of the current study relied on the use of the Standardised Assessment of Personality–Abbreviated Scale (SAPAS; Moran, Leese, Lee et al. 2003) to screen for personality pathology. In the present study, 371 participants scored three or more on the SAPAS. However the threshold of the SAPAS score was set to four by the researchers to achieve the optimum levels of sensitivity and specificity from the scale leading to a final sample size of 173 participants. Research suggests that the point prevalence of personality disorders within North America and Europe is between 4% and 15%

(Tyrer, Reed & Crawford, 2015). The demographics of the present study show that 91.2% reported living in North America or West Europe and 3.9% of the total sample were found to have personality pathology (as measured by the SAPAS). The prevalence of personality pathology noted within the study sample is very close to the previously mentioned point prevalence. This suggests that the use of the SAPAS was appropriate for the study as it served as an effective screening tool for personality pathology.

There was also a noticeable attrition rate amongst participants with personality pathology, the population number would have risen from 173 to 240 were cases not excluded on account of missing data. The challenges of engaging individuals with severe and enduring mental health difficulties in research has been noted in literature (Howard, Salis, Tomlin, et al. 2009), symptom severity and management can be a significant barrier to engagement and may be in part an explanation for the moderate number of personality pathology cases. Recruiting participants to a study in a more general sense is known to have its challenges, Patel, Doku & Tennakoon (2003) noted multiple factors that result in adverse effects on participant response rates such as the use of lengthy questionnaires and an undesirable experimental designs. The use of lengthy questionnaires was particularly pertinent to the empirical study conducted. Given that the study was implemented in partnership with another trainee, there were a number of psychometric scales included in the study. The use of nine questionnaires demanded at least 35 minutes of a participant's time to complete. The demands on the participant to complete all questionnaires in one sitting is a noticeable limitation on the study and likely contributed to the modest attrition rate. To accommodate for this, a charity donation was used to incentivise participation and completion of the study. However this type

of incentive may be of limited success as it was dependent on the participant having altruistic intent given there was no direct financial (or alternative) incentive. One must also consider that some of the questions may have had an emotional impact on the respondent. To reduce this, distress tolerance skills were accessible as part of the study. Additionally, participants were informed prior to providing their consent to start the study that some of the questions may have an emotional impact. This was done to ensure that the respondents were able to make an informed decision about taking part in the study.

One important consideration for future research is to appropriately anticipate and manage the potential distress caused by self-report measures.

A noticeable methodological strength of the study that most certainly contributed to satisfactory recruitment was the implementation of an extensive social media campaign. The campaign involved making contact with third sector organisations offering emotional support to individuals with a personality disorder, and other mental health diagnoses, such as Emergence and MIND, to promote the study. It also proved helpful to link in with relevant online societies (i.e. 'Borderline Brave', 'Battling BPD' and BPD Planet') and mental health campaigners such as Kat Cormack and MP Norman Lamb to help promote the project through Twitter. Twitter in particular helped to reignite interest in the study following noticeable lulls in response rates. Future research would benefit from adopting these recruitment strategies.

Self-report measures

The methodology of the empirical paper relies solely on the use of self-report measures. Self-report measures are common tools used across multiple fields of empirical research. This was likely due to the fact that measures are relatively inexpensive, can be time efficient and do not usually require sophisticated or complicated methodology to implement. In the case of the empirical study presented, hosting the self-report measures online resulted in minimal expenditure and maximised the reach of the project. For instance, a proportion of the participants in the study reported living in North America (36.6%), Asia (1.9%) and North Africa (0.5%). Were it not for the use of the internet, it is unlikely the research project would have been able to reach these regions. The ability to target hard to reach populations is a noticeable advantage of online research (Barry, Elliott & Evans, 2000, cited by, Barker, Pistrang & Elliott, 2002).

That notwithstanding, there are multiple limitations to adopting a self-report methodology. One being vulnerability to response biases. Measures are thought to be vulnerable to response bias in two ways, response set bias and response style bias (Weijters, 2006, cited in, Van Sonderen, Sanderman & Coyne, 2013). The former refers to a biased response relating to the given content of the items whilst the latter refers to respondents answering items regardless of the content. Reverse items were included into the betrayal response scale (BRS) to help maintain the validity of the scale by accounting for the threat of response bias. Whilst the inclusion of reverse items is common when constructing psychometric measures, the effectiveness of this approach has been questioned (Paulhus & Vazire, 2009; Van Sonderen, Sanderman & Coyne, 2013). The researchers propose that the inclusion of reverse items does not effectively resolve response bias difficulties and may likely confuse respondents.

Furthermore, it is suggested that psychometric scales with reverse items were still vulnerable to the effects of inattention and misinterpretation (Van Sonderen, Sanderman & Coyne, 2013). Another disadvantage to consider was the cultural limitation of using a series of psychometric scales written in English. Whilst I was keen to include measures of varying languages, particularly as the specialist personality disorder service covers an array of diverse boroughs, it was not possible to obtain validated versions of the measures in other languages. Not only does this limit the cultural diversity of the final group of respondents, it also assumes cultural homogeneity amongst the participants. Respondents are thought to evaluate their behaviour and emotional responses relative to the cultural group they identify with (Paulhus & Vazire, 2009) and no linguistic or cross cultural adaptations were made to accommodate for this. Arguably any amendments made to the scale would have negative implications for its validity but not doing so leaves the self-report measures vulnerable to multiple misinterpretations by participants. One must also consider the fact that implicit processes such as memory and cognitive processing are known to influence the quality of responses in self-report measures. For instance, research has identified that self-reports relating to emotions are vulnerable to discrepancies if the respondent has to recall events relevant to a particular time frame in their life (Tourangeau, 2009). This was particularly relevant given that the BRS assesses for emotional responses to betrayal events.

It was also important to acknowledge concerns relating to the use of self-report measures as an assessment of personality disorder. The SAPAS was used to indicate the presence of personality pathology. The SAPAS has been shown to be a valid screening tool for personality disorders across psychiatric and community samples (Germans, Van Heck, Moran et al. 2008; Germans, Van Heck &

Hodiamont, 2012; Pluck, Sirdifield, Brooker, et al. 2012). That being said, throughout the research process (particularly at the planning stages and whilst gaining ethical approval) it was made clear that the SAPAS was not considered a sufficient tool to assess for, or diagnose a personality disorder, the SAPAS was used solely as a screening tool. Whilst the validity of the SAPAS is reportedly robust, empirical evidence states that the use of self-report measures to assess for personality pathology can be inaccurate due to confounding variables such as mood state, symptom severity and potential insight bias (Huprich, Bornstein, & Schmitt, 2011). These inaccuracies are thought to lead to an overestimation of the presence of personality pathology (Hopwood, Morey, Edelen, et al. 2008). Bearing this literature in mind, one cannot rule out that the numbers of participants interpreted as possessing personality pathology in the present study may be smaller than reported.

A multimodal method (i.e. assessments conducted by clinicians, informant reports etc.) is recognised by Huprich, Bornstein, & Schmitt (2011) to be the most accurate approach to assess for personality diagnoses. Similarly, Hopwood, Morey, Edelen, et al. (2008) recommend the combined use of interview and self-report measures as a means to assess for BPD. As such, future studies may be best served to combine clinician rated and self-report measures alongside interviews with participants as a means to assess for pathology. One must bear in mind however that this suggestion is more relevant to research which focuses specifically on clinical populations. The aim of the current empirical paper was to develop a psychometric scale, the first step of which was to get a sufficient data set to allow for statistical analysis. This was achieved and has allowed for the development of a pioneering measure of betrayal responses.

The construct of betrayal

The empirical paper attempts to accurately measure the impact of betrayal which is defined as “a sense of being harmed by the intentional actions, or omissions, of a person who was assumed to be a trusted and loyal friend, relative, partner, colleague or companion” (Rachman, 2010). In an attempt to refine the broad and multifaceted nature of the definition, separate focus groups were conducted with clinical staff and service users within a specialist personality disorder service. The definition of betrayal given by the client group was not dissimilar to that proposed by the aforementioned researcher. Clients identified intense emotional, cognitive and behavioural responses following betrayal e.g. a sense of abandonment, making attempts to get revenge, feelings of anger, despair and hopelessness. Similar to Freyd’s (1996, 2001) definition of betrayal, clients named institutions as well as individuals to be perpetrators of betrayal. Following on from the focus groups and additional consultation with clinicians, an attempt was made to construct a psychometric measure of betrayal responses. In the final stages of analysis, exploratory factor analysis was conducted to reduce the measure to its most salient factors. Thus allowing for a succinct clinical measure to be developed. It is possible however that by refining the measure the complexity and multifaceted nature of the construct may have been compromised.

It was also possible that the use of the word betrayal holds multiple meanings for a participant depending on factors such as life experiences, suspected psychopathology or mood state. For instance some respondent’s definition of betrayal may fit more closely with Rachman’s (2010) definition of betrayal which focuses solely on interpersonal relationships whilst other respondents may align more closely with Freyd’s definition (1996, 2001) which extends to institutions as potential

perpetrators of betrayal. Though subtle this difference has implications for the use of the BRS. Currently the BRS is based on the interpersonal nature of betrayal, this has the potential to exclude betrayal responses related specifically to institutions. Similarly, the scale does not distinguish between the types of betrayal event the respondent was using as a reference point whilst completing the questionnaire. Moreover, the current version of the scale does not have the ability to decipher whether the respondent is considering multiple, or a single, betrayal event. Given that one key finding of the empirical paper was that people with personality pathology were significantly more likely to experience 'high' betrayal events as measured by the Brief Betrayal Trauma Survey- (BBTS; Goldberg & Freyd, 2006), it may be important to capture the type of betrayal event within the BRS to improve the integrity and reliability of the scale.

Conclusions and recommendations

The presenting critical appraisal embodies some reflections relating to the process of conducting research aimed at developing a psychometric betrayal responses scale amongst individuals with personality pathology. Limitations relating to the methodology and psychometric scale development have been discussed alongside the noticeable strengths and important considerations made during the research process. It could prove particularly fruitful for future researchers to consider the challenges of defining the construct of betrayal given there is dearth of published literature on the construct. One potential solution could be to incorporate a semi-structured interview into future studies as a means to gain an understanding of the respondent's definition of betrayal. This would also ensure that the research is not dependent on self-report measures, a noted limitation of the present study. Another

recommendation for future research would be to conduct research within a clinical sample. This could serve to validate the BRS and the findings discussed within the empirical paper. To limit the attrition rate of the study, future researchers may wish to consider conducting a study that is not lengthy or demanding for the respondents. Should future research be conducted in this area, it would contribute to the growing interest on betrayal and psychopathology.

In light of this research, it is possible that clinicians may be able to inform treatment protocols for service users with personality pathology. A key finding of the empirical paper was the significant relationship between the BRS and all subscales of the IIP-PD (Pilkonis, Kim, Proietti et al, 1996). The effect sizes of these relationships ranged from medium to large indicating some sensitivity within the BRS to assess for aggression, sensitivity, ambivalence, approval seeking and lack of sociability within interpersonal relationships. Therefore, were the BRS to be used in clinical practice, clinicians would be able to quickly assess for interpersonal difficulties and incorporate interventions such as emotion regulation training, assertiveness and prosocial skills training to ameliorate the impact of betrayal experiences. These interventions may also reduce the probability of future interpersonal difficulties. Currently, interventions such as emotion regulation training are frequently used in treatment protocols for personality disorders, particularly BPD (Linehan, 1993). This overlap goes some way to reinforce the clinical utility of the BRS.

Moreover, significant correlations between the subscales of the BRS suggest that clinicians may not need to use the full scale should they wish to assess for specific symptomatology. The results of the empirical study seem to suggest that the negative

interpersonal responses subscale may more sensitively assess for aggression and ambivalence within interpersonal relationships. Similarly, the internalised negative emotion subscale may be most sensitive in its assessment of approval seeking within interpersonal relationships and internalised negative emotions amongst individuals with personality trait pathology.

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Appendices

Appendix A: Appraisal Study criteria and scores from Raters

Qualsyst criteria assessing the quality of quantitative papers

Item	
1	Question / objective sufficiently described?
2	Study design evident and appropriate?
3	Method of subject/comparison group selection or source of information/ input variables described and appropriate?
4	Subject (and comparison group, if applicable) characteristics sufficiently described?
8	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?
9	Sample size appropriate?
10	Analytic methods described/justified and appropriate?
11	Some estimate of variance is reported for the main results?
12	Controlled for confounding?
13	Results reported in sufficient detail?
14	Conclusions supported by the results?

Qualsyst criteria assessing the quality of qualitative papers

Item	
1	Question / objective sufficiently described?
2	Study design evident and appropriate?
3	Context for the study clear?
4	Connection to a theoretical framework / wider body of knowledge?
5	Sampling strategy described, relevant and justified?
6	Data collection methods clearly described and systematic?
7	Data analysis clearly described and systematic?
8	Use of verification procedure(s) to establish credibility?
9	Conclusions supported by the results?
10	Reflexivity of the account?

Appraisal scores of Rater 1

Authors	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 8	Criteria 9	Criteria 10	Criteria 11	Criteria 12	Criteria 13	Criteria 14	Total
Fergus & Bardeen 2015	2	2	1	2	1	1	2	0	1	2	2	0.73
Fergus 2014	1	1	2	0	1	2	2	0	1	1	2	0.59
Herba & Rachman 2007	2	1	1	1	2	2	2	2	2	2	1	0.81
Ishikawa et al. 2015	2	1	1	1	2	1	2	1	0	2	1	0.64
Lee et al. 2013	2	2	1	1	2	1	2	1	1	2	1	0.73
Melli et al. 2014	2	1	1	1	2	1	2	2	1	2	2	0.77
Okatunji et al. 2008	2	2	1	1	2	1	2	1	2	2	2	0.81
Rachman et al. 2012	2	2	1	1	2	1	2	1	1	2	1	0.73
Radomsky & Elliott 2009	2	1	1	1	2	1	2	1	1	2	2	0.73
Radomsky & Elliott 2013	2	2	1	1	2	1	2	2	2	2	2	0.86
Travis & Fergus 2015	2	1	1	1	2	2	2	1	1	2	2	0.77
Waller & Boschen 2015	2	2	1	1	1	1	2	2	1	2	2	0.77

Appraisal scores of Rater 2

Authors	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 8	Criteria 9	Criteria 10	Criteria 11	Criteria 12	Criteria 13	Criteria 14	Total
Adams et al. 2014	2	1	2	1	2	2	2	2	2	2	2	0.91
Bardour et al. 2014	2	2	2	2	2	1	2	2	0	2	2	0.86
Carraresi et al. 2014	2	2	1	1	2	2	2	2	2	2	2	0.91
Cogle et al. (2008)	1	2	1	2	1	2	2	0	1	2	2	0.73
Elliott & Radomsky 2009	2	2	1	1	2	1	2	1	1	2	2	0.77
Fergus 2014	1	1	1	0	1	1	2	0	1	1	2	0.5
Herba & Rachman 2007	1	1	1	1	2	1	2	2	2	2	2	0.77
Ishikawa et al. 2015	2	2	1	2	1	2	2	1	2	2	2	0.86
Melli et al. 2014	2	1	2	2	2	2	2	2	1	2	2	0.91
Olatunji et al. 2008	2	2	1	1	2	2	2	2	1	2	2	0.86
Radomsky & Elliott 2009	2	1	1	1	2	2	2	1	2	2	2	0.81
Waller & Boschen 2015	2	2	1	1	2	2	2	2	1	2	2	0.86

Appendix A2: Appraisal Summary Scores

Qualsyst appraisal summary score for quantitative studies

Study (In publication order)	Rater 1 score	Rater 2 Score	Difference in score value
Waller & Boschen (2015)	0.77	0.86	0.09
Travis & Fergus (2015)	0.77		
Ishikawa, Kobori & Shimizu.(2015)	0.64	0.86	0.22
Fergus & Bardeen (2015)	0.73		
Coughtrey, Sharfran & Rachman (2015)	0.73		
Badour, Feldner, Blumethal et al. (2014)	0.72	0.86	0.14
Melli, Bulli, Carraresi.(2014)	0.77	0.91	0.14
Adams, Badour, Cisler et al. (2014)	0.86	0.91	0.05
Fergus (2014)	0.59	0.50	0.09

Study (In publication order)	Rater 1 score	Rater 2 Score	Difference in score value
Coughtrey, Sharfran & Rachman (2014)	0.68		
Carraresi, Bulli, Melli et al. (2014)	0.95	0.91	0.04
Coughtrey, Shafran & Rachman.(2013)	0.68		
Badour, Feldner, Blumethal et al. (2013)	0.91		
Radomsky & Elliott (2013)	0.86		
Lee, Shafran, Burgess et al. (2013)	0.73		
Rachman, Radomsky, Elliott et al.(2012)	0.73		
Coughtrey, Shafran, Knibbs et al.(2012)	0.77		
Elliott & Radomsky (2012)	0.81		

Study (In publication order)	Rater 1 score	Rater 2 Score	Difference in score value
Elliott & Radomsky (2009)	0.73	0.81	0.08
Elliott & Radomsky (2009)	0.77	0.77	0
Olatunji, Elwood, Williams et al.(2008)	0.81	0.86	0.05
Herba & Rachman (2007)	0.81	0.77	0.04
Fairbrother, Newth & Rachman.(2005)	0.73		

Table 3. Qalsyst appraisal summary score for qualitative studies

Study	Rater 1 score	Rater 2 score	Difference in score
Coughtrey, Shafran & Lee.(2012)	0.70		

Appendix B: Confirmation of ethical approval

East Midlands - Nottingham 2 Research Ethics Committee

Royal Standard Place
Nottingham
NG1 6FS

Telephone: [REDACTED]

26 October 2015

Dr Janet Feigenbaum

Department of Clinical, Educational and Health Psychology UCL, Gower Street

London

WC1E 6BT

Dear Dr Feigenbaum

Study title:	The development and validation of a psychometric betrayal scale for people with personality disorders
REC reference:	15/EM/0431
Protocol number:	3
IRAS project ID:	172924

Thank you for your letter of 13 October 2015, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Assistant, Joanne Unsworth, [REDACTED].

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett [REDACTED], the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Copies of advertisement materials for research participants [Project poster]	3	10 August 2015
Covering letter on headed paper [cover letter]	1	02 September 2015
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [insurance certificate]	1	10 August 2015
GP/consultant information sheets or letters [therapist guidance sheet]	1	10 September 2015
Letter from sponsor [letter from sponsor]	1	10 August 2015
Non-validated questionnaire [New Betrayal Scale]	Version 2	10 September 2015
Non-validated questionnaire [Demographic information]	2	10 August 2015
Non-validated questionnaire [New Betrayal Scale]	3	08 October 2015
Other [summary CV for student]	1	27 August 2015
Other [Debriefing sheet]	2	10 August 2015
Other [Online Recruitment Page]	1	09 October 2015
Other [Debriefing sheet]	2	10 October 2015
Other [REC written response]		12 October 2015
Participant consent form [participant consent form]		
Participant information sheet (PIS) [Participant information sheet]	version 5	10 August 2015
Participant information sheet (PIS) [Participant information sheet]	6	12 October 2015
REC Application Form [REC_Form_11092015]		11 September 2015
Referee's report or other scientific critique report [Peer review form]	1	10 August 2015
Research protocol or project proposal [project proposal]	Version 4	10 September 2015
Research protocol or project proposal [project proposal]	5	12 October 2015
Summary CV for Chief Investigator (CI) [chief investigator CV]	1	10 August 2015
Summary CV for student [CV for Kemi]	1	10 August 2015
Summary, synopsis or diagram (flowchart) of protocol in non technical language [study flow chart]	2	10 September 2015

Validated questionnaire [Brief Betrayal Trauma Scale]	1	10 September 2015
Validated questionnaire [PHQ9]	1	10 September 2015
Validated questionnaire [SAPAS]		10 September 2015
Validated questionnaire [GAD7]	1	10 September 2015
Validated questionnaire [IIP-PD]	1	10 September 2015
Validated questionnaire [Social Functioning Questionnaire]	1	10 September 2015
Validated questionnaire [Hopelessness Scale]	1	10 September 2015
Validated questionnaire [Clinical Anger Scale]	1	10 September 2015

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review Reporting requirements

The attached document “*After ethical review – guidance for researchers*” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:

<http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

15/EM/0431

Please quote this number on all correspondence

With the Committee's best wishes for the success of this project. Yours sincerely


pp.

Professor Frances Game Chair



Copy to:

Mr David Wilson

Mr Kiran Azam, Research & Development

Appendix C: Standardised assessment of Personality: Abbreviated Scale

Standardised Assessment of Personality – Abbreviated Scale

Please read the statement below and select either option Yes or No.

Item		Yes	No
1	In general, do you have difficulty making and keeping friends?		
2	Would you normally describe yourself as a loner?		
3	In general, do you trust other people?		
4	Do you normally lose your temper easily?		
5	Are you normally an impulsive sort of person?		
6	Are you normally a worrier?		
7	In general, do you depend on others a lot?		
8	In general, are you a perfectionist?		

Appendix D: Inventory of Interpersonal problems for patients with personality disorders

Inventory of Interpersonal Problems- PD

Please read the statement below and rate how well the statement applies to you. 0= Not at all- 4= Extremely.

Item		0	1	2	3	4
1	I am too sensitive to rejection.					
2	I am too sensitive to criticism.					
3	It is hard for me to ignore criticism from other people.					
4	I feel too anxious when I am involved with another person.					
5	I feel attacked by other people too much.					
6	It is hard for me to get over the feeling of loss after a relationship has ended.					
7	I am too envious and jealous of other people					
8	It is hard for me to trust other people.					
9	It is hard for me to feel like a separate person when I am in a relationship.					
10	I am too easily bothered by other people making demands on me.					
11	I tell personal things to other people too much.					
12	It is hard for me to take instructions from people who have authority over me.					
13	It is hard for me to accept another person's authority over me.					
14	It is hard for me to get along with people who have authority over me.					

15	It is hard for me to be supportive of another person's goals in life.					
16	It is hard for me to really care about other people's problems.					
17	It is hard for me to feel good about another person's happiness.					
18	It is hard for me to put somebody else's needs before my own.					
19	It is hard for me to do what another person wants me to do.					
20	It is hard for me to maintain a working relationship with someone I don't like.					
21	I feel competitive even when the situation does not call for it.					
22	I argue with other people too much.					
23	I lose my temper too easily.					
24	I fight with other people too much.					
25	I am too aggressive toward other people.					
26	I get irritated or annoyed too easily.					
27	I criticise other people too much.					
28	I want to get revenge against people too much.					
29	I try to please other people too much.					
30	I worry too much about disappointing other people.					
31	It is hard for me to say no to other people.					
32	I am influenced too much by another person's thoughts and feelings.					

33	I worry too much about other people's reactions to me.					
34	I want to get revenge against people too much.					
35	It is hard for me to be assertive without worrying about hurting the other person's feelings.					
36	It is hard for me to make reasonable demands of other people.					
37	It is hard for me to be assertive with another person.					
38	It is hard for me to socialise with other people.					
39	It is hard for me to feel comfortable around other people.					
40	It is hard for me to join in on groups.					
41	It is hard for me to be self-confident when I am with other people.					
42	It is hard for me to introduce myself to new people.					
43	It is hard for me to ask other people to get together socially with me.					
44	It is hard for me to express my feelings to other people directly.					
45	I am too afraid of other people.					
46	I feel embarrassed in front of other people too much.					
47	It is hard for me to set goals for myself without other people's advice.					

Appendix E: Brief Betrayal-Trauma Survey

Brief Betrayal Trauma Survey

Please read the statement below and select the relevant option to rate your experiences before and after age 18.

0= Never, 1= 1 or two times, 2=More than that.

Item		Before 18 years old	After 18 years old
1	Been in a major earthquake, fire, flood, hurricane, or tornado that resulted in significant loss of personal property, serious injury to yourself or a significant other, the death of a significant other, or the fear of your own death.		
2	Been in a major automobile, boat, motorcycle, plane, train, or industrial accident that resulted in similar consequences.		
3	Witnessed someone with whom you were very close (such as a parent, brother or sister, caretaker, or intimate partner) committing suicide, being killed, or being injured by another person so severely as to result in marks, bruises, burns, blood, or broken bones. This might include a close friend in combat.		
4	Witnessed someone with whom you were not so close undergoing a similar kind of traumatic event.		
5	Witnessed someone with whom you were very close deliberately attack another family member so severely as to result in marks, bruises, blood, broken bones, or broken teeth.		
6	You were deliberately attacked that severely by someone with whom you were very close.		

7	You were deliberately attacked that severely by someone with whom you were not close.		
8	You were made to have some form of sexual contact, such as touching or penetration, by someone with whom you were very close (such as a parent or lover).		
9	You were made to have such sexual contact by someone with whom you were not close.		
10	You were emotionally or psychologically mistreated over a significant period of time by someone with whom you were very close (such as a parent or lover).		
11	Experienced the death of one of your own children.		
12	Experienced a seriously traumatic event not already covered in any of these questions.		

Appendix F: The Social Functioning Questionnaire

Social Functioning Scale

Please read the statement below and rate how well the statement applies to you. 0= Not at all, 1= Sometimes, 2= Quite Often, 3= Most of the Time

Item		Rating
1	I complete my tasks at work and home satisfactorily.	
2	I find my tasks at work and at home very stressful	
3	I have no money problems.	
4	I have difficulties in getting and keeping close relationships.	
5	I have problems in my sex life.	
6	I get on well with my family and other relatives.	
7	I feel lonely and isolated from other people.	
8	I enjoy my spare time.	

Appendix G: Betrayal Responses Scale

Betrayal Responses Scale

Please read the statement below and rate how well the statement applies to you. 0= Strongly Disagree, 1= Slightly Disagree, 2= Neither Agree nor Disagree, 3= Slightly Agree and 4= Strongly Agree.

Item		Rating
1	I am sensitive to people possibly betraying me.	
2	If someone breaks my trust I am able to ignore what has happened.	
3	It is hard for me to trust someone again if they have already betrayed me.	
4	In any relationship I have I expect to be betrayed.	
5	I have betrayed someone's trust before.	
6	I think about getting revenge of people who have betrayed me.	
7	If someone has betrayed me I find it difficult to express my feelings directly to them.	
8	If someone betrays me I cannot stop thinking about it.	
9	If someone betrays me I never wonder about why it happened to me.	
10	If someone betrays you, they are doing it on purpose.	
11	If someone betrays you it means they think you are not good enough.	
12	I feel despair when someone betrays me.	

13	I feel out of control when someone betrays me	
14	I feel empty when someone betrays me.	
15	I feel worthless when someone betrays me.	
16	I never feel angry towards the person I think has betrayed me.	
17	I feel angry towards myself when I think someone has betrayed me.	
18	I feel hopeless when someone betrays me.	
19	I feel rejected when someone betrays me.	
20	I feel abandoned when someone betrays me.	
21	If I feel distressed when someone betrays me, the emotions grow stronger with time.	
22	When someone betrays me, I have difficulty falling asleep/ staying asleep.	
23	It feels as though my stomach is in knots when someone betrays me.	
24	When someone betrays me I am able to confront the person.	
25	When someone betrays me, I feel so angry that I want to physically hurt them.	
26	In my relationship I do not have high expectations of others (friendships, family, romantic partners).	
27	When someone betrays me, I hold a grudge for a very long time.	
28	When someone betrays me, it makes me think "what is wrong with me?"	
29	I am able to trust others easily despite being betrayed in the past.	

Appendix H: Focus group themes

Key points from client focus group

Concept	Respondents
Definition of Betrayal	Emphasised that this may differ between people but felt a sense of abandonment, a breach of trust and unmet expectations were central concepts. Betrayal events were thought to occur frequently.
Role of Betrayer	There is an explicit intention to harm. In many instances the relationship is irreparable though not impossible.
Emotional consequences	Strong sense of anger, emotional pain, bitterness, sadness, hopelessness and despair.
Cognitive Consequences	Rumination, preoccupation with fantasies of revenge or repair of the relationship, negative self-attribution, a sense of paranoia about the maliciousness of the betrayer.
Physiological Consequences	Nausea, knot in stomach, poor sleep, surge of energy.
Therapeutic Implications	A desire to discuss this explicitly in psychological therapy sessions. Respondents suggested that strategies aimed at understanding the occurrence of betrayal may help to alleviate the distress it causes.

Key points from staff focus group

Concept	Respondents
Observed emotional consequences	Rage, anger, fear, hopelessness, helplessness and sadness. A sense of emotional dysregulation.
Observed cognitive Consequences	Clinicians noticed a tendency for clients to think in a very dichotomous manner about the betrayer. A sense of preoccupation by the client was noticed once a betrayal event had arisen was noted. Moreover, some clinicians experienced the event as therapy interfering and as such needed to address the issue before clinical work could progress.
Therapeutic Implications	Respondents suggested that the interpretation of betrayal event may link to a sense of vulnerability and negative self-appraisals.

Appendix I: Participant Information Sheet

Participant Information Sheet

Study Title: The emotional, cognitive and behavioural impact of betrayal in relationships.

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Please read the information on this sheet carefully before deciding whether you would like to take part.

Part 1 of the information sheet

What is the purpose of the study?

In this research we are trying to understand how a person reacts after they have been betrayed. In particular we are interested in how a person feels, the thoughts they have and how they behave.

Why have I been invited?

We are inviting all adult members of the public to take part in this study, via social media sites and paper flyers. We estimate that over 200 participants will take part in this study.

Do I have to take part?

It is up to you to decide to join the study. If you agree to take part, we will then ask you to give your consent to take part. You are free to withdraw at any time, without giving a reason. If you complete the questionnaires then this will mean that you are agreeing to take part in the study.

What will happen to me if I take part?

If you decide to take part in this study we will ask you to complete a series of questionnaires. We will ask you to reflect on times you believe you have been betrayed but we will not ask you to describe the event in detail. The questions will focus on how you felt, what you thought and how you behaved after being betrayed. Altogether the questionnaires may take up to 40 minutes to complete but you make complete them more quickly than this. A 'Participant Debrief Sheet' is available on this website (or at the back of the paper packet) if at any time you feel distressed and would like some support for your distress or would like some suggestions of how to manage your distress. This will encourage you to manage any difficult thoughts or feelings you might have after completing the questionnaires. It will also signpost you to where you can access additional support if you need to. Once you have completed the questionnaires and read the debrief sheet we will not require any further participation from you.

Your participation in this study will be anonymous as will not ask for your name or any other information that can be used to identify you.

What will I have to do?

If you decide to take part, we would recommend that you to find a quiet space to complete the questionnaires.

What are the possible disadvantages of taking part?

We will be asking you to remember times when you have felt betrayed and this may cause you to experience difficult emotions. However, you are able to withdraw from the study at any time. The Participant Debrief Sheet will provide a number of strategies to support you to manage any difficult emotions. We will also signpost you to where you can access further support.

What are the possible benefits of taking part?

There are not likely to be any benefits to you personally from taking part in the study. The results of this study will help improve the understanding and treatment of those who experience long-term difficulties after experiencing betrayal in a relationship. Once you have completed the survey, you will also be able to choose which charity you would like us to make a £1 donation to on your behalf. The charities to choose from are MIND (a mental health charity based in the UK), Emergence (Emergence is a service user-led organisation supporting all people affected by personality disorder through support, advice and education) or Relate (an organisation offering information, support and counselling to individuals with relationship difficulties).

What happens when the research study stops?

The results of the research study will be written up as part of the researchers' theses for the Clinical Psychology Doctorate at University College London (UCL), a university in central London. The report of the study could also be published in relevant scientific journals. As mentioned, you will not be identifiable from these results.

If you would like to see the results of the study or assist us with making sense of the results once they are collected, we will be holding an open meeting in March 2016 to share the results and ask for feedback. You may call the IMPART (Intensive treatment of personality disorders assessment and recovery teams), a psychological therapy service for individuals with personality disorders, number on 0300 555 1213 from January 2016 to find out the date, time, and location of this meeting. The likely location will be Goodmayes Hospital in Ilford (East London).

Will my information be kept confidential?

Yes. We follow ethical and legal practice and all information about you will be handled in confidence. The data from this study will be stored in accordance with the University College London and NHS Data Protection and Records Management policies.

The online database will be password protected. Only the current researchers and chief investigators will have access to this password. The online database will be kept for up to 20 years.

What if there is a problem?

Any complaints about the way you have been dealt with during the study or any possible harm you might suffer will be taken seriously. The detailed information on this is given in Part 2.

Part 2 of the information sheet

What will happen if I don't want to carry on with this study?

You have the right to withdraw from the study at any time. However, as the data you provide will be anonymous it will not be possible for us to identify and remove your data specifically from our research.

Who is organising and funding the research?

The research has been organised by Kemi Komolafe and Rakhi Shah, Trainee Clinical Psychologists. They are conducting this study as part of their Clinical Psychology Doctorates. The research will be funded by University College London.

Who has reviewed this study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by Nottingham Research Ethics Committee.

What if there is a problem or something goes wrong?

If you have a concern about any aspect of this study, you should ask to speak to the research supervisor, Dr Janet Feigenbaum (Strategic and Clinical Lead for Personality Disorder Services, North East London NHS Foundation Trust and Senior Lecturer, Research Department of Clinical, Educational and Health Psychology, University College London) on [REDACTED] or by email at [REDACTED].

Contact Details of Researchers

If you wish to contact us to discuss any of the information further or any concerns you have about the study, then please do so by ringing [REDACTED] or sending us an email at [REDACTED].

Consent

By clicking 'continue', you confirm that you have understood the information provided above and consent to take part in the study. Do you wish to proceed? If so, please click 'continue'. If you decide not to participate please click 'finish'.

Appendix J: Participant Consent Sheet

Participant Consent Form

Researchers: Kemi Komolafe and Rakhi Shah

The emotional, cognitive and behavioural impact of betrayal experiences in relationships.

Please complete this sheet **after** reading the information sheet for this study.

Please enter today's date(DD/MM/YYYY)

	Please read each of the following 5 statements carefully. If you agree with it, please tick the box to the right of each statement.	Please tick
1	I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to think about the information provided. If I had questions, these have been answered to my satisfaction by a member of the research study.	
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.	
3	I understand that if I withdraw from the study after clicking 'finish' or posting my questionnaires, that all of the information I have provided will still be used in the study as there is no way for the researchers to know which data was mine.	
4	I understand In accordance with current UCL Records Management Policy, the anonymous data will be stored by UCL for 15 years after the research has finished. The UCL Records Office maintains archived records on a safe and secure site.	
5	I understand that the information that I provide will be included in the researchers' doctoral theses and will likely be published in a scientific journal. I understand that all information included will be fully anonymised to protect everyone's identity. As no personal information is collected, there is no possibility of personal information being disclosed.	
6	I give my consent to take part in the above study. Your consent is provided by clicking 'consent' below on the website or by posting the stamped addressed envelope with your completed questionnaires.	

Appendix K: Participant Distress Tolerance Skill Sheet

Debriefing Information Sheet

Thank you for agreeing to participate in this study. This research aims to understand the cognitive, emotional and behavioural impact of betrayal for people with a personality disorder in order to inform treatment and interventions.

You were asked to reflect on your own experienced of betrayal when answering the questions. If you are experiencing any difficult emotions due to your participation in this study please consider the following suggestions to help manage the distress. See examples of each at the end of this sheet.

Relaxed Breathing

Deep muscle relaxation

Distraction

Visualisation

Mindfulness

Contacts for further support

If you want feel you would like to speak to someone about the way you feel you can call the **Samaritans** on **08457 90 90 90** or visit their website at <http://www.samaritans.org/>. They provide a confidential listening service.

If you are currently under the care of a mental health team you might find it helpful to contact your key worker.

If you don't feel you have received adequate support from the above services, you can contact the chief investigator of this project for support, Dr. Janet Feigenbaum on [REDACTED] during office hours.

If you feel that we have not addressed your questions adequately or if you have any concerns about our conduct, then please contact our supervisor Dr. Janet Feigenbaum (Strategic and Clinical Lead for Personality Disorder Services, North East London NHS Foundation Trust and Senior Lecturer, Research Department of Clinical, Educational and Health Psychology, UCL) on [REDACTED] or by email at [REDACTED].

Relaxed Breathing

Practise deep breathing in a quiet place where you won't be disturbed. Loosen or remove any tight clothes you have on, such as shoes or jackets. Make yourself feel completely comfortable.

Sit in a comfy chair which supports your head or lie on the floor or a bed. Place your arms on the chair arms, or flat on the floor or bed, a little bit away from the side of your body with the palms up. If you're lying down, stretch out your legs, keeping them hip-width apart or slightly wider. If you're sitting in a chair, don't cross your legs.

Good relaxation always starts with focusing on your breathing. The way to do it is to breathe in and out slowly and in a regular rhythm as this will help you to calm down.

- Fill up the whole of your lungs with air, without forcing. Imagine you're filling up a bottle, so that your lungs fill from the bottom.
- Breathe in through your nose and out through your mouth.
- Breathe in slowly and regularly counting from one to five (don't worry if you can't reach five at first).
- Then let the breath escape slowly, counting from one to five.
- Keep doing this until you feel calm.
- Breathe without pausing or holding your breath.

Practice this relaxed breathing for three to five minutes, or until you feel calmer.

Deep muscle relaxation

This technique takes around 20 minutes. It stretches different muscles in turn and then relaxes them, to release tension from the body and relax your mind.

Find a warm, quiet place with no distractions. Get completely comfortable, either sitting or lying down. Close your eyes and begin by focusing on your breathing; breathing slowly and deeply, as described above.

If you have pain in certain muscles, or if there are muscles that you find it difficult to focus on, spend more time on relaxing other parts.

You may want to play some soothing music to help relaxation. As with all relaxation techniques, deep muscle relaxation will require a bit of practice before you start feeling its benefits.

For each exercise, hold the stretch for a few seconds, then relax. Repeat it a couple of times. It's useful to keep to the same order as you work through the muscle groups:

- **Face:** push the eyebrows together, as though frowning, then release.
- **Neck:** gently tilt the head forwards, pushing chin down towards chest, then slowly lift again.
- **Shoulders:** pull them up towards the ears (shrug), then relax them down towards the feet.
- **Chest:** breathe slowly and deeply into the diaphragm (below your bottom rib) so that you're using the whole of the lungs. Then breathe slowly out, allowing the belly to deflate as all the air is exhaled.
- **Arms:** stretch the arms away from the body, reach, then relax.
- **Legs:** push the toes away from the body, then pull them towards body, then relax.
- **Wrists and hands:** stretch the wrist by pulling the hand up towards you, and stretch out the fingers and thumbs, then relax.

Spend some time lying quietly after your relaxation with your eyes closed. When you feel ready, stretch and get up slowly.

Distraction

Distraction is a good technique to fend off symptoms of anxiety and stress when they feel overwhelming. This can also give you space to deal with a situation in a more considered and positive manner.

Distraction simply involves trying to take your mind off uncomfortable feelings or thoughts. You can do this by trying to focus on something unrelated. Often this helps them to pass.

Ideas to help distract you from your troubling thoughts or anxiety include:

- Try to appreciate small details in your surroundings.
- Count backwards from 1000 in multiples of 7.
- Focus on your breathing, for example, how it feels to breathe in and out.
- Count things that you can see that begin with a particular letter.
- Visualise being in a pleasant, safe and comfortable environment (e.g. being on a beach).
- Listen to your favourite music. Try to pick out all the different instruments and sounds that you can hear.

As with any relaxation exercise, it may take a few minutes before you begin to feel like it is working.

Visualisation

A quick way of getting away from a situation without physically leaving.

- Imagine yourself walking to a door
- Open the door and walk down the 3 steps, taking a deep breath for each of the steps
- You walk into an environment where you feel relaxed and calm. This could be a familiar place, a happy memory, or somewhere in your dream
- What can you see?
- What can you hear?
- What can you smell?
- What can you touch?

Spend a few minutes in this place, enjoying the feeling of relaxation

When you feel ready, start to make your way back up the steps, taking a breath for each of the three steps. Make your way back through the door and back into the present.

Mindfulness - “Leaves on a Stream” Exercise

(1) Sit in a comfortable position and either close your eyes or rest them gently on a fixed spot in the room.

(2) Visualize yourself sitting beside a gently flowing stream with leaves floating along the surface of the water. Pause 10 seconds.

(3) For the next few minutes, take each thought that enters your mind and place it on a leaf... let it float by. Do this with each thought – pleasurable, painful, or neutral. Even if you have joyous or enthusiastic thoughts, place them on a leaf and let them float by.

(4) If your thoughts momentarily stop, continue to watch the stream. Sooner or later, your thoughts will start up again. Pause 20 seconds.

(5) Allow the stream to flow at its own pace. Don't try to speed it up and rush your thoughts along. You're not trying to rush the leaves along or “get rid” of your thoughts. You are allowing them to come and go at their own pace.

(6) If your mind says “This is dumb,” “I’m bored,” or “I’m not doing this right” place those thoughts on leaves, too, and let them pass. Pause 20 seconds.

(7) If a leaf gets stuck, allow it to hang around until it's ready to float by. If the thought comes up again, watch it float by another time. Pause 20 seconds.

(8) If a difficult or painful feeling arises, simply acknowledge it. Say to yourself, "I notice myself having a feeling of boredom/impatience/frustration." Place those thoughts on leaves and allow them float along.

(9) From time to time, your thoughts may hook you and distract you from being fully present in this exercise. This is normal. As soon as you realize that you have become side-tracked, gently bring your attention back to the visualization exercise.

Appendix L: Participant Debriefing Sheet

Debriefing Information Sheet

Thank you for agreeing to participate in this study. This research aims to understand the cognitive, emotional and behavioural impact of betrayal for people with a personality disorder in order to inform treatment and interventions.

You were asked to reflect on your own experienced of betrayal when answering the questions. If you are experiencing any difficult emotions due to your participation in this study please consider the following suggestions to help manage the distress. See examples of each at the end of this sheet.

Relaxed Breathing

Deep muscle relaxation

Distraction

Visualisation

Mindfulness

Contacts for further support

If you want feel you would like to speak to someone about the way you feel you can call the **Samaritans** on **08457 90 90 90** or visit their website at <http://www.samaritans.org/>. They provide a confidential listening service.

If you are currently under the care of a mental health team you might find it helpful to contact your key worker.

If you don't feel you have received adequate support from the above services, you can contact the chief investigator of this project for support, Dr. Janet Feigenbaum on [REDACTED] during office hours.

If you feel that we have not addressed your questions adequately or if you have any concerns about our conduct, then please contact our supervisor Dr. Janet Feigenbaum (Strategic and Clinical Lead for Personality Disorder Services, North East London NHS Foundation Trust and Senior Lecturer, Research Department of Clinical, Educational and Health Psychology, UCL) on [REDACTED] or by email at [REDACTED].

Appendix M: Outline of Joint Working

Joint Working

This project was carried out in conjunction with another Doctorate of Clinical Psychology trainee, Rakhi Shah, at the University College of London. Rakhi Shah investigated the association between internalised emotional disorders and betrayal trauma as part of the project. The paragraph below outlines the relationship between the two projects.

An overview of Rakhi Shah's contribution to the joint study

Given that the joint project relied on the same study sample, the implementation of focus groups, recruitment and data collection of the current study was jointly conducted with Rakhi Shah.

Both trainees were equally involved, and equally contributed to, this process. This was the full extent of the collaboration and contribution by Rakhi Shah.

All subsequent theoretical conceptualisation, development of the BRS and data analysis was conducted independently. In addition to this, Rakhi Shah's project relied on different predictor variables of internalised emotional disorders.