

The role of self-disgust in non-suicidal self-injury among individuals
with personality disorder.

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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.

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Overview

The overall focus of this thesis is on the role of negative affect-states in non-suicidal self-injury (NSSI) amongst adults with psychopathology. Special emphasis is placed on the emotion of self-disgust. The thesis is structured in three parts.

Part one presents a systematic literature review of the emotion of anger in NSSI. Specifically, it is concerned with the question whether NSSI serves as an anger management strategy. Most studies reported a decrease in levels of self-reported anger after NSSI, whereas only some studies endorsed high levels of anger precipitating NSSI. The methodological weaknesses of the studies in the review are discussed and recommendations for future research are provided.

Part two presents an original empirical investigation into the role of self-disgust in NSSI amongst individuals with personality disorder features. Self-disgust was found to significantly predict lifetime NSSI status. Moreover, first indications were found of a possible association between self-disgust and the urge to self-punish. The results are discussed in consideration of the methodological limitations of the study. Part two concludes with a discussion about possible clinical interventions for pathological self-disgust. This empirical study was conducted in conjunction with another doctoral research project in clinical psychology.

Part three provides a critical reflection on the empirical paper. Benefits and limitations of online research are discussed. Reflections, including ethical implications, of service user involvement in research are offered. Finally, the role of (self-)disgust in the societal context is considered.

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Part One. Systematic Literature Review

Non-suicidal self-injury as anger management strategy in clinical and
subclinical populations:
A systematic review

Abstract

Aims. Anger has been identified as specific risk factor for non-suicidal self-injury (NSSI) in clinical and subclinical populations. Therefore, anger may play a significant role in the development and maintenance of self-injury. This review aimed to investigate as to whether NSSI serves as anger management strategy.

Method. A systematic literature search was conducted using the electronic databases PsycINFO, PUBMED and EMBASE. An additional hand search was carried out. The relevant papers were selected based on inclusion and exclusion criteria. A paper quality assessment was undertaken and results were synthesised narratively.

Results. Fourteen papers were identified, published up until October 2015. The current evidence suggests that individuals with high levels of anger use NSSI as a strategy to reduce these feelings. However, anger was not always the most prominent NSSI precipitator, which supports previous evidence that NSSI serves a variety of functions.

Conclusions. This is the first review to investigate the role of anger in NSSI. Despite indications that NSSI may serve as anger management strategy, the quality of the evidence to date is not satisfactory. Further high quality research is needed to add to a better understanding of the complex relationship between anger and NSSI.

1. Introduction

1.1. Self-injury definitions

Non-suicidal self-injury is the wilful act of injuring oneself without apparent suicide intent (Pattinson & Kahan, 1983). A variety of names have been used interchangeably to describe the phenomenon of self-injury: deliberate self-harm (Gratz, 2001), deliberate self-injury (Klonsky, 2007), self-injurious behaviour (Muehlenkamp, 2005), non-suicidal self-injury (Muehlenkamp, 2006), self-mutilation (Simeon, et al., 1992) and parasuicide (Startup, 2001). Different connotations have been ascribed to these terms. For instance, the word 'self-mutilation' has been suggested to carry more severe and permanent connotations than non-suicidal self-injury (Gratz, 2001; Mangnall & Yurkovich, 2008). The term 'non-suicidal self-injury/NSSI' more explicitly excludes acts with suicidal intent and more recently 'deliberate self-harm/DSH' has been assessed more stringently, separating self-harm acts with suicidal intents from DSH acts without suicide intent (Muehlenkamp, Claes, Havertape & Plener, 2012). However, researchers still do not always differentiate between self-injury with and without suicide intent (e.g. Hutchison, Bruce & Simmons, 2008; Shahid et al., 2009). A universal and congruent understanding of self-injury would be essential: research has shown that risk factors and outcomes differ considerably between individuals who self-injure with an intention and those without an intention to kill themselves (Mangnall & Yurkovich, 2008).

However, the question has been raised as to whether NSSI and attempted suicide are always dichotomous. Suicidality appears to co-occur with self-injury to varying degrees (Kapur, Cooper, O'Connor & Hawton, 2013). The authors also highlight the issue of ambivalence. A considerable number of individuals who self-injure report indifference about living whilst harming themselves. Individuals who self-injure without an intention to die are still more likely to attempt suicide than the general population (Cooper et al., 2005). Distinguishing between NSSI with and without suicide intent based on underlying motives

has also been difficult since often individuals who engage in NSSI report multiple motives as well as unclear and changing motives (Kapur et al., 2013). Studies also tend to differ with regards to the methods of NSSI that are assessed, the time frame within which participants engage in NSSI and the number of self-injury acts required to meet clinically relevant criteria for NSSI (Bracken-Minor & McDevitt-Murphy, 2014). The term 'non-suicidal self-injury' (NSSI) will be used throughout this review.

1.2. Prevalence and risk factors of NSSI

Due to inconsistent definitions of NSSI different prevalence rates have been reported (Muehlenkamp et al., 2012). In an adult community sample, a lifetime prevalence of 5.9% was reported (Klonsky, 2011), whereas in a longitudinal study a lifetime prevalence rate of 4% was found (Klonsky, Oltmanns & Turkheimer, 2003). In Klonsky's study in 2011 participants with and without suicide intent were included, whereas in his earlier study only participants without suicidal intent were recruited. Adolescents and young adults are at significantly higher risk of NSSI with prevalence rates ranging from 14-46% (Klonsky & Muehlenkamp, 2007).

Plethora of research has focused on risk factors for NSSI. For instance, Gratz (2003) conducted a literature review and found that childhood abuse (sexual, physical), neglect, loss, emotional reactivity, and attachment insecurity all increased the risk for NSSI. Other predictors of NSSI include female gender, depressive symptoms (Plener, Schumacher, Munz & Groschwitz, 2015), a history of mental health treatment and being single (Klonsky, 2011). Individuals with a diagnosis of personality disorder appear to be at particular high risk for self-injury (Krysinska, Heller & De Leo, 2006). Children/adolescents who reported more internalising problems and health complaints as well as young people who reported a history of bullying were also more likely to engage in NSSI (Sourander, Aromaa, Pihlakoski, Haavisto, Rautava et al., 2006). Predictors of repeated self-injury may include previous

NSSI, previous psychiatric treatment, singlehood and unemployment (Johnston, Cooper, Webb & Kapur, 2006).

1.3. NSSI and suicide attempts

As mentioned above, NSSI itself has been shown to be predictive of suicide attempts. Cooper et al. (2005) conducted a four-year cohort study and found that individuals who engaged in NSSI had a 30-fold increase in risk of suicide, with females being more likely to commit suicide. The authors also found that within the first six months of a self-injury episode, suicide rates were highest. Suicide was more likely in individuals who did not live with a close relative, who had a history of previous psychiatric treatment, a history of self-injury, substance misuse and who had health problems. Owens, Horrocks and House (2002) reported a suicide rate of over 7% even nine years after the NSSI episode.

1.4. NSSI as trans-diagnostic behaviour

NSSI is heterogeneous and occurs trans-diagnostically in a range of psychiatric disorders (Klonsky & Muehlenkamp, 2007). Emotion dysregulation, shown to increase the likelihood of NSSI, is one of the key characteristics in Borderline Personality Disorder (BPD) (Carpenter & Trull, 2014) and therefore, as expected, numerous studies have shown that individuals who engage in NSSI have significantly more features of DSM IV Personality Disorders (Konsky et al., 2003; Klonsky & Muehlenkamp, 2007). Even though self-injury is very prevalent in Personality Disorders (PD) with 60-70% engaging in self-injurious behaviour, only 40-50% of individuals who self-injure have a diagnosis of PD (Bateman, 2010; Haw, Hawton, Houston & Townsend, 2001; Oumaya, Friedman, Pham, Abou Abdallah, Guelfi & Rouillon, 2008). NSSI has also been reported to occur in eating disorders (Paul, Schroeter, Dahme & Nutzinger, 2002), clinical anxiety and depression (Haw et al., 2001) and substance use disorders (Gratz & Tull, 2010). Furthermore, clinically relevant

NSSI has been found in subclinical populations such as undergraduate samples with mental health problems (e.g. depression) (Croyle & Waltz, 2007). Given the evidence of NSSI occurring trans-diagnostically, NSSI has been added to section III of DSM-V as 'non-suicidal self-injury disorder', a clinical syndrome that requires further study (Zetterqvist, 2015).

1.5. Functions of NSSI

In a comprehensive systematic review, the alleviation of negative affect was identified as most frequent function of NSSI, followed by self-punishment (Klonsky, 2007). Weaker associations were found for regulation of dissociation, interpersonal functions, anti-suicide (e.g. to prevent acting on suicidal feelings) and sensation-seeking functions. Gratz (2003) also highlighted the emotion regulation function of NSSI. Individuals who self-injure tend to have difficulties finding effective strategies to manage emotional distress. In many cases their upbringing was characterised by neglect and abuse and therefore not conducive to understanding and coping with emotions, leading to emotional instability (Bateman & Fonagy, 2010; Linehan, 1987). In psychiatric populations, intrapersonal functions (emotion regulation, self-punishment) are reported more frequently than interpersonal functions of NSSI, such as bonding with peers (Sadeh et al., 2014).

A functional approach to understanding NSSI has been proposed with a focus on the maintenance of NSSI through reinforcement processes: intra-personal negative reinforcement (e.g. distraction from negative thoughts), intra-personal positive reinforcement (e.g. increase of desired emotional states), inter-personal negative reinforcement (e.g. avoidance of social situations) and inter-personal positive reinforcement (e.g. caring response, help-seeking). The evidence-base appears to confirm this four-function model (Nock, 2009; Nock & Prinstein, 2004).

1.6. Anger

Anger is one of the basic universal emotions (Ekman et al., 1987) and impacts on an individual's sense of self and orientation towards others (Paivio, 1999). Even though anger can have detrimental effects on mental health and can contribute to mental ill health such as PTSD and depression (Gardner & Moore, 2008), from an evolutionary perspective anger has an adaptive role as it enables the individual to respond to threats. Clinical anger and related cognitions and behaviours tend to occur trans-diagnostically (Owen, 2011). Sometimes anger may mask underlying feelings of fear and shame (Paivio, 1999).

A variety of models have been proposed which aim to shed light on the aetiology of clinical anger. As opposed to other theoretical models, the anger avoidance model takes into account that anger is a necessary basic human emotion (Gardner & Moore, 2008). The model suggests that clinical anger develops through biological vulnerability (i.e. temperament), adverse early experiences (i.e. uncontrollable, hostile environment) and information processing biases (i.e. an anticipation of hostile intent or personal violation). Heightened arousal and the perception of unpredictability of others increase the likelihood of anger to occur. The anger avoidance model proposes that ineffectively processed anger leads to behavioural avoidance (aggressive behaviour) and cognitive avoidance (i.e. hostile rumination) which both prevent the emotional processing of anger.

Anger and the conceptually related constructs of hostility and aggression appear to be involved in NSSI (Jenkins, McCloskey, Kulper, Berman & Coccaro, 2015). Given the link between anger, hostility and aggression, it is no surprise that the two latter affect-states have been highlighted as risk factors for NSSI (Tang, Ma, Guo, Ahmed, Yu & Wang, 2013). Research has also indicated that some individuals engage in NSSI to express aggression or hostility (Gallagher & Sheldon, 2010). Hostility has been suggested to be the cognitive component of aggression, characterised by bitterness and resentment (Buss & Warren, 2000). Aggression has been defined as "any behaviour directed toward another individual

that is carried out with the proximate (immediate) intent to cause harm.” (Anderson & Bushman, 2002, p.28). Anger is the emotional component of aggression and hostility (Dyer et al., 2009; Martin, Watson & Wan, 2000) and will be the focus of this review.

The anger avoidance model is likely to be relevant to NSSI since self-injury has been suggested to be a form of experiential avoidance (Chapman, Gratz & Brown, 2006). NSSI may serve the function of escaping and avoiding unwanted emotional experiences. Studies have examined trait anger in individuals who self-injure, which is significantly more pronounced than in people who do not self-injure (Milligan & Andrews, 2005; Lavania et al., 2012; Simeon et al., 1992). As a result, NSSI may serve as an anger avoidance strategy (Espeset, Gulliksen, Nordbo, Skaderud & Holte, 2012). In line with this hypothesis, some research has shown elevated levels of anger suppression in people who engage in self-injury (Harned, Rizvi & Linehan, 2010).

According to Nock, Prinstein and Serba (2009) self-injury is significantly more likely when individuals are feeling angry at themselves, hence anger may be one of the key triggering emotions of NSSI. Investigating specific emotions involved in NSSI may be relevant for treatment planning (Klonsky, 2009; Snir, Rafaeli, Gadassi & Berenson, 2015). Up until now there has not been a literature review specifically investigating the role of anger in self-injury. Only a few attempts have been made to understand specific affect-states and this in turn makes it more difficult to target certain emotions when providing NSSI interventions (Brown, 2002). Improving the knowledge of the role of anger in NSSI may be of particular importance because research has highlighted that anger is a significant risk factor for suicide attempts (Esposito, Spirito, Boegers & Donaldson, 2003).

2. Research aim and questions

2.1. Aim

This systematic review aimed to investigate whether non-suicidal self-injury is a

strategy to manage anger. Quantitative studies into emotions and anger-related reasons precipitating NSSI in clinical and subclinical populations were selected. This was undertaken with the objective to establish whether anger is commonly experienced prior to NSSI. In keeping with the aim of this review, studies into anger in the course of NSSI episodes were of further interest. If anger decreased following NSSI episodes, this would be an indication that NSSI is as an anger regulation strategy.

2.2. Research questions

- I. Is anger a common affect-state preceding self-injury?
- II. Do levels of anger decrease following self-injury?

3. Methodology

A systematic literature search was conducted, which is defined as a standardised and technical process that enables transparency and objectivity (Jesson, Matheson & Lacey, 2011). According to Torgerson (2003) systematic literature reviews are the golden standard of synthesising existing research and effectively identifying gaps in knowledge. A quality assessment (cf. Kmet, Lee & Cook, 2004) was undertaken. Subsequently, relevant data was extracted and synthesised narratively.

3.1. Search strategy

The systematic search was carried out using three databases: PsycINFO, MEDLINE and EMBASE. The search targeted three domains: non-suicidal self-injury, psychiatric disorders/subclinical populations and anger (see table 1). The search terms of each domain were entered separately using the 'or' function and were then combined with the other domains using the function 'and' of each database.

A search term to identify personality disorder samples was specifically included

because these have consistently been reported to have disproportionate rates of NSSI, compared to other psychiatric disorders (Klonsky, 2009; Klonsky & Muehlenkamp, 2007). As mentioned in section 1.6, there is an evidence-base on the involvement of hostility and aggression in NSSI. Whilst reading into the literature to identify the research questions, it surfaced that in some of the papers that aimed to investigate hostility or aggression, anger was measured secondarily (e.g. Claes, Vandereycken & Vertommen, 2007). In these papers anger was frequently not highlighted in title and abstract. Therefore, terms related to hostility and aggression were part of the search strategy in order to ensure that papers reporting results on anger were not missed.

Table 1

Search domain and search terms

Domain	Search terms
Non-suicidal self-injury	self-injury or non-suicidal self-injury or non-suicidal self-injur* or self-injur* behavi*, self-mutilation, self-inflicted wounds
Psychiatric Disorders / Subclinical sample	mental disorder* or psychiatric disorders* or mental health problem* or axis I disorder* or axis II disorder* or personality disorder*
Anger	anger or hostility or aggression or anger control or relational aggression or aggressive behavi* or aggressiveness

3.2. Inclusion and exclusion criteria

Inclusion and exclusion criteria were chosen to identify relevant papers in keeping with the research questions.

Inclusion Criteria:

- a. Adolescents (≥ 12 years), Adults, Older Adults - Given that adolescents and young adults have the highest prevalence rates of NSSI, the search aimed for both adults and adolescents.

- b. Psychiatric Disorders: Personality Disorders, Eating Disorders, Substance Use Disorders, Affective Disorders
- c. Subclinical populations: samples with clinically relevant NSSI and mental health problems
- d. Quantitative Research
- e. State Anger in NSSI episodes – Only studies that investigated feelings of anger before, during or after NSSI were included.
- f. Studies up until October 2015
- g. Language: English
- h. Peer reviewed journals

Exclusion Criteria:

- a. Children (≤ 11 years)
- b. Hostility and aggression in NSSI - Despite evidence that these constructs are related to anger, they only partially overlap and therefore their phenomenology and measurement is different (Martin et al., 2000). Excluding these constructs was viewed to improve the internal validity of this review.
- c. Trait anger in individuals who engage in NSSI – In keeping with the aim of this review, studies that measured levels of trait anger in individuals who engage in NSSI were not included.
- d. Neuro-developmental Disorders: Attention-Deficit Hyperactivity Disorder, Autism Spectrum Disorder – NSSI in neuro-developmental disorders was viewed unrepresentative of NSSI in general psychiatric populations (Symons, 2011).
- e. Intellectual Disability – NSSI in individuals with learning disabilities was viewed unrepresentative of the general psychiatric population.

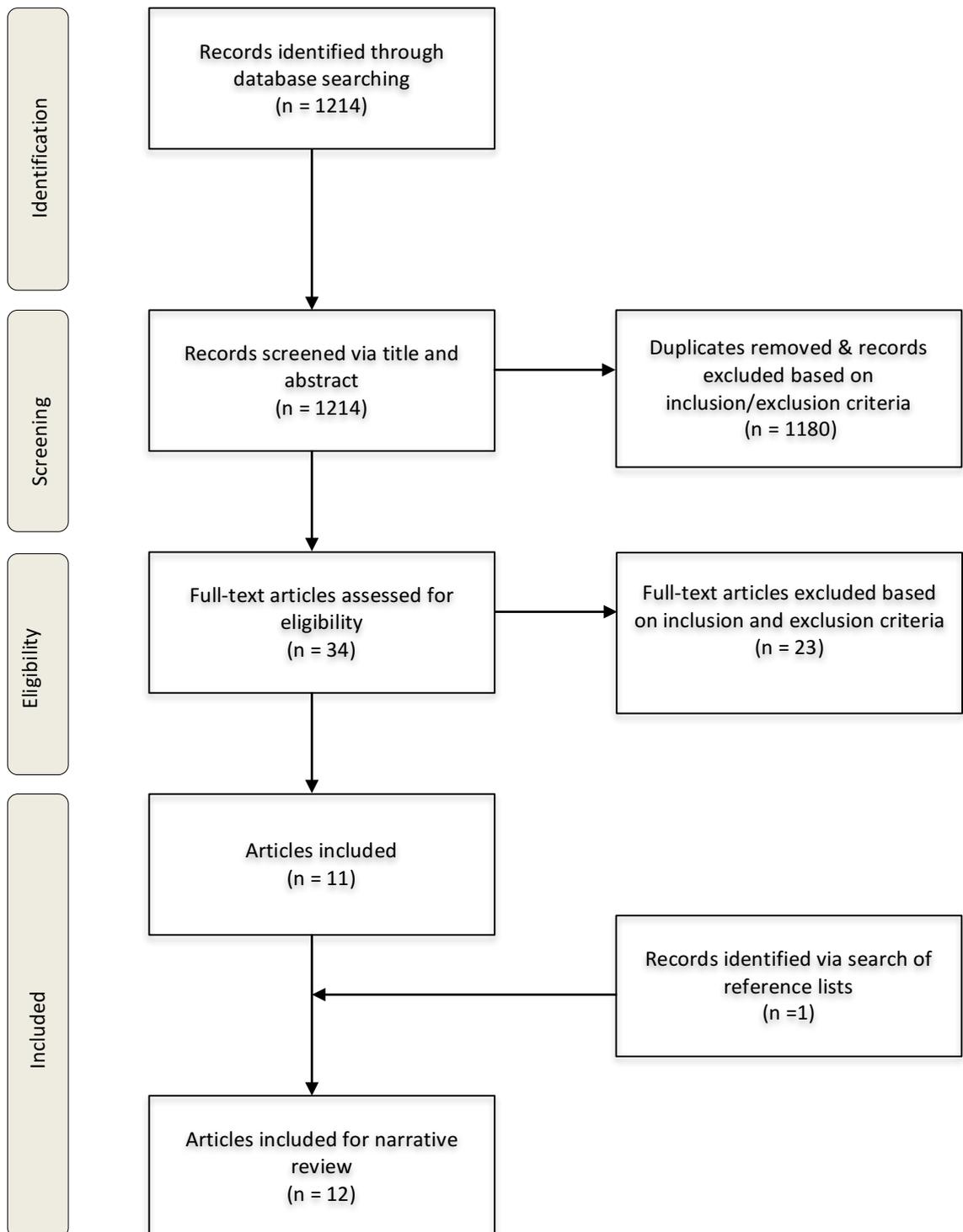
- f. Trans-gender studies – Trans-sexuality has been identified as unique and specific risk factor for NSSI and was viewed to differ from NSSI in psychiatric populations (Liu & Mustanski, 2012).
- g. Dementia – Self-injury in individuals with neuro-degenerative disorders was viewed to lack comparability to forms of self-injury that are less likely related to neurological deficits (Haw, Harwood & Hawton, 2009).
- h. Psychotic and Dissociative Disorders – Accessing thoughts and emotions related to self-injury whilst experiencing reality disturbance was considered unreliable (Chapman & Dixon-Gordon, 2007; Harvey et al., 2008).
- i. Studies reporting self-injury with suicide intent – The phenomenology of self-injury with suicide intent differs from the phenomenology of NSSI (Mangnall & Yurkovich, 2008).

3.3. Paper selection process

This search strategy resulted in 498 papers in PsycINFO, 353 papers in MEDLINE and 363 in EMBASE (N=1214). 1180 articles were excluded based on screening of title and/or abstract. The remaining 34 full-text articles were assessed for eligibility of which 11 papers met inclusion and exclusion criteria. The reference lists of these papers were searched by hand in order to ensure no relevant papers were missed. These papers were also assessed based on inclusion and exclusion criteria. One additional article was found and was included in the narrative review (see Figure 1 for search details).

Figure 1

Flowchart of search



3.4. Paper quality assessment

The selected papers were assessed according to specific criteria, which are displayed in Table 2. These criteria were adopted and modified from the Standard Quality Assessment Criteria by Kmet et al. (2004) (Appendix A). This quality assessment tool was chosen because it was developed to be applicable to a variety of quantitative research designs. Relevant criteria were extracted and two criteria were added to capture study characteristics particularly relevant to the review at hand (NSSI definition and measurement).

Table 2

Paper Quality Scoring System

Number	Criterion	Scoring
1	Clear definition of NSSI provided?	Range 0, no; 1, yes
2	Sampling method chosen to reduce selection bias?	Range 0, opportunistic; 1, random
3	Subject characteristics sufficiently described?	Range 0, no; 1, age, gender; 2, age, gender, psychiatric diagnosis
4	NSSI measurement appropriate and sufficient?	Range 0, none; 1, protocol, interview, self-report; 2, multiple sources
5	Results analysed and reported sufficiently?	Range 0, no; 1, partially; 2, yes
6	Results discussed in the context of study limitations?	Range 0, no; 1, partially; 2, yes

Note. NSSI=Non-suicidal self-injury; The maximum score was 10. Papers that achieved a score of 0 to 3 were considered to be of low quality, papers with a score between 4 and 7 of moderate quality and papers that achieved a score of 8 to 10 were classified as high quality papers.

3.5. Criteria for synthesising the evidence

Anger was ascribed a 'significant' role if it was reported as either primary or

secondary reason for NSSI and/or if, compared to other emotions, anger was reported most frequently. Of interest was also the proportion of participants reporting anger in the run-up to and after NSSI.

3.6. Study characteristics and quality

Table 3 provides a summary of the studies in keeping with the study aims. It highlights the sample characteristics, measurement of NSSI and anger, findings and a critical evaluation of each paper.

Of the 12 papers, six papers were of moderate quality (Kemperman, Russ & Shearin, 1997; Herpertz, 1995; Briere & Gil, 1998; Chapman & Dixon-Gordon, 2007; Nixon, Cloutier & Aggarwal, 2002; Bennum, 1983) and six papers achieved a high quality rating (Brown, Comptois & Linehan, 2002; Klonsky, 2009; Claes, et al., 2007; Kleindienst et al., 2008; Kamphuis, Ruyling & Reijntjes, 2007; Weinberg & Klonsky, 2010). Table 4 provides a summary of the paper quality assessment.

Table 3

Study characteristics and results

Author(s) & Date	Sample Size	Sample Characteristics Age (mean)	Study Design	Measurement of NSSI and Anger	Anger related to NSSI (assessed as NSSI motive and/or affect-state)	Critical evaluation
Weinberg & Klonsky (2012)	a) 39 b) 33	a) College students engaging in NSSI (high levels of BPD symptoms, anxiety, depression) 29 female, 10 male b) Healthy control subjects Age: 20.3 yrs.	Experimental	ISAS (Klonsky & Glenn, 2009); Laboratory Experiment (anger induction – self-chosen electric shock – self-reported anger using SAM, Bradley & Lang, 1994)	Reason Not assessed. Affect-state Self-administration of high electric shock led to greater reduction of anger, even more so when participants felt a manageable amount of pain. Feelings of anger reduced significantly after electric shock.	Strengths Study design - causal inferences possible. High internal validity. Limitations External validity compromised. College sample – limited generalizability. Psychiatric symptoms were only assessed with a screening instruments.
Brown et al. (2002)	75	Adult females with diagnosis of BPD (as part of RCT) Age: 30 yrs.	Self-report	Semi-structured interview: PHI (Linehan, Wagner & Cox, 1989) -includes 20-item list of reasons for parasuicide	Reason 80% of cases reported anger expression as reasons for engaging in NSSI. Affect-state Not assessed.	Strengths Self-injury assessed using comprehensive semi-structured interview. Inter-rater reliability assessed. Limitations Female sample – limited generalizability. No assessment of affect-states.
Klonsky (2009)	39	Undergraduate students with a history of at least five NSSI episodes (64%	Self-report	Structured Interview designed by the authors (includes a list of 37 reasons for NSSI,	Reason 'To express anger' was not frequently endorsed as primary reasons but 54% endorsed it as	Strengths Sound assessment of NSSI using structured interview. Assessment of emotions pre-, during and post NSSI.

		received some form of mental health treatment) 77% female Age: 19.4 yrs.		48 consequences of NSSI and list of 40 affect-states related to NSSI)	secondary reason. Affect-state <i>Precipitator:</i> Anger was not the most frequently reported compared to other emotions. <i>Change of affect:</i> Anger sign. decreased, but not as much as other affect-states. Decrease of anger not frequently stated as primary consequence of NSSI.	Limitations No report of the type of mental health treatment provided and no assessment of psychiatric symptoms conducted. Inclusion of individuals with >5 NSSI episodes – clinical relevance of sample questionable. undergraduate sample – generalisability compromised.
Kamphuis et al. (2007)	106	Adult females engaging in NSSI recruited from self-injury support group (56% BPD, 18.2% other PD, 17% major depression, 12% Anxiety Disorder, 11% Eating Disorder) Age: 33.1 yrs.	Self-report	Self-report questionnaires: SIMS (Osuch, Noll & Putman, 1999); Self-Injury Inventory developed by authors; POMS (McNair, Lorr, & Droppleman, 1971) - affect before during and after NSSI)	Reason Not assessed. Affect-state <i>Change of affect:</i> Anger significantly decreased pre-post NSSI. After one day anger significantly increased again but was still lower than immediately before NSSI.	Strengths Levels of anger were compared pre- vs. post NSSI + one day later. Robust assessment of NSSI and anger using multiple questionnaires. Thorough statistical analysis. Limitations Psychiatric diagnoses based on self-report. Female sample – generalizability. Heterogeneous sample of variety of psychiatric diagnoses limits conclusive validity of results.
Claes et al. (2007)	399	Adult psychiatric inpatients (49% Eating Disorders, 27% Substance Misuse, 11% mood disorders, 8% PD) 265 female, 134 male	Self-report	Self-report questionnaire: SIQ (Mina, Gallop, Links, Heslegrave, Pringle, Wekerle et al., 2006) - includes assessment of emotions before/after NSSI), SHI-22	Reason Not assessed. Affect-state High rating of feelings of anger before NSSI for both males and females. Males reported higher scores on anger at others before NSSI. A decrease in all negative	Strengths Gender comparison. Self-injury and affect-states assessed with two robust questionnaires. Limitations No longitudinal data. Samples were not matched – possibility of biased results.

		Age: 30.8 yrs.		(Sansone, Wiederman & Sansone, 1998)	emotions was reported post NSSI.	
Kleindienst et al. (2008)	95	Adult female psychiatric patients with diagnosis of BPD aged 18-51 Age: 30.4 yrs.	Self-report	Self-rating instrument developed by authors: QNSSI (includes assessment of motives and emotional states)	Reason Anger-specific motive not assessed. Affect-state <i>Precipitator:</i> Anger was not the most prominent emotion before NSSI. <i>Change of affect:</i> A significant decrease in anger pre-post NSSI was reported.	Strengths Comprehensive, structured self-rating instrument to assess affect-states in NSSI. Both motives and affect-states were assessed. Exhaustive list of affect-states to select from. Limitations Retrospective self-report with time elapsed since last NSSI one year – possibility of biased recall. Female sample – limited generalisability.
Briere & Gil (1998)	93	Adults engaging in NSSI with a history of childhood abuse recruited from the general population (73% PTSD, 37% BPD, 29% Multiple PD), age range: 18-90 96% female Age: 46 yrs.	Self-report	List of 30 reasons for NSSI established by authors (includes 'get rid of anger'); list of 12 emotions immediately before and after NSSI; TSI (Briere, 1995) includes item to assess NSSI (yes/no)	Reason 71% gave 'to get rid of anger' as reason for engaging in NSSI. Affect-state <i>Precipitator:</i> 35% felt angry at themselves prior to NSSI, 56% felt angry at others prior to NSSI. <i>Change of affect:</i> Both anger at self and others decreased post NSSI.	Strengths Exhaustive list of NSSI motives to select from. Age range likely to be representative of general population. Limitations Incomplete list of affect-states and no standardised assessment tool used. Self-reported psychiatric symptoms. Study limitations not discussed. Sample predominantly female – limited generalisability.
Chapman & Dixon-Gordon (2007)	31	Adult female inmates with NSSI (50.8% BPD) Age: 33.9 yrs.	Self-report	Structured Interview: LPC-2 (Linehan & Comptois, 1996); Standard list of nine emotions	Reason Not assessed. Affect-state <i>Precipitator:</i> Anger prior to NSSI was reported by the largest percentage (45.16%). The BPD	Strengths Structured interview to assess NSSI. Affect-states reported pre and post NSSI. Comparison between inmates with/without BPD. Limitations

					group was more likely to experience positive emotions post NSSI.	Incomplete list of affect-states. Female sample – limited generalisability. Prison population – representativity? Possible difference in levels of anger between inmates with vs. without BPD diagnosis not reported
Nixon et al. (2002)	42	Adolescents inpatients aged 12-18 engaging in NSSI at least once/month (21 with eating disorder, 18 with substance misuse problem) 36 females, 6 males Age: 15.7 yrs.	Self-report	Self-report questionnaire developed by the authors: OSI (Nixon, Cloutier & Aggrawal, 2002) includes reasons for NSSI	Reason 66.7% of participants stated 'expression of anger' as their reason to engage in NSSI. Adolescents with high levels of internalised anger stated this reason more frequently. Affect-state Not assessed.	Strengths Only adolescents with repetitive and recent NSSI (past six months) included in study – clinically relevant sample. Analysis controlled for gender. Limitations Affect-states before/after NSSI not assessed. Unstandardised questionnaire for the assessment of NSSI and reasons for NSSI.
Kemperman et al. (1997)	38	Adult female psychiatric patients with a diagnosis of BPD and history of at least five NSSI episodes (divided by pain vs. no pain during NSSI) Age: 30 yrs.	Self-report	NSSI not formally assessed; 42 visual analogue scales (emotion ratings before, during, after NSSI)	Reason Not assessed. Affect-state <i>Change of affect:</i> Anger decreased significantly pre-post NSSI. Largest percentage (90%) reported a decrease in anger post NSSI and anger was the affect reported to change the most in the course of a NSSI episode.	Strengths Exhaustive list of affect-states used. Emotions assessed before/during/after NSSI. Analysis of affect change included slope calculation. Limitations No standardised assessment of NSSI. Time not specified since last NSSI episode – recall biases likely. Female sample – generalisability.
Herpertz (1995)	54	Adult female psychiatric patients with history of at least three NSSI	Self-report	Semi-structured interview developed by the authors, self-report questionnaire: SBS	Reason 'Expression of anger' was the most frequent secondary motive for NSSI.	Strengths Robust assessment of NSSI (semi-structured interview and questionnaires). Limitations

		episodes (split into two group: 28 with BPD, 26 without diagnosis of BPD)		(Favazza & Conteriko, 1988), includes affect-states	Affect-state Anger not reported.	No stringent inclusion criterion for NSSI (three NSSI episodes may not be representative of clinically relevant NSSI). Results only reported narratively – insufficient.
		Age: 26 yrs.				
Bennum (1983)	a) 20 b) 20 c) 20	a) Adult psychiatric patients with NSSI – last episode not more than 10 days ago (12 PD, 6 Depression, 2 ‘psycho-neurotic’ 17 female, 3 male Age: 23.3 yrs. b) Adults with depression c) Controls	Case-control (only results of sample a) reported)	Interview Schedule (includes questions on affect related to self-mutilation)	Reason Not assessed. Affect-state <i>Precipitator</i> : Anger at self was reported by 7 (35%). Three individuals reported anger at someone else (15%).	Strengths NSSI inclusion criterion (episode not more than 10 days ago) – reduced recall bias. Limitations Participants included with only 1 previous NSSI episode – not representative of clinically relevant self-injury/limited generalisability. Predominantly females – gender not controlled for. Unstructured interview (no details about content). Study limitations not discussed.

Note. Abbreviations in table: ISAS = Inventory of Statements about Self-injury; SAM = Self-assessment manikin; SIQ = The Self-Injury Questionnaire; SHI-22 = The Self-Harm Inventory; PHI = Parasuicide History Interview; QNSSI = Questionnaire for Non-Suicidal Self-Injury; TSI = Trauma Symptoms Inventory; SIMS = The Self-Injury Motivation Scale; POMS = Profile of Mood States; SBS = Self-Harm Behaviour Survey; LPC-2 = The Life-Time Parasuicide Count-2; OSI = Ottawa/Queen’s Self-Injury Questionnaire; yrs. = years; n/a = not available; BPD = Borderline Personality Disorder; PD = Personality Disorder; PTSD = Post-Traumatic Stress Disorder; NSSI = non-suicidal self-injury.

Table 4

Paper quality assessment

Author(s) & date	NSSI definition	Sampling method	Subject characteristics	NSSI measurement	Report of results	Discussion	Quality Rating
Weinberg & Klonsky (2010)	1	0	2	2	2	2	9
Brown et al. (2002)	1	0	2	1	2	2	9
Klonsky (2009)	1	0	2	2	2	2	9
Kamphius et al. (2007)	1	0	2	2	2	2	9
Claes et a. (2007)	1	0	2	1	2	2	8
Kleindienst et al. (2008)	1	0	2	1	2	2	8
Briere & Gil (1998)	1	0	2	1	2	1	7
Chapman & Dixon-Gordon (2007)	1	0	1	1	2	2	7
Nixon et al. (2002)	1	0	1	1	2	2	7
Kemperman et al. (1997)	1	0	2	0	1	2	6
Herpertz (1995)	1	0	2	1	1	1	6
Bennum (1983)	1	0	2	1	1	1	6

Note. The maximum score was 10. Papers that achieved a score of 0 to 3 were considered to be of low quality, papers with a score between 4 and 7 of moderate quality and papers that achieved a score of 8 to 10 were classified as high quality papers.

3.6.1. Participants. The mean age of the participants was 28.3 years (SD=7.7). The participants' age ranged from 12 (Nixon et al., 2002) to 90 (Briere & Gill, 1998). Demographic information was reported to a satisfactory standard. Eleven studies recruited females only or had disproportionate rates of female participants (table 3), adversely affecting the generalisability of the results. Eight of the 12 studies recruited psychiatric samples and three recruited clinically relevant samples from the general population (mainly college populations, table 3). One study recruited in prison (Chapman & Dixon-Gordon, 2007). It is possible that subclinical populations recruited in the community have less severe mental health problems and perhaps less serious and chronic NSSI, limiting the generalisability of the findings. Opportunistic sampling was undertaken across studies, increasing the likelihood of selection biases. Four studies examined a sample of individuals with BPD, the remaining eight studies drew from mixed psychiatric samples or clinically relevant samples of the general population. Psychiatric symptoms and disorders were not consistently assessed using structured standardised interviews. Some were only based on self-report (e.g. Briere & Gil, 1998) or a hospital chart review (Claes et al., 2007). Sample sizes ranged from 20 (Bennum, 1983) to 399 (Kamphuis et al., 2007). None of the studies carried out power calculations to determine the required sample size, increasing the likelihood of a type II error.

3.6.2. Measurement and design. A limitation across studies was the lack of standardised and validated instruments to assess NSSI, and/or affect-states related to NSSI (table 5).

Table 5

Description and psychometric quality of assessment tools

Authors & date	Assessment of NSSI & anger	Description of assessment tools	Psychometric quality
Weinberg & Klonsky (2012)	Inventory of Statements about Self-Injury (ISAS; Klonsky & Glenn, 2009) The self-assessment manikin (SAM; Bradley & Lang 1994)	Self-injury behaviour scale to assess frequency and type of NSSI. Visual analogue scale to assess anger arousal on a 9-point scale (9 being the highest arousal).	Good reliability and validity (Klonsky & Olino, 2008). High test-retest reliability ($r = .85$) & internal consistency ($\alpha = .85$) (Klonsky & Glenn, 2009). Well validated (Broekens, 2012) and widely used (Ong, Cardé, Gross & Manber, 2011). High concurrent validity (.94) (Morris, 1995).
Brown et al. (2002)	Parasuicide History Interview (PHI; Linehan, Wagner & Cox, 1989)	47-item semi-structured interview to differentiate between suicidal and non-suicidal self-injury. The PHI includes a 29-item list to assess reasons for parasuicide (this list was added by the authors),	The inter-rater agreement of the PHI was assessed and found to be high ($r = .85$) (Brown et al., 2009). The list of reasons was derived from unstructured interviews and clustered by expert consensus. The inter-rater reliability of the consensus ranged from .65 to .77 (Brown et al., 2009).
Klonsky (2009)	Screening instrument to identify participants with a history of NSSI (one question) Unpublished structured interview designed by the author	<i>“About how many times in your life have you intentionally (i.e., on purpose) cut your wrist, arms, or other areas of your body (e.g., with a knife, scissors, razor blade, etc) even though you weren’t trying to commit suicide?”</i> The interview includes a list of 37 reasons for NSSI, 48 consequences of NSSI and 40 affect-states related to NSSI (all rated on 5-point Likert scale)	No reference of screening instrument provided. Comprehensive structured interview but no psychometric properties available.
Kamphuis et al. (2007)	The Self-Injury Motivation Scale (SIMS; Osuch, Noll & Putman,	37-items scale to assess motives fro NSSI (100mm line ranging from 0-never to 10-always). Six subscales (affect	The internal consistency of the subscales was assessed in the study sample and found to range from .65 to .81

	1999)	modulation, loneliness, self-punishment, influencing others, magical control, self-stimulation).	(Kamphuis et al., 2007).
	Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992)	32 items to assesses five affect-states including anger (originally rated on 5-point Likert scale; authors adapted the answer format to yes/no).	The internal consistency of affect-states ranged from .66 to .81 (Kamphuis et al., 2007). A similar internal consistency was previously reported (McNair, Lorr & Droppelman, 1971).
	Unpublished self-injury inventory developed by authors	21-item composite questionnaire to assess frequency, recency, topography and treatment history	-
Claes et al. (2007)	The Self-Injury Questionnaire (SIQ; Mina et al., 2006)	Assessment of NSSI history, frequency, pain during NSSI, motives for NSSI and emotions before/after NSSI (incl. anger).	The authors frequently used the SIQ (e.g. Claes, Vandereycken & Vertommen, 2001; Claes, Vandereycken & Vertommen, 2003) but the literature search did not yield studies examining its psychometric quality. Good internal and concurrent validity (Latimer, Covic, Cumming & Tennant, 2009).
	The Self-Harm Inventory (Sansone, Wiederman & Sansone, 1998)	Assessment of 22 types of self-harming behaviours (scores >5 indicate Borderline Personality Disorder; Sansone et al., 1998).	
Kleindienst et al. (2008)	Questionnaire for Non-Suicidal Self-Injury (QNSSI; Kleindienst et al., 2008)	Assessment of frequency, severity and types of NSSI as well as 12 motives of NSSI and 24 items to assess emotional states before/after NSSI (rating on 5-point Likert scale)	The questionnaire was developed by the authors for the purpose of their study. No psychometric properties were reported.
Briere & Gil (1998)	List of reasons for NSSI and list of affect-states	30 reasons for NSSI and 12 affect-states were assessed.	These lists were created by the authors based on their clinical experience. No psychometric properties were reported.
	Trauma Symptoms Inventory (TSI; Briere, 1995)	Includes one item to assess NSSI (yes/no).	Adequate reliability and validity (e.g. McDevitt-Murphy, Weathers & Adkins, 2005).
Chapman & Dixon-Gordon (2007)	The Life-Time Parasuicide Count-2 (LPC-2; Linehan & Comptois, 1996)	Structured Interview to assess lifetime frequency of NSSI acts.	Little information on psychometric properties available (Mash & Barkley, 2007).
	List of affect-states	Nine affect-states before/after NSSI assessed (anger,	-

sadness, anxiety, guilt, tension, boredom, indifference, relief, calmness).

Nixon et al. (2002)	Ottawa/Queen's Self-Injury Questionnaire (OSI; Nixon, Cloutier & Aggrawal, 2002)	Modification of Queen's Self-Injury Questionnaire (Epstein, 1998) which assesses reasons for NSSI.	No psychometric properties of the modified questionnaire reported.
Kemperman et al. (1997)	NSSI not formally assessed 42 visual analogue scales to assess affect	Participants with a history of 5 NSSI acts were included. Rating is done on a 10cm line with descriptive anchors to assess affect before, during and after NSSI.	- The list was derived from common reasons patients who engaged in NSSI reported. No psychometric properties were reported.
Herpertz (1995)	Self-Harm Behaviour Survey (SBS; Favazza & Conteriko, 1988) Unpublished semi-structured interview developed by the authors	Assessment of motives, affect-states prior to NSSI and pain experience during NSSI. Questions targeted thoughts, emotions, perceptions, behaviours and situational characteristics related to NSSI acts.	The literature search did not reveal studies on the psychometric properties of the SBS. -
Bennum (1983)	NSSI not formally assessed Unpublished interview schedule developed by the author	Participants were included who recently engaged in NSSI (<10 days before). Assessment of affect-states ('anger at self' & 'anger at someone') and precipitating events of NSSI.	- -

Note. NSSI = Non-suicidal self-injury

Robust psychometric instruments with evidence of satisfactory validity and reliability were only used in five studies (Briere & Gil, 1998; Brown et al., 2002; Claes et al., 2007; Kamphuis et al., 2007; Weinberg & Klonsky, 2012). These studies were rated as being either of moderate or high quality. For instance, the SIMS (The Self-Injury Motivation Scale; Osuch, Noll & Putman, 1999) combined with the POMS (Profile of Mood States; McNair, Lorr & Droppleman, 1992) and an additional structured NSSI interview used by Kamphuis et al. (2007) is an example of measurement triangulation that is likely to have increased the accuracy and validity of the assessment of NSSI and related affect-states.

Unstandardised interviews and questionnaires lacking psychometric evaluation were used in the remaining studies. For instance, Kleindienst et al. (2009) used the Questionnaire for Non-Suicidal Self-injury (QNSSI), which the authors developed for the purpose of their study. No psychometric evaluation was carried out, limiting the credibility of the results. Of particular concern was a study that used entirely unstructured interviews as these are known to entail investigator biases, weakening the internal validity (Bennum, 1983).

Some studies in this review used incomprehensive lists of emotions ranging from eight to 12 in order to assess affect-states before and after NSSI (Briere & Gil, 1998; Chapman & Dixon-Gordon, 2007; Claes et al., 2007; Kemperman et al., 1997). This, for instance, contrasts with a study that allowed participants to select from a list of 40 emotions (Klonsky, 2009). More problematically, others did not report the content of their unstructured interview in their method section (Bennum, 1983; Herpertz, 1995). The lack of transparency limits the validity of these studies and therefore, the results need to be interpreted with caution.

Three studies only assessed motives of NSSI (e.g. 'to get rid of anger') and did not explicitly assess affect-states (Brown et al., 2002; Herpertz, 1995; Nixon et al., 2002). Motives may not correspond to the actual emotions that precede self-injury episodes

(Chapman & Gordon-Dixon, 2007) and therefore, these studies need to be considered separately. Nevertheless, they may help to clarify the question as to whether anger may lead to NSSI, given that these studies specifically assessed anger-related reasons for NSSI.

Except for one experimental study design (Weinberg & Klonsky, 2012), all studies were retrospective and used self-report of affect states and/or interview schedules. This has considerable implications for the conclusions that can be drawn. Causal inferences are largely not possible. Retrospective reports of affect-states may access beliefs about emotions related to NSSI rather than the actual emotions that were felt before and after self-injurious behaviour (Kamphuis et al., 2007). Furthermore, emotions may be the result of deciding to self-injure rather than the actual trigger of the self-injury.

Definitions of self-injury and inclusion criteria varied across studies. In some studies, participants needed at least two previous self-injury episodes (i.e. Bennum, 1983), whereas in other studies criteria were more stringent (NSSI episodes > 5) (Klonsky, 2009; Nixon et al., 2002). The differences in NSSI severity and chronicity adversely affect the comparability between studies. Furthermore, the time span between the most recent self-injury and the self-report varied. For instance, in one study participants had to have engaged in NSSI within the past eight weeks (Brown et al., 2002), whereas in other studies the time interval was not defined (e.g. Kamphuis et al., 2007). It is likely that the extent of potential recall biases varied across studies.

In conclusion, the quality of the papers reviewed was varied and partly deficient. Common limitations centred on measurement of NSSI and affect-states, retrospective self-report and female dominated samples.

4. Results

4.1. Evidence of anger as NSSI precipitator

Six studies assessed affect-states prior to NSSI (table 6). Three of these pointed to anger as highly relevant emotion preceding self-injury (Chapman & Dixon-Gordon, 2007; Claes et al., 2007; Briere & Gil, 1998), one study was of high and two of moderate quality. Three studies (Bennum, 1983; Kleindienst et al., 2008; Klonsky, 2009) did not confirm that anger was one of the most common precipitating feeling states. Two of these studies were of high and one of moderate quality. The evidence is reported in hierarchical order, starting with high quality studies.

Table 6

Evidence of anger as affect precipitator

	<u>Anger as prominent affect precipitator</u>	
	Evidence for	Evidence against
Study	Claes et al. (2007)*	Klonsky (2009)*
	Briere & Gill (1998)	Kleindienst et al. (2008)*
	Chapman & Dixon-Gordon (2007)	Bennum (1983)

Note. * = high quality study

4.1.1. Anger as NSSI precipitator. High levels of anger prior to NSSI were reported by male and female psychiatric patients (n=399), who were asked to state which emotions occurred most frequently before their NSSI episodes (Claes et al., 2007). Compared to other emotions both sexes had the highest scores on 'angry at oneself'. Anger at others was less frequently stated but males endorsed it significantly more than female patients. Males also scored significantly higher on general levels of outward aggression, which may explain the gender differences in angry feelings at others. Standardised questionnaires were used for the assessment of affect-states, however, the list of affect-states was incomprehensive,

weakening the internal validity.

Another high quality study (Klonsky, 2009) highlighted that within a self-injury sample of 39 young adults, 54% reported anger at themselves as secondary reason for NSSI and 15% as primary reason. However, the emotion of anger immediately before NSSI was not one of the most frequently reported affect-states. These results indicate that reasons for NSSI and emotions involved in NSSI may not always correspond. Participants with a history of NSSI were recruited from a sample of undergraduate students, provided they had previously engaged in at least five NSSI episodes to ensure a clinically relevant sample. However, this may not be generalisable to psychiatric populations.

A sample of 96 adult females with a diagnosis of BPD did not state anger as the most prominent emotion before engaging in NSSI (Kleindienst et al., 2008). Even though anger did seem to play a role, other emotional states such as guilt and sadness were significantly more common. Participants were mainly recruited at psychiatric outpatient departments and asked to complete a self-rating questionnaire. Twenty-four affect-states were assessed on a five-point Likert scale with a focus on the past year, a time period not recent enough to reduce the likelihood of recall biases.

Compared to other emotions, anger prior to NSSI was the feeling-state most frequently endorsed by 45% of 31 female inmates (Chapman & Dixon-Gordon, 2007). Fifty percent of these participants had a diagnosis of BPD, which was formally assessed using a standardised interview (SCID-II; First et al., 1997). Levels of trait anger in female forensic samples tend to be elevated (Suter, Byrne, Byrne, Howells & Day, 2002), which may compromise the generalisability of the findings.

Another study of moderate quality investigated motives of NSSI as well as 12 affect-states precipitating NSSI (Briere & Gil, 1998). Seventy percent of 93 adults who engaged in NSSI stated 'to get rid of anger' as their reason to self-injure. Thirty-five percent felt angry at themselves prior to engaging in self-injury and 56% reported feelings of anger towards

other. Affect-states were not assessed comprehensively, weakening the internal validity of the findings. The sample consisted of 93% survivors of sexual abuse and 73% of individuals reported a diagnosis of Post-Traumatic Stress Disorder (PTSD). Elevated levels of state anger have been found in individuals with PTSD, possibly related to inefficient arousal regulation and a readiness to fight in response to threat (Olatunji, Ciesielski & Tolin, 2010). Anger precipitating self-injury in PTSD may differ in its aetiology from anger in individuals without PTSD.

Feelings of anger at the self prior to self-injury were not very frequent (35%) in a sample of 20 adults with a history of NSSI (Bennum, 1983). Of these 20 adults 15% reported feelings of anger at others prior to NSSI, also not as common as other emotions. Participants were included, provided their last NSSI episode was not more than 10 days ago to reduce recall biases. However, an unstructured interview was used to investigate affect-states and therefore, the validity of the results is questionable.

4.1.2. Anger-related reasons for NSSI. In a sample of 75 adult females with a diagnosis of BPD, 80% endorsed anger expression as their reason for engaging in NSSI (Brown et al., 2002; table 7). This study was of high quality (tables 3 and 4). Participants had to have injured themselves within the past eight weeks of their self-report, reducing potential recall biases. Another study of moderate quality found that 67% of 42 adolescent inpatients had engaged in NSSI to express anger (Nixon et al., 2002). No standardised assessment of NSSI was carried out. However, 83% engaged in at least one self-injury act per week, which substantially increased the reliability of the recall. Herpertz (1995) pointed at anger expression as a highly frequent secondary motive for engaging in NSSI (after 'relief of tension'). The sample consisted of 54 psychiatric patients, who were divided into BPD and non-BPD groups. The author did not provide numerical results, the findings were only described in a narrative form which is considered insufficient and unreliable. Both Briere and Gil (1998) and Klonsky (2009) also investigated reasons for NSSI (along with affect-

states). Anger expression and wanting to get rid of anger were frequent triggers that led study participants to engage in NSSI (see the previous section for details about studies).

Table 7

Evidence of anger as reason for NSSI

		<u>Anger as reason to engage in NSSI</u>	
		Evidence for	Evidence against
Study	Brown et al. (2002)*		-
	Nixon et al. (2002)		
	Herpertz (1995)		
	Klonsky (2009)*		
	Briere & Gil (1998)		

Note. * = high quality study

In summary, the evidence to date is somewhat inconclusive (table 6). It indicates that some individuals experience high levels of anger before engaging in self-injury and still further research into psychiatric populations and, in particular high quality evidence, is needed to confirm this. Studies into anger-related reasons for NSSI do indicate that anger may be a relevant precursor of NSSI. High percentages of individuals (67-80%) reported wanting to get rid of unbearable feelings of anger or wanting to express anger through self-injury. This was reported across all studies that investigated reasons for NSSI (table 7). Nevertheless, the evidence is scarce and caution is required since reasons for NSSI may not equal affect-states.

4.2. Anger in the course of NSSI episodes

Six studies measured affect change in the course of NSSI episodes. Table 8 presents an overview of the evidence found. The results are presented hierarchically with high quality studies at the outset.

Table 8

Evidence of self-injury as anger management strategy

		<u>Decrease of anger after NSSI</u>	
		Evidence for	Evidence against
Study	Kleindienst et al. (2008)*		-
	Kamphuis et al.(2007)*		
	Kemperman et al. (1997)		
	Klonsky (2009)*		
	Briere and Gil (1998)		
	Weinberg & Klonsky (2010)*		

Note. * = high quality study

In a study that involved 106 adult female psychiatric patients, self-reported affect-states before and after NSSI were compared (Kamphuis et al., 2007). The focus was on the course of affect states before, immediately after and one day after self-injury. The sample included a high percentage of participants with a diagnosis of PD (75%). Results showed that anger significantly decreased after NSSI. Even though it increased slightly again one day later, feelings of anger were still significantly less pronounced one day after than immediately before the NSSI episode. Findings were obtained using a number of rigorous measures (SIMS, POMS, self-injury inventory). The results are, however, gender biased as the sample consisted of females only.

In a laboratory experiment participants were instructed to induce feelings of anger (Weinberg & Klonsky, 2012). The goal of this experiment was to study the effects of NSSI on acute negative arousal. Participants with a history of self-injury (n=39) and a control group (n=33) were randomly assigned to a low and high electric shock condition. Half of the participants in both groups chose a pain level that was 'painful but still tolerable' (experimental/self-injury condition), whereas the other half of participants received an electric shock that was less noticeable (control condition). Then they were asked to write

five minutes about an incident that triggered strong feelings of anger and to focus on their anger as well as related physical sensations. Following a self-report rating of their anger, participants were instructed to apply the electric shock five times (or they received a less painful shock – control condition). After a recovery period of five minutes, participants were asked to rate their feelings of anger again. The results showed that the experimental condition led to significantly more reduction in anger than the control condition. Participants with a history of NSSI reported a significantly greater reduction in anger than the control group. Furthermore, within the NSSI group the high-shock condition led to greater reductions in anger than the low-shock condition. This is the only study in this review that may allow inferences about cause and effect. This college sample of individuals engaging in NSSI had high levels of BPD and affective symptoms, which were assessed using psychometrically robust assessment tools (Borderline Symptom List/BSL-23, Bohus et al., 2009; Depression Anxiety Stress Scales/DASS-21, Henry & Crawford, 2005). However, this subclinical sample may still represent less severe self-injury than tends to occur in pure psychiatric samples. The external validity of this experiment is also likely to be compromised.

Kleindienst et al. (2008) studied 24 affect-states associated with NSSI in 95 females with BPD and reported a significant decrease of anger after self-injury. However, it has to be noted that anger was not one of the most frequently reported emotional precipitators of NSSI. The female only sample lacks generalisability and participants were not instructed to recall the most recent NSSI, weakening the reliability of the self-report.

Klonsky (2009) analysed the change of feeling-states by calculating change scores of affect before and after NSSI. The sample consisted of 39 undergraduate students. Even though feelings of anger at self and anger at others were reported to decrease following NSSI compared to immediately before, anger was not one of the affect-states that showed the greatest change. With a college sample the clinical relevance of the findings is

questionable despite reports on high levels of psychiatric symptoms among participants.

Thirty-eight females with a diagnosis of BPD were asked to indicate their feeling states before, during and after NSSI using 42 visual analogue scales (Kemperman et al., 1997). The authors found that anger significantly decreased after non-suicidal self-injury. Most participants (90%) reported this decrease in anger. Furthermore, compared to other emotional states, anger was the emotion most frequently reported to decrease in the course of self-injury episodes. The strengths of this study included the comprehensive list of 42 analogue scales to measure affect-states and the data analysis in which slope calculations were carried out to identify which affect-state changed the most in the course of a NSSI episode. However, the time interval between the study and the last NSSI episode was not specified, increasing the likelihood of recall biases.

A study by Briere and Gil (1998) highlighted that both feelings of anger at oneself and anger at others before NSSI significantly decreased after self-injury. This sample included 93 adults with a history of NSSI and a high percentage of PTSD.

In summary, there is consistent evidence that levels of anger significantly decrease after self-injury. The studies described were of either high or moderate quality and the majority investigated psychiatric samples, conducive to the generalisability of the results. The findings of the laboratory experiment (Weinberg & Klonsky, 2012) are promising as they allow causal inferences, yet a replication with psychiatric samples would be indicated.

5. Discussion

The aim of this review was to investigate whether NSSI serves as a strategy to regulate unbearable feelings of anger. Therefore, evidence on anger as NSSI precipitator as well as studies that investigated changes in levels of anger in the course of NSSI episodes were reviewed. A significant decrease in anger following NSSI was more consistently reported than evidence of high levels of anger preceding NSSI. Up to now the evidence has

been scarce and has mainly come from retrospective self-report studies with a majority of female participants and mixed psychiatric populations.

The main finding that levels of anger significantly decreased after NSSI supports the hypothesis that self-injury is a strategy to reduce heightened feelings of anger (Brown et al., 2002). This may be explained by the anger avoidance theory and the experiential avoidance model of NSSI (Chapman, Gratz & Brown, 2006; Gardner & Moore, 2008): self-injury could be a behavioural and emotional avoidance of overwhelming feelings of anger. This subjectively experienced benefit of self-injury (alleviation of anger and distress) may maintain the self-injurious behaviour through negative reinforcement processes (Nock, 2009). Additionally, research has shown that suppressing emotions can trigger a rebound effect in which the suppressed emotion recurs and psychological distress increases (Lynch, Robins, Morse & Krause, 2001). This is in line with one study in this review that reported an increase in feelings of anger one day after the self-injury episode (Kamphuis et al., 2007). The lack of emotional processing may lead to a vicious cycle of repeated and chronic self-injury (Chapman et al., 2006).

However, the studies in this review failed to take into account the complexity and the timeline of emotional and cognitive processes preceding and succeeding NSSI. Even though the alleviation of feelings of anger is commonly reported as NSSI function (Gratz, 2003), the evidence also suggests that NSSI can trigger adverse consequences such as shame, regret, self-criticism, self-hatred and self-devaluation (McAllister, 2003; Gratz, 2007; Snir et al., 2015). These may occur slightly later rather than immediately after NSSI and in either case, anger may represent the primary or the secondary emotion. For instance, anger is closely associated with fear, both emotions are governed by similar neurological patterns of activation and may represent an attempt to cope with threats in the environment, either through fight or flight (Cannon, 1929; Olatunji et al., 2010). Affect-states such as anger and fear may co-occur or oscillate (Carver & Harmon-Jones, 2009),

which is a critical question the papers under review did not address.

Previous research has also highlighted that anger may mask underlying feelings of shame (Hjedenberg & Andrews, 2011; Lewis, 1971). In turn, shame-proneness has been associated with anger arousal (Tangney, Wagner, Fletcher & Gramzow, 1992). There is evidence that individuals who engage in self-injury are more prone to feelings of shame (VanDerhei, Rojahn, Stuewig & McKnight, 2014). Therefore, feelings of shame for having done something bad (i.e. self-injury) evoke scrutiny of the self and a desire to hide due to feeling exposed. Shame may then again turn into anger and humiliated rage, reinforcing the self-injurious behaviour. For instance, Klonsky (2009) reported that alongside anger, 60% of participants also reported sometimes feeling ashamed after injuring themselves. It may be that anger after NSSI remains at times when the self-injury comes to light. Criticism and social unacceptability may in turn evoke feelings of shame that in some cases turn into anger. Alternatively, anger after NSSI may be prominent when the act of self-injury was unsuccessful in reducing negative affective arousal (Brown et al., 2002).

The possibility of oscillating emotions, lagged occurrence or co-occurrence of affect-states is in line with evidence of a dynamic interplay between intrapersonal NSSI functions, which include relief of negative emotions, generation of positive feelings and self-punishment (Nock & Prinstein, 2004). The evidence to date has failed to take into account the timeline of anger and other affect-states (e.g. occurrence immediately after NSSI or a few hours later).

More consideration should have also been given to the methodology: it is likely that participants were not able to accurately recall the timeline of their feeling-states. This is supported by evidence that reasons for NSSI as well as affect-states in the course of NSSI episodes may not always be explicit (Snir et al., 2015). Lists of affect-states or anger-related reasons for NSSI, as used in the papers under review, do not capture implicit emotional processes that may lie outside the conscious awareness (Nock, Prinstein & Sterba, 2009).

Ecological momentary assessment (Bolger, Davis & Rafaeli, 2003; Fraley & Hudson, 2014), a longitudinal method using real time self-report diaries, may allow for better internal validity (Snir et al., 2015, see section 5.2).

Self-injurious behaviour is determined by multiple factors and is therefore likely to serve multiple functions (Gratz, 2003). Perhaps this explains why anger was not consistently reported as the most common emotion preceding NSSI. The release of anger may be one reason to engage in NSSI, other motives may involve externalising pain, evoking a sense of control or wanting to stop racing thoughts, amongst others (Gratz, 2003). Whether or not individuals experience intense feelings of anger may also depend on the situational circumstances under which NSSI occurs (Klonsky, 2007), trait anger and a readiness to get angry (Nixon et al., 2002; Olatunji et al., 2010) and perhaps specific psychopathological processes that increase the likelihood of experiencing anger. For instance, a heightened readiness to experience anger has been found in individuals with symptoms of PTSD (Olatunji et al., 2010). Indeed, one paper in this review supported these findings: a high percentage of participants with PTSD endorsed engaging in NSSI due to feeling angry (Briere & Gil, 1998). Individuals with a history of offending have also been reported to display higher levels of anger than other psychiatric populations (Suter et al, 2002). These findings were also found by Chapman and Gordon-Dixon (2007): in their study, anger before NSSI was the affect-state most frequently reported by female inmates. One paper in this review differentiated between male and female psychiatric patients and highlighted that sex differences in levels of anger and behavioural manifestations of anger need to be considered when measuring affect-states in NSSI (Claes et al., 2007). Most papers in this review recruited female participants and the remaining studies did not control for sex as confounding variable. More generally, the papers reviewed did not take sample characteristics into account, including sex, age and psychopathology, limiting the inferences that can be drawn from the findings.

In conclusion, the accumulated evidence shows that NSSI is likely to serve as an anger management strategy and perhaps even more so in individuals who experience high levels of anger before engaging in NSSI (e.g. Kemperman et al., 1997). The reduction in feelings of anger after NSSI provides an explanation as to why individuals often keep engaging in NSSI and supports negative reinforcement theories of NSSI.

5.1. Limitations of the current review

This review has several limitations. Papers that were excluded were not broken down according to reasons excluded (e.g. duplicates, irrelevant sample). This would have enabled the readers to gain valuable insight into the type of research that has predominantly been conducted in this field.

Furthermore, specific cultural factors were not taken into account in this review. The literature search was restricted to papers written in English and therefore, it is likely that research undertaken in other cultural contexts was missed.

Despite high prevalence rates of NSSI in adolescents, only one study investigated the phenomenology of anger related to NSSI in this high-risk sample. This prevented insight into possible differences in state anger between adults and adolescents.

The search terms neither included specific methods of self-injury (e.g. cutting, burning) nor other disorder-specific terms (e.g. depression, eating disorders), terms that might have aided the detection of relevant NSSI studies.

Finally, most papers reported findings on mixed clinical populations and did not consider the unique impact of psychopathology. Only four papers investigated homogenous samples. This disparity of sample characteristics made comparisons between levels of anger and subsequent interpretations difficult.

5.2. Implications for future research

As shown by Kamphuis et al., (2007) it is important to assess levels of anger immediately after NSSI as well as a few hours later and on the next day. This would add to a better understanding of the course of anger and may help to capture other feeling states that are likely to co-occur or oscillate with anger. Naturalistic methods such as ambulatory monitoring (studying people in their natural environment), including ecological momentary assessment (Weinberg & Klonsky, 2012) may enable more accurate measurements than retrospective self-report questionnaires (Klonsky et al., 2003). Ecological momentary assessments are longitudinal self-report methods that involve electronic diaries or mobile phones to capture affect-states and behaviour. These are suggested to increase the ecological validity of findings (Trull & Ebner-Priemer, 2013). Using applications on smart phones could be particularly relevant for studies into anger in the course of NSSI. They would allow real time or near real time ratings of affect states before NSSI as well as after NSSI (Solhan, Trull, Jahng & Wood, 2009). Ecological momentary assessment has been found to be particularly useful for research into affect instability and fluctuating mood states in which multiple and frequent measurements are necessary (Trull, Solhan, Tragesser, Jahng, Wood, Piasecki et al., 2008). It may be most valuable indeed to triangulate research methods in order to investigate feelings involved in NSSI, e.g. by using ecological momentary assessments as well as retrospective self-report measures.

Future research could investigate as to whether a reduction of feelings of anger after NSSI has implications for the re-occurrence of self-injury (Klonsky, 2010). None of the studies in this review monitored the participants' anger in relation to their NSSI over a period of time in order to establish whether and how anger reinforced acts of NSSI. Ecological momentary assessments may be most useful to answer this question.

An issue worth considering may also be the possibility of reporting biases, which may be more pronounced in individuals who are asked to report socially undesirable

emotions such as anger. A review of health-related studies which incorporated social desirability (SD) scales found that in more than 50% of the studies the outcomes were influenced by social desirability (Van de Mortel, 2008). Therefore, using a SD scale alongside other self-report measures could be valuable.

Anger prior to NSSI may be more elevated in individuals who have heightened internalised anger (Nixon et al., 2002). More generally, the internalisation of anger and low anger control have been associated with higher levels of NSSI (Claes et al., 2007). Therefore, future research could benefit from assessments of both trait and state anger in individuals who engage in NSSI.

Individuals with personality disturbances and other mental health problems can experience difficulties identifying and labelling emotions (Allen & Fonagy, 2006). Feelings of anger may not have been identified correctly, at the expense of the validity of the results. Future studies could implement a number of psycho-education sessions about feeling states and the cognitive, behavioural and physical sensations involved. If this was done in advance of a study, i.e. three times within in a six-month period, the participants' reports may be more accurate and reliable. In some research designs this may not be feasible, i.e. in cross-sectional large-scale surveys.

Asking participants to identify and label emotions correctly would also require researchers to be more accurate in defining what emotions are. It was noted that in many studies in this review the experience of tension was characterised as emotional state and measured alongside anger (e.g. Kleindienst et al., 2008; Klonsky, 2009). Research into the emergence of emotions has suggested that novel or salient stimulation produces tension and physiological arousal, which is expressed as either positive or negative affect, depending on the context and cognitive appraisal (Scherer & Ekman, 2009). This suggests that, in varying degrees, tension is part of affect-states and not an emotion in itself.

Chapman and Gordon-Dixon (2007) highlighted significant differences between

individuals who injured themselves and those who attempted suicide: individuals who engaged in suicide attempts reported significantly less improvement in their negative affect-states after their attempt than individuals who engaged in NSSI without suicide intent. Therefore, transparent and clear construct definitions of NSSI and a thorough assessment of suicidality in participants would be important in the future.

5.3. Clinical Implications

Given the complexity and chronicity of NSSI as well as the high risk of suicide in individuals who engage in NSSI, identifying the most appropriate course of intervention can be challenging for clinicians. Anger, in particular, appears to be an emotion that is often expressed on the surface and yet other underlying emotions may need to be addressed as well. In terms of anger preceding NSSI, results were inconclusive, perhaps for this very reason. If, for instance, a client was more likely to engage in NSSI at times of feeling ashamed despite showing anger outwardly, the approach to treatment would differ. Treatment effectiveness may be improved by adding components of compassion-focussed therapy. Compassion-focussed approaches have been specifically developed to reduce feelings of shame and self-criticism and to increase self-compassion, kindness and self-soothing (Gilbert, 2009).

From what is known so far, the results of this review endorse the anger management function of self-injury, given that feelings of anger tended to decrease following NSSI. Treatment approaches could therefore incorporate distress tolerance, emotion regulation techniques and interpersonal problem solving skills. Dialectical Behaviour Therapy offers these interventions (Linehan, 1987), which have been shown to be effective in a variety of clinical populations (Fleischhaker, Böhme, Sixt, Brück, Schneider & Schulz, 2011; Telch, Agras & Linehan, 2001).

Interventions should also target the context in which anger occurs in order to

identify early warning signs or high-risk situations. This may help to prevent the build-up of overwhelming feelings of anger and tension. Chain analyses of events leading up to the self-injury episode have previously been recommended (Kamphius et al., 2007). However, as shown in this review, anger may not always be the most prominent emotional precipitator of self-injury. Therefore, helping clients to identify their emotions (i.e. using a diary), motives and intent for self-injury could be important for treatment planning.

Identifying emotions involved in self-injury may require accessing cognitions that tend to be linked to emotional experiences (Izard, 1992). The individual's capacity to access emotional and mental states in self and other may, however, depend on the quality of their early attachment experiences (Fonagy, Leigh, Kennedy, Mattoon, Steele, Target, et al., 1995). Specifically, in individuals with personality disorder these have been found to be deficient (Bateman & Fonagy, 2010). Treatment approaches should also take into account the aetiology and topography of clinical disorders to allow idiosyncratic formulation and interventions. For instance, for individuals with a diagnosis of BPD, Mentalisation-based approaches may be appropriate in order to improve the ability to mentalise (understanding emotions and mental states in self and other) in the context of an attachment relationship (therapeutic relationship). Improved mentalising may in turn increase the capacity to identify affect and mental states in the context of non-suicidal self-injury.

Another important step to providing effective assessment and treatment could be identifying the effect of self-injury on affect valence (Nock & Prinstein, 2004). In some cases, self-injury can lead to negative emotions such as anger, shame and guilt (Chapman & Gordon-Dixon, 2007). And yet others may experience a reduction in negative emotions (negative reinforcement) or even an increase in more positive sensations such as relief and calmness (positive reinforcement). In these cases, self-injury may excite the release of endorphins (Weinberg & Klonsky, 2012). These findings highlight the importance of exploring idiosyncratic cycles of emotions clients experience prior, during and after NSSI.

5.4. Conclusions

This review highlights that individuals who experience unbearable feelings of anger, may use non-suicidal self-injury as a strategy to manage and reduce these feelings. However, anger may not always be the most prominent NSSI precipitator. Furthermore, anger may recur after an initial moment of relief from other negative emotions, a question that was not addressed by most of the papers reviewed. Retrospective self-report, unreliable assessments tools and varying sample characteristics limit the current evidence. To date the processes and mechanisms of self-injury are unknown and therefore, the underlying mechanisms of change of different treatments remain unclear (Bateman, 2010; Cumming, Covic & Murrell, 2006). There is evidence that interventions should target both the topographical characteristics of clinical presentations (aetiology, diagnostic symptoms) and the functional aspects of behaviour in order to identify maintaining processes of self-injury (Nock & Prinstein, 2004). More extensive and high quality research is needed to add to a better understanding of the phenomenology of anger in NSSI.

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Part Two. Empirical Paper

The role of self-disgust in non-suicidal self-injury among individuals with personality disorder.

Abstract

Aims. There is growing evidence of a strong association between self-disgust and non-suicidal self-injury (NSSI). The aim of the current study was to investigate the role of self-disgust, alongside possible overlapping affect-states (shame, anger), in predicting lifetime NSSI among individuals with Personality Disorder (PD) features. This research also aimed to examine the psychometric structure of an existing self-disgust scale in this sample.

Method. A cross-sectional online survey was conducted incorporating self-report questionnaires to screen for PD and to assess self-disgust, anger, shame, sexual abuse, lifetime NSSI and functions of NSSI. One hundred and eighty-eight individuals who screened positive for PD were recruited as well as 133 subjects who screened negative for PD.

Result. Logistic regression analysis highlighted self-disgust as the single independent predictor of lifetime NSSI. Multiple regression analyses identified self-disgust as a predictor of the 'self-punishment', 'anti-suicide' and 'communicating distress' functions of NSSI. A principal component analysis of the self-disgust scale suggested that physical self-disgust explained over 50% of the variance out of the overall variability in the sample that screened positive for PD.

Conclusions. The findings suggest that self-disgust may be a significant risk factor for NSSI among individuals who screen positive for PD and indicate that self-disgust may specifically be connected with the impulse to attack and punish the self through self-injury. The effectiveness of interventions for NSSI among individuals with PD symptoms may be enhanced by examining whether self-disgust contributes to and/or maintains self-injurious behaviour. Treatment may also benefit from taking into consideration the strong visceral experiences related to self-disgust.

1. Introduction

The emotion of self-disgust has been defined as a 'profound revulsion at one's own character or actions' (Oxford Dictionary). This concept is still fairly novel in psychological research, despite previous reports of its crucial role in psychiatric illness (Phillips, Senior, Fahy & David, 1998). Self-disgust has been suggested to be a form of self-criticism with self-disgust and self-directed aggression as the emotional components and self-critical thoughts as the cognitive component (Gilbert, Clarke, Hempel, Miles & Irons, 2004). Very little research has been conducted to understand the phenomenology of the emotion of self-disgust (Smith, Steele, Weitzman, Trueba & Meuret, 2015).

From an evolutionary perspective emotions have an adaptive function (Ekman, 1999). Research in Evolutionary Psychology has provided robust evidence that external disgust enables pathogen avoidance (Tybur, Lieberman, Kurzban & DeScioli, 2013). Disgust is a response to smelling or tasting something (literally or metaphorically) repugnant, followed by a distinct facial expression and a sound such as "yuck" and the consequence of turning away or keeping a distance from the source of disgust (Ekman, 1993; 1999). Disgust is not necessarily triggered by an external signal but might be present either due to signal saturation or occur as an emotional trait, meaning disgust reappears chronically (Scherer & Ekman, 2009). External disgust has also been suggested to involve a socio-cultural component: pulling away from individuals that violate social norms might be a way of regulating social coexistence (Schienle, Ille, Sommer & Arendsay, 2014).

As opposed to external disgust, pathological self-disgust is introversive and maladaptively directed towards the self (Powell, Overton & Simpson, 2014; Schienle et al., 2014). When disgust is turned against the self, pulling away is not possible. Questions remain regarding the aetiology and function of self-disgust and how individuals regulate self-disgust.

1.1. Self-disgust in psychiatric populations

A considerable amount of research has shown that individuals suffering from depression experience higher levels of self-disgust than control groups (Powell, Simpson & Overton, 2013; Schienle et al., 2014). In a qualitative study, individuals with depression described self-disgust as an all-encompassing and permanent emotion as opposed to other more fluctuating affect-states such as anger or sadness (Powell et al., 2014). A more recent study on self-disgust dimensions in mental disorders pointed to disorder-specific predictors of self-disgust (Ille, Schöggel, Kapfhammer, Arendsay, Sommer & Schienle, 2014). Individuals with Borderline Personality Disorder (BPD) and eating disorders reported the highest levels of personal and behavioural self-disgust, compared to individuals with phobias, depression, schizophrenia and healthy individuals. The study also pointed to higher levels of self-disgust in females and individuals with a history of sexual abuse. These findings differed from previous studies, where childhood abuse was unrelated to levels of self-disgust (Rüsch, Schulz, Valerius, Steil, Bohus & Schmahl, 2011; Schienle, Haas-Krammer, Schöggel, Kapfhammer & Ille, 2013).

Trait self-disgust in BPD appears to be positively correlated with symptom severity (Schienle et al., 2013). Rüsch et al. (2011) compared levels of implicit and explicit self-disgust between individuals with BPD, individuals with post-traumatic stress disorder (PTSD), individuals with co-morbid BPD and PTSD, and healthy control subjects. No significant differences were found between the experimental groups, however, all experimental groups showed higher levels of self-disgust than the healthy control group. Psychiatric co-morbidities (anxiety, depression) and childhood abuse did not affect the above outcome. The authors suggested that implicit disgust-prone self-concepts in individuals with BPD may contribute to emotion dysregulation.

1.2. External disgust in psychiatric populations

In psychological and psychiatric research disgust proneness and sensitivity have mostly been studied in eating disorders and anxiety disorders, including phobias and obsessive-compulsive disorder (i.e. Fox & Harrison, 2008; Schienle, Schäfer, Stark, Walter, Franz & Vaitl, 2003; Tolin, Wood & Abramowitz, 2006; Van Overveld, De Jong & Peters, 2006). These specific populations tend to experience higher levels of disgust sensitivity than healthy control subjects. The association between external disgust and self-disgust has yet to be investigated.

1.3. Measurement of self-disgust

Overton, Markland, Taggart and Bagshaw (2008) were the first to develop a scale to assess self-disgust in depression. The 'Self-Disgust Scale (SDS)' measures two factors, personal and behavioural self-disgust ('disgusting self' and 'disgusting ways'). It consists of 12 items and was reported to exhibit high levels of internal consistency ($\alpha=.91$) and test-retest reliability ($r=.94$, $p>.001$). The concurrent validity was found to be weak ($r=.25$, $p>.01$).

Since the SDS was developed, concerns have been raised with regards to its internal and construct validity. The existing self-disgust scale was reported to significantly overlap with other constructs such as self-hatred and shame (Powell et al., 2014; Schienle et al., 2014). In addition, the SDS does not measure all aspects of self-disgust as it lacks items on visceral and behavioural consequences of self-disgust. Consequently, the Self-Disgust Scale was revised (SDS-R) and resulted in a scale consisting of 15 items and seven filler items (Powell, Overton & Simpson, 2015). Preliminary analyses of the SDS-R in a non-clinical college sample found a high internal consistency ($\alpha=.92$). The items loaded on three factors: physical self-disgust, behavioural self-disgust and overall disgust with the self. The structure of the SDS-R has not yet been explored in clinical populations.

1.4. Self-disgust, anger and shame

There are indications that self-disgust overlaps with shame (Ille et al., 2014; Powell et al., 2014). Shame is defined as ‘a painful feeling of humiliation or distress caused by the consciousness of wrong or foolish behaviour’ (Oxford Dictionary, 2016). Shame is central to the development of conscience and identity, alerting us to wrongdoings. It contributes to low self-esteem, problematic body image and poor self-concept (Kaufman, 1996). Shame can be an internal experience or can occur in the context of interpersonal relationships. By nature, it is an emotion that targets the integrity of the self (Kaufman, 1996), as is self-disgust (Powell et al., 2014). Both shame and self-disgust have been reported to lead to withdrawal, possibly due to socio-moral reasons (Powell et al., 2014). People who experience shame often engage in problematic behaviour to avoid feelings of shame or ‘loss of face’ (Gilbert & Procter, 2005). This is also the case for self-disgust (Powell et al., 2014). However, the preliminary work on self-disgust by Powell and colleagues highlighted possible differences between these affect-states, which may be related to embodied and visceral experiences. Self-disgust may represent more of an all-encompassing sense of self that can cause strong feelings of nausea.

Anger and self-disgust have also been suggested to be highly associated (Fox & Harrison, 2008) and difficult to distinguish (Powell et al., 2014). In Powell’s qualitative research, self-directed anger appeared to occur as a consequence of feeling disgusted with oneself. Across a variety of mental disorders, hostility, which is conceptually related to anger (Armey, Crowther & Miller, 2011), has further been reported to be one of the best predictors of self-disgust (Ille et al., 2014).

To add to the above complexity, research has suggested that anger commonly masks underlying feelings of shame (Hjedenberg & Andrews, 2011; Klonsky, 2009; Tangney, Wagner, Fletcher & Gramzow, 1992). Individuals who are prone to feelings of shame have been suggested to experience higher levels of anger arousal (Tangney et al., 1992). The

evidence to date highlights the necessity to investigate self-disgust in association with shame and anger.

1.5. Non-suicidal self-injury (NSSI)

NSSI is the 'deliberate, direct destruction or alteration of body tissue, without conscious suicidal intent but resulting in injury severe enough for tissue damage to occur' (Gratz, 2003). Self-injurious behaviour occurs trans-diagnostically and is particularly prevalent in individuals with personality disorder (Konsky, Oltman & Turkheimer, 2003), eating disorder, affective disorders and substance use problems (Haw, Hawton, Houston & Townsend, 2001; Konsky et al., 2003; Paul, Schroeter, Dahme & Nutzinger, 2002). NSSI is not always measured and defined consistently, which makes comparisons between samples difficult (Klonsky & Muehlenkamp, 2007).

1.6. Personality disorder and NSSI

Research into personality development is a multidisciplinary approach, drawing from a variety of theories and disciplines including social learning theory (Bandura & Walters, 1963), temperament theory (Buss & Plomin, 1975), genetics (Loehlin, 1992), lifespan personality development (Caspi & Roberts, 2001), psychodynamic theories (Cameron & Rychlac, 1985; Freud, 1927), psychosocial development theory (Erikson, 1963) and attachment theory (Bretherton, 1992). Personality is widely understood to lie along a spectrum of functioning (Widiger, 2011). As such, personality psychopathology may represent maladaptive and extreme levels of general personality traits. In Great Britain the prevalence of personality disorders in the general population is approximately 4.4% (Coid, Yang, Tyrer, Roberts & Ullrich, 2006).

The evidence-base highlights that personality disorders and other psychiatric co-morbidities are significant risk factors for NSSI and suicidal behaviour (Krysinska, Heller, De

Leo, 2006). Individuals who have previously engaged in NSSI have a 66-fold higher suicide risk than the general population (Hawton, Zahl & Weatherall, 2003). Even though the current research did not specifically use a screen to identify individuals with Borderline Personality Disorder (BPD), the lifetime prevalence of NSSI has been reported to be particularly high amongst this population (47.6%) (Chapman, Specht & Cellucci, 2005). BPD is characterised by emotion regulation deficits, impulsivity, interpersonal difficulties, repeated NSSI as well as suicidal ideation (Lieb, Zanarini, Schmahl, Linehan & Bohus, 2004). Traumatic childhood experiences and genetic factors are likely to contribute to the aetiology of emotion dysregulation in BPD (Chapman et al., 2005). Emotion dysregulation is thought to be one of the key factors that precipitates and maintains NSSI (Gratz, 2007). Emotional regulation refers to the ability to control/inhibit behaviours that are associated with heightened emotions rather than the ability to control or get rid of elevated affect-states (Linehan, 1993). NSSI has been associated with reduced emotional awareness (Evren & Evren, 2005). A variety of treatment approaches have been developed to reduce self-injurious behaviour in PD and other psychiatric populations, yet their effectiveness varies and the chronic and complex nature of NSSI has yet to be fully understood (Cumming, Covic & Murrell, 2006; Klonsky et al., 2007).

1.7. Emotions associated with NSSI

The alleviation of negative affect and self-punishment has been reported to be the most common functions of NSSI (Gratz, 2007; Klonsky, 2007). A range of negative emotions has been highlighted to precede and/or succeed self-injury, including anger, sadness, self-disgust and shame (Kleindienst et al., 2008). Self-injurious behaviour often becomes chronic and therefore, models of maintenance have been proposed which place an emphasis on negative and positive reinforcement processes (e.g. decrease of negative affect and increase of desired affect state) (Nock & Prinstein, 2004).

1.7.1. Self-disgust in NSSI. So far only a few studies have been conducted to investigate the relationship between self-injury and the emotion of self-disgust. Qualitative research has highlighted that individuals who experience self-disgust make attempts to avoid these unbearable feelings (Powell et al., 2014). NSSI may serve as a strategy to avoid or reduce feelings of self-disgust. NSSI urges in response to self-disgust have been reported narratively by a sample of 17 women with BPD (Abdul-Hamid, Denman & Dudas, 2014), yet statistical analyses of this correlation were non-significant. Only one study so far compared levels of self-disgust before and after NSSI (Kleindienst et al., 2008). The sample comprised female psychiatric patients with a diagnosis of BPD. Interestingly, self-disgust did not diminish following self-harm, which contrasted with other emotions such as anger. The most recent study into self-disgust and self-injury found that, in a sample of college students, self-disgust fully mediated the relationship between NSSI and depressive symptomatology (Smith et al., 2015). Up to now, only qualitative research into self-disgust and functions of NSSI has been conducted (Powell et al., 2014). NSSI may serve as a strategy to reduce feelings of self-disgust which are experienced as a threat to the integrity of the self (Benson, Boden & Vitali, 2015). According to the authors, NSSI may also function as a way of making messy and jumbled feelings of self-disgust visible and tangible. Further research into the association between self-disgust and functions of NSSI is needed.

1.7.2. Anger in NSSI. Trait anger appears to be heightened in individuals who engage in NSSI (Lavana et al., 2012). Furthermore, elevated levels of anger increase the likelihood of individuals engaging in NSSI (Nock, Prinstein & Serba, 2009). Various studies have pointed to NSSI as a means of expressing self-directed anger in order to regulate underlying feelings of self-hatred (Brown, Comtois & Linehan, 2002; Klonsky, 2007). The systematic literature review of this thesis highlighted that anger may be a prominent emotional antecedent of self-injury. Depending on the individual's proneness to experiencing anger as well as situational and functional aspects of NSSI, other affect-states

may be relevant. Research into the course of anger in NSSI episodes consistently points to a reduction of anger following self-harm, endorsing the anger management function of NSSI (e.g. Kamphuis, Ruyling & Reijntjes, 2007; Kemperman, Russ & Shearin, 1997; Weinberg & Klonsky, 2010). However, it is likely that feelings of anger in NSSI oscillate with other affect-states and/or co-occur (see section 1.4.).

1.7.3. Shame in NSSI. Feelings of shame are significantly associated with self-injury and appear to occur in the context of self-persecuting thoughts (Gilbert, McEwan, Irons, Bhundia, Christie, Broomhead et al., 2010). Shame and self-criticism often co-occur with self-contempt (Gilbert et al., 2010), which possibly increases the likelihood of NSSI. Bodily shame in particular has been shown to predict self-injurious behaviour in women (Milligan & Andrews, 2005). Furthermore, the evidence suggests that shame frequently follows NSSI acts (Chapman & Dixon-Gordon, 2007; Gratz, 2003).

1.8. Focus of the current research

Given that the SDS-R (Powell et al., 2015) has never been used with clinical populations, the current research aims to explore the structure of this scale in a sample of individuals who screened positive for PD.

Very little research into the role of self-disgust in NSSI has been conducted (Abdul-Hamid et al., 2014; Smith et al., 2015). There is emerging evidence that self-disgust, shame and anger might partially overlap, hence the second aim of this research is to examine the relationship between these specific affect-states and lifetime NSSI. The role of self-disgust, anger and shame in predicting functions of NSSI is of considerable interest as well.

1.9. Exploratory research question and hypotheses

Hypothesis 1

It is hypothesised that levels of self-disgust will be significantly higher in individuals

who screened positive for PD than participants who screened negative for PD.

Hypothesis 2

It is hypothesised that the three emotions of self-disgust, anger and shame will be significantly associated with each other. It is hypothesised that the higher individuals with PD symptoms score on self-disgust, the higher their scores on shame and anger.

Hypothesis 3

It is hypothesised that higher levels of self-disgust, anger and shame will significantly increase the likelihood of lifetime non-suicidal self-injury.

Exploratory research question

What is the association between self-disgust and functions of NSSI?

2. Method

2.1. Design

This study used a cross-sectional observational design. An online survey consisting of eight standardised measures was developed. Participants were recruited in a variety of London-based mental health services as well as through social media and research recruitment websites.

2.2. Joint work and ethics

This research was conducted in conjunction with a research project investigating the association of self-disgust and adverse childhood experiences, which was carried out as part of the Doctorate in Clinical Psychology at University College London (Drea, 2016) (see Appendix B for outline of joint work).

Ethics approval was obtained from the NRES Committee London – Hampstead in July 2015 (REC reference: 15/LO/1032; Appendix C).

2.3. Sample size calculation

One of the aims of this research was to explore the structure of the SDS-R (Powell et al., 2015) in a sample that screened positive for a personality disorder. A participant-to-item ratio of 5:1 was reported sufficient in order to evaluate the psychometric properties of a scale (Gorsuch, 1983). This research aimed to recruit at least 75 participants who screened positive for PD since the SDS-R consists of 15 items. To allow meaningful comparisons, a similar size control group was recruited. G*Power 3.1 (Faul, Erdfelder, Lang & Buchner, 2007) was also used to calculate the sample size needed in order to achieve a small to medium effect size ($d=.15$). The alpha level was conventionally set at .05, the power at 80%. For a linear regression analysis using three independent predictors a sample size of 77 participants was needed.

2.4. Procedure

2.4.1. Development of understanding of self-disgust. Initially, one aim of the current research was to develop a more valid self-disgust assessment tool than existed at the time. Given that little was known about the experience of self-disgust, service users with a diagnosis of PD were invited to take part in a consultation group to gain a better understanding of this affect-state and to receive advice on how to best measure self-disgust. A consultation group was also undertaken with expert clinicians who worked in a personality disorder service. Both service users and clinicians agreed that a self-disgust scale should incorporate items on visceral experiences of self-disgust as well as more specific items on behavioural consequences of self-disgust. The face validity of the newly developed scale was examined by two researchers who were experts in the field of PD and self-disgust, respectively (see Appendix D for full scale). Unfortunately, once the development of the new self-disgust scale was completed, a revised version of the SDS became available (Powell et al., 2015) that was very similar. For the sake of the originality

of this research (Gelling & Rodriguez-Borrego, 2014), we discarded our newly developed scale in favour of the revised SDS (SDS-R).

2.4.2. Participant inclusion/exclusion criteria. Participants aged 18 or above were eligible to take part. Given the nature of the online survey, it was not possible to select participants based on specific demographic features. Anyone within and outside of Europe was welcome to take part, provided they were able to comprehend English. The aim was to recruit individuals who screened positive for PD (see section 2.5.1.) as well as individuals who screened negative for PD (control subjects).

2.4.3. Recruitment. A research website was created which provided information about the study and relevant background information. Recruitment was facilitated through snowball and opportunity sampling. London-based mental health services for individuals with PD were contacted and brief on-site presentations about the research were held (see Appendix E for the therapist information sheet). Service managers agreed to put up posters in waiting areas and clinicians were asked to hand out flyers to their clients where appropriate. In order to increase participant rates, the research was also advertised on social media websites such as Facebook (e.g. in PD support groups) and Twitter as well as on research recruitment websites. Posters were also put up in public places such as cafés, restaurants and universities. Participants were advised to contact the researchers if they wanted to be sent a paper copy of the survey with a pre-stamped envelope. Only one participant requested a paper copy and did not return the completed questionnaire pack.

2.4.4. Consenting. The main concern was related to the distress that might arise in participants completing the battery of questionnaires. Individuals with possible personality disorder (and other mental health problems) were considered to be particularly vulnerable to strong emotional reactions when faced with questions on self-disgust and adverse childhood experiences. Therefore, participants were informed of the possibility of this on the consent form (Appendix F). More specifically, participants were advised not to take

part, or participate at a later time, if they were feeling distressed at the time (Information Sheet, Appendix G). Participants were able to withdraw from participating at any time. Furthermore, each web page displayed a help button which participants could click on to be re-directed to a page with a list of stress management strategies and contact numbers of various forms of support (Samaritans, A&E, GP, allocated mental health care professional, if applicable). Participants were also provided with the researchers' telephone number and e-mail address and encouraged to contact them directly should they feel highly distressed (distress management sheet, Appendix H).

2.4.5. Compensation. Due to the expectation of a high response rate, participants were not compensated monetarily. Instead, a donation of £1 to one of three charities (Emergence, NSPPC, Mind) was offered as incentive for completing the survey. Participants were asked to select their charity of choice after all measures were completed.

2.4.6. Data storage and protection. All measures were uploaded to the Patient Outcome Database (POD), a system developed by Professor Peter Fonagy (UCL). Through a link displayed on the self-disgust research website, participants were forwarded to the POD website. Participants were able to complete the survey electronically from a computer, tablet, or smart phone. The data was recorded and held on the Patient Outcome Database.

The data was held anonymous at all times to ensure data protection. No names or addresses of any participants were recorded. POD meets all NHS standards for data protection and does not contain any personal identifiable information.

2.5. Measures

2.5.1. Demographic information. *Demographics:* Information on age, gender, ethnicity and country of origin was gathered.

Standardised Assessment of Personality - Abbreviated Scale/SAPAS (Fok, Seegobin, Frissa, Hatch, Hotopf, Hayes et al., 2015): The SAPAS is a brief self-report screen for

personality disorders, consisting of eight items. The response format is dichotomous (yes = 1; no = 0) and the sum of scores can range from zero to eight. The SAPAS was validated on 60 psychiatric patients showing moderate internal consistency ($\alpha=.68$) and high sensitivity (94%) and specificity (85%). With a cut-off score of three, 90% of cases were correctly ascribed a personality disorder. Its validity and usefulness has been replicated by Germans, Van Heck and Hodiament (2012). The SAPAS was used in order to screen participants for a personality disorder (see Appendix I for the full scale), as 5% of the normal population meet criteria for a PD (Coid et al., 2006). For the purpose of this study a more rigorous cut-off score of four was used in order to reduce the likelihood of a type I error. However, given that the SAPAS is not a rigorous diagnostic assessment tool for PD, the current study refrains from ascribing participants a personality disorder. Individuals who had a cut-off score of four or above are referred to as 'individuals who screened positive for PD'. The estimate for the time taken to complete this questionnaire was two minutes.

2.5.2. Self-Disgust and disgust propensity. *The Self-Disgust Scale Revised/SDS-R* (Powel et al., 2015): Preliminary analyses of the SDS-R in a non-clinical sample found high internal consistency ($\alpha=.92$). The items loaded on three factors: physical self-disgust, behavioural self-disgust and overall disgust with the self. A full psychometric evaluation is pending (see section 1.3.). Higher scores indicate higher levels of self-disgust (approximately five minutes to complete; Appendix J).

The Disgust Propensity and Sensitivity Scale-Revised/DPSS – R (van Overveld et al., 2006): The DPSS-R consists of 16 item and aims to assess the frequency of disgust experiences (disgust propensity) and the emotional impact of disgust experiences (disgust sensitivity). Participants respond on a five-point Likert scale (0=never, 5=always). Both subscales have shown adequate internal consistency (disgust propensity: $\alpha=.84$; disgust sensitivity: $\alpha=.83$; Olatunji, Cisler, Deacon, Connolly & Lohr, 2007). This scale was included in order to assess the concurrent validity of the SDS-R. (Approximately four minutes to

complete; Appendix K)

2.5.3. Shame. *The Experience of Shame Scale/ESS (Andrews, Qian & Valentine, 2002):* With 25 items the ESS examines eight areas of shame. The subscale 'characterological' shame covers four areas (shame regarding personal habits, manner with others, the sort of person one is and personal ability). The ESS also assesses three areas of behavioural shame (shame about doing something wrong, saying something stupid and failing in competitive situations) as well as bodily shame. Each item is rated on a four-point Likert scale in response to how the participant has felt during the past year. Higher scores indicate higher levels of shame. High internal consistency ($\alpha=.92$) and test-retest reliability ($r=.83$) were reported (Andrews et al., 2002). (Approximately five minutes to complete; Appendix L)

2.5.4. Anger. *The Clinical Anger Scale/CAS (Snell, Gum, Shuck, Mosley & Hite, 2013):* The CAS is designed to measure the syndrome of clinical anger. The scale consists of 21 items which measure the following symptoms: anger now, anger about the future, anger about failure, anger about things, angry-hostile feelings, annoying others, angry about self, angry misery, wanting to hurt others, shouting at people, irritated now, social interference, decision interference, alienating others, work interference, sleep interference, fatigue, appetite interference, health interference, thinking interference, and sexual interference. The answer format involves 21 groups of statements (four statements per group). Participant are asked to select the single statement that best described how they feel. Each group of statements is scored on a four-point Likert scale, higher scores corresponded to greater clinical anger. The scale was reported to have high internal consistency ($\alpha=.94$) and high test-retest reliability ($r=.78$) (Snell et al., 2013). Convergent validity was also found to be satisfactory: strong correlations were found between the CAS and Spielberger's state and trait anger scales (Spielberger, 1999). (approximately five minutes to complete; Appendix M)

2.5.5. Self-injury. *The Inventory of Statements about Self-Injury (ISAS)* (Klonsky & Glenn, 2009): The ISAS assesses both the lifetime status of NSSI and functions of self-injury. If one or more self-injurious behaviour is endorsed (i.e. banging, cutting, hair pulling) respondents are asked to complete the second part of the questionnaire, which assesses two overarching functions of self-injury using 13 sub-scales: interpersonal functions (autonomy, interpersonal boundaries, interpersonal influence, peer-bonding, revenge, self-care, sensation seeking, toughness) and intrapersonal functions (affect-regulation, anti-dissociation, anti-suicide, marking distress, self-punishment). The response options are 0-not relevant, 1-somewhat relevant and 2-very relevant. The questionnaire was validated on 235 young adults showing high internal consistency ($\alpha=.85$) and high test-retest reliability ($r=.85$) for the behavioural sub-scale. The internal consistency was also high in both functional sub-scales ($\alpha =.88$ and $\alpha =.80$, respectively). For the purpose of this research the lifetime NSSI status (yes/no) was calculated and participants were categorised into two groups (NSSI vs. no NSSI). The second part of the ISAS (self-injury functions) was also extracted for statistical analysis. Higher scores indicated higher relevance of each function. (approximately nine minutes to complete; Appendix N)

Originally, the aim was to investigate predictors of intra- and interpersonal functions of NSSI. However, inspection of the items subsumed under interpersonal and intrapersonal functions raised questions about the meaningfulness of this broad categorisation. For instance, the item 'seeking care or help from others' suggests wanting to be close to others, whereas the item 'establishing a barrier between myself and others' indicates the opposite, i.e. pushing others away. Both items are merged into the overarching factor 'interpersonal functions'. Furthermore, items related to the function 'self-care' are also subsumed under 'interpersonal functions' (Klonsky & Glenn, 2009). From a clinical perspective it was felt they were more likely to mirror an intrapersonal function of NSSI. In order to ensure the internal and interpretive validity of the results, an exploratory

factor analysis with the current PD sample was conducted (see Appendix O for rationale and details of the results). The results deviated from the original ISAS in as much as 10 instead of 13 functions were extracted. An overarching two-factor solution was not justifiable. Two items were deleted. The following 10 NSSI functions were found, five of which were consistent with the original ISAS: pulling others close, pushing others away, showing strength, passive aggression, anti-suicide, self-care, self-punishment, communicating distress, affect regulation and anti-dissociation. These 10 factors were used for the statistical analyses.

2.5.6. Childhood sexual abuse. *The Child Abuse and Trauma Scale/CATS (Sanders & Beckerlausen, 1995):* The CATS is a 38-item scale. Three subscales assess different aspects of adverse childhood experiences: negative home environment/neglect, punishment, and sexual abuse. On a scale of zero to four (0-never; 4-always) participants rate how often they experienced a particular abusive experience during their childhood and adolescence. For the purpose of this research the sexual abuse subscale was used, as extensive research has indicated that sexual abuse is one of the main risk factors of NSSI (e.g. Klonsky & Moyer, 2008). This subscale consists of six items (see Appendix P). The internal consistency of the sexual abuse subscale of the CATS was reported to be adequate ($\alpha=.76$; Kent & Waller, 1998), its re-test reliability has also been demonstrated ($r=.85$; Sanders & Beckerlausen, 1995). More detailed outcomes related to the full scale are reported as part of the research conducted in conjunction with the project at hand (Drea, 2016).

3. Data analysis

The data was retrieved from the POD in the form of an Excel spreadsheet and was subsequently imported into SPSS V.23 for statistical analysis.

3.1. Preliminary Analyses

3.1.1. Missing data. In order to prevent participants from skipping questions, a function was incorporated in the online survey that prevented participants proceeding to the next questionnaire if items were left unanswered (not applied to the demographic section). Missing data therefore refers to participants who dropped out. The survey was fully completed by 321 of 526 participants. 205 participants did not complete the survey and were excluded from the analysis. A Chi-Square test revealed a non-significant relationship between survey completion and PD screen ($\chi^2(1) = 0.058, p=.810$), indicating that individuals who screened positive for PD (36.5%) were as likely to drop out as the control subjects (35.4%). An inspection of the dataset showed that participants tended to drop out towards the end of the survey. The statistical tests were analysed excluding cases listwise to minimise possible errors induced by missingness and to maximise comparability across analyses (Field, 2009). The exception were five participants who fully completed the survey but did not state their sex. These participants were included in statistical analyses despite their single missing data point in order to retain valuable data.

For the purpose of the principal component analysis of the SDS-R, both survey completers and participants who dropped out were included in the analysis to increase the statistical power by using all the available data (Roth, 1994).

3.1.2. Normality tests. Descriptive analyses of the predictor variables (SDSR-PD, ESS, CAS, CATS sexual abuse sub-scale) were conducted separately for the sample that screened positive for PD (N=188) and the sample that screened negative for PD (N=133) in order to test the assumption of normality. In the sample with PD symptoms none of the measures met the assumption. Problems with either Skewness, Kurtosis or both were noted (Table 1). Within the control sample only the ESS exhibited a normal distribution. Self-injury functions assessed by the ISAS were only examined within the group of individuals with PD symptoms who reported engaging in NSSI (N=144). None of the self-injury functions met the assumption of normality (Table 2). Square root transformations

(for positive skewness) and log transformations (for negative skewness) of the non-normal variables were conducted and tests of normality re-run. The transformations largely did not yield satisfactory results and most variables still did not meet the assumption of a normal distribution.

Table 1

Skewness and Kurtosis of non-normal predictor and outcome variables

Variable	Positive Screen for PD (N=188)		Negative Screen for PD (N=133)	
	Skewness	Kurtosis	Skewness	Kurtosis
SDS-R PD (self-disgust)	-.045 (SE=.177)	-.997 (SE=.353)	.639 (SE=.210)	-.486 (SE=.417)
ESS (shame)	-.595 (SE=.177)	-.448 (SE=.353)	-	-
CAS (anger)	.897 (SE=.177)	.181 (SE=.353)	1.547 (SE=.210)	2.459 (SE=.417)
CATS sex. ab.	2.244 (SE=.177)	5.652 (SE=.353)	3.406 (SE=2.10)	14.72 (SE=.417)

Note. PD=personality disorder

Table 2

Skewness and Kurtosis of NSSI functions among individuals who screened positive for PD

Variable	Positive screen for PD and NSSI (N=144)	
	Skewness	Kurtosis
Pulling others close	4.059 (SE=.207)	17.019 (SE=.411)
Pushing others away	2.034 (SE=.206)	3.946 (SE=.408)
Showing strength	1.784 (SE=.206)	2.650 (SE=.408)
Passive aggression	2.195 (SE=.206)	5.539 (SE=.408)
Communicating distress	.609 (SE=.204)	-.546 (SE=.406)
Affect regulation	-.935 (SE=.206)	-.222 (SE=.408)
Self-punishment	-.915 (SE=.208)	-.371 (SE=.413)
Self care	1.207 (SE=.206)	.450 (SE=.410)
Anti dissociation	.384 (SE=.205)	-1.336 (SE=.407)
Anti suicide	.468 (SE=.206)	-1.002 (SE=.410)

Note. PD=personality disorder; NSSI=non-suicidal self-injury

3.1.3. Differences between participants who completed and dropped out. Due to the high number of participants who dropped out (40.7%, N=205), statistical analyses were conducted to examine possible differences between these groups. Independent t-tests (Howell, 2007) were calculated for continuous variables, and chi-squared tests (Yates, 1934) for categorical variables. The assumption of equality of variances was met in all t-tests, as shown by the Levene's test (Levene, 1960). A significant difference in self-disgust was found between completers (M=53.3; SD=21.8) and participants who dropped out (M=49.1; SD=19.9); $t(476)=-2.12$, $p=.039$, BCa 95% CI [-8.13, -.515], Cohen's $d=.2$. These results suggest that individuals who dropped out reported lower levels of self-disgust than individuals who completed the survey. No significant difference in scores of self-reported shame, anger and PD symptoms were found (see table 3). There was also no significant association between survey completion and age, survey completion and gender and survey completion and ethnicity.

Table 3

Differences between survey completers and participants who dropped out

Variable	<u>Completed</u>		<u>Dropped out</u>		p-value
	M	SD	M	SD	
Self-disgust	53.3	21.8	49.1	19.9	.039*
Shame	67.5	20.1	67.9	16.9	.93
Anger	11.8	10.2	11.5	10.8	.79
PD symptoms	3.9	1.7	3.8	1.7	.43

Note. NSSI=non-suicidal self-injury; N=144; *p<.05

3.2. Sample characteristics

3.2.1. Participants. Within the sample with PD symptoms (N=188), the majority of participants who completed the survey were female (N=148, 78.7%), fewer were male (N=30, 16%) and very few of participants identified as transgender (N=5, 2.7%). Five participants did not state their sex. The majority of the sample was between 18 and 34 years old (N=144, 76.6%). Eighty percent of participants were White British or White Other (Table 4). Over half of the participants came from Western Europe (51.1%) and 30.3% reported North America as their country of origin.

Similar distributions occurred in the sample that screened negative for PD (N=133; Table 4) with 106 females (N=79.7%), 26 males (N=19.5%) and one person transgender. Seventy-three percent were aged between 18 and 34 and 75.2% were White British or White other. Over half of participants reported being from Western Europe (57.1%) and a located third residing in North America (33.1%).

For statistical analyses with the sample that screened positive for PD, only males and females were included due to the small number of individuals who were transgender (N=5). In regression analyses substantial problems in making variance inferences have been reported for very small sample sizes at the group level (Bell, Morgan, Kromrey & Ferron, 2010). Where the variable gender was included, the sample size was n=178, instead of

n=188 (five transgender cases, five cases with missing information on sex).

Table 4

Participant Characteristics

Characteristic	Positive screen for PD (N=188)		Negative screen for PD (N=133)	
	Frequency	Percentage	Frequency	Percentage
Ethnicity				
White (British/Other)	150	79.8	100	75.2
Mixed (Black, Asian, British)	12	6.4	12	9.1
Asian	8	4.4	7	5.4
Black, Black British	2	1	5	3.8
Chinese, any other	13	7	9	6.8
Area of origin				
North America	57	30.3	44	33.1
South America	2	1.1	0	0
Western Europe	96	51.1	76	57.1
Sub Saharan Africa	1	.5	0	0
Eastern Europe	8	4.3	1	.8
Australasia	7	3.7	3	2.3
South East Asia	14	7.4	8	6
Age				
18-24	72	38.3	48	36.1
25-34	72	38.3	49	36.8
35-44	20	10.6	16	12
45-54	10	5.3	13	9.8
55-64	9	4.8	2	1.5
65+	3	1.6	5	3.8

Note. PD=personality disorder

3.2.2. Self-injury. One-hundred and forty-four of individuals who screened positive for PD (N=188) reported engaging in NSSI. Forty-three percent of these individuals endorsed cutting as their main form of self-injury, followed by hitting the self and severe scratching (Table 5). The majority endorsed always or sometimes experiencing pain during

their self-injury (86.2%) and reported to self-harm without anyone present (73.6%). Sixty-five percent reported a short time lapse of one hour or less between the NSSI urge and the NSSI act. The self-reported average age of onset of NSSI was 12 years and six months (Range 5-45 years, SD=5.8). A significant relationship between lifetime NSSI status and PD status was found $\chi^2(1)=20.13$, $p<.001$. Participants who screened positive for PD were significantly more likely to report NSSI (67.3%) than individuals who screened negative for PD (32.7%). Furthermore, participants with PD symptoms who endorsed lifetime NSSI had significantly higher levels of self-disgust ($M=51.9$, $SD=16.8$) than participants who did not report NSSI ($M=36.7$, $SD=15.3$); $t(186)=-5.68$, $p=.001$, BCa 95% CI [-20.5, -9.6], Cohen's $d=.94$.

Table 5

Main form(s) of NSSI (multiple responses possible)

Form of NSSI	N participants	Percentage
Cutting	62	43.1
Hitting/Banging	32	22.2
Severe Scratching	23	16
Interfering with wound healing	20	13.9
Biting	13	9
Burning	8	5.6
Swallowing substances	8	5.6
Carving/pinching or pulling hair	6	4.2
Rubbing skin against surface	4	2.8
Sticking self with needles	0	0

Note. NSSI=non-suicidal self-injury; N=144

3.3. Psychometric analysis of the SDS-R

To examine the structure of the SDS-R (Powell et al., 2015) in the sample that screened positive for PD, a Principal Component Analysis (PCA) was carried out using Direct

Oblimin rotation, an oblique method that assumes the components are correlated (Brown, 2009b; Gorsuch, 1983; Overton et al., 2008). The literature suggests choosing a PCA over an exploratory factor analysis (EFA) in cases where no robust theory about the relationship between variables exists (Brown, 2009a). A full psychometric evaluation of the SDS-R has never been carried out and its structure never explored in a sample of individuals who screened positive for PD. Therefore, a PCA was considered appropriate. Furthermore, a PCA was chosen in order to allow comparisons to the PCA carried out by Powell and colleagues (2015), who did his analysis with a sample of graduate students. Kaiser's Eigenvalue criterion and the scree test were used to extract the optimal number of components (see Ledesma & Valero-Mora, 2007).

The internal consistency of the SDS-R PD and its subscales was calculated and its association with the ESS (Andrews et al., 2002) and the DPSS-R (van Overveld et al., 2006) was examined in order to establish the concurrent validity of the SDS-R PD.

3.4. Group differences

To examine group differences between the two samples, independent t-tests were used for the continuous variables (self-disgust, anger, shame, sexual abuse, disgust propensity/sensitivity). In addition, an independent t-test was calculated to investigate possible differences in sexual abuse between individuals with and without NSSI.

3.5. Logistic regression

A logistic regression using the sample with PD symptoms (N=188) was calculated with lifetime NSSI status as outcome variable and self-disgust, shame and anger as predictor variables. This statistical test is appropriate when modelling the relationship between a categorical variable and a set of co-variables (Hosmer & Lemeshow, 2000). A post-hoc logistic regression using all participants (N=321) was also conducted because

individuals with and without NSSI were more evenly distributed, conducive to the validity and stability of the logistic regression model (Moineddin, Matheson & Glazier, 2007).

3.6. Multiple regression

Multiple regression analyses (Johnson & Wichern, 2007) were conducted to establish the validity of self-disgust, shame and anger in predicting self-injury functions in individuals who screened positive for PD (N=144). Of interest were the 10 NSSI functions that were extracted from the ISAS (Klonsky & Glenn, 2009; Appendix O). These functions constituted the outcome variables. Gender and/or childhood sexual abuse were entered as co-variables, provided they were found to significantly correlate with the respective outcome variable.

Parametric tests (correlations, t-tests, multiple regression) were run incorporating bootstrapping (resampling) methods because assumptions for these tests were only partially met (see section '4.1.2. Normality tests'). This method estimates confidence intervals based on 1000 bootstrap samples (IBM bootstrapping SPSS 22) with the purpose of improving the sample distribution (Efron, 1981). Bootstrapping of parametric tests was chosen instead of non-parametric tests because the latter are known to lack power which increases the likelihood of a type I error (Nachar, 2008). Furthermore, research into bootstrapping of non-normal data has provided strong indications that after bootstrapping the sample distribution leans towards normality (Sufahani & Ahmad, 2012).

4. Results

4.1. Evaluation of the structure of the SDS-R

4.1.1. Principal component analysis. A principal component analysis (PCA) was

conducted in order to investigate the structure of the 15-item SDS-R in the sample that screened positive for PD (N=264). The Kaiser-Meyer-Olkin measure confirmed the sampling adequacy for the analysis, KMO=.94 (Field, 2009). Bartlett's test of sphericity $\chi^2(105)=3100.53$, $p<.001$, indicated that correlations between items were sufficiently large for a factor analysis. In order to test for collinearity the determinant value was examined (Field, 2009). The value of 0.0001177 (greater than the necessary value of 0.00001) suggested no multicollinearity. An initial analysis indicated a two-component solution as assessed by the Kaiser's criterion and the scree plot. Four items double-loaded on both components (2, 5, 7, 9). Item two ('I am proud of who I am'), five ('I can't stand being me') and nine ('People avoid me') loaded almost equally high on component one and two (table 6). Salient loadings were low. The face validity of these items also did not support aspects specific to self-disgust. Therefore, these three items were removed (Fabrigar & Wegener, 2012). Item seven ('I am revolting for many reasons') displayed a considerably higher loading on component one and upon inspection appeared to be closely related conceptually (Brown, 2009a; Matsunaga, 2010). Therefore, it was retained within component one.

A final PCA was conducted with the remaining 12 items. Overall the two components explained 68.3% of the variance. The rotated solution showed seven items (1, 7, 8, 12, 15, 19, 21) with salient loadings $>.5$ on component one (explaining 57.5% of the variance) and five items (3, 11, 14, 18, 22) with salient loadings $>.5$ on component two (explaining 10.8% of the variance). Items in component one were related to physical self-disgust, items in component two aligned to behavioural self-disgust, altogether forming a new scale - the SDS-R PD (table 7). For the purpose of subsequent statistical analyses in the current study, the SDS-R PD scale was used.

Table 6

PCA initial result – SDS-R

Item	Component	
	1	2
19	.952	
21	.885	
15	.868	
8	.834	
1	.678	
7	.579	.358
12	.572	
5	.507	.430
9	.355	.340
18		.899
11		.846
3		.812
22		.705
14		.592
2	.401	.481

Table 7

PCA final results – SDS-R PD

Item	Component	
	1	2
19	.947	
21	.880	
15	.862	
8	.836	
1	.678	
7	.581	.363
12	.576	
18		.891
11		.820
3		.819
22		.712
14		.624

4.1.2. Internal consistency. The internal consistency of the SDS-R PD was high ($\alpha=.93$). The physical self-disgust component also displayed a high internal consistency ($\alpha=.92$) and the behavioural self-disgust component was satisfactory ($\alpha=.87$).

4.1.3. Concurrent validity. The SDS-R PD showed a moderate positive relationship with the DPSSR-R $r=.467$, $p<.001$, BCa 95% CI (.34, .58). This indicated that self-disgust and disgust propensity/sensitivity measured distinct constructs. The association between the SDS-R PD and the ESS was $r=.759$, $p<.001$, BCa 95% CI (.70, .81), a moderate to high positive relationship, indicating that similar, yet still different constructs were measured.

4.2. Group differences

4.2.1. Differences in study constructs between the samples. Individuals who screened positive and negative for PD significantly differed in their levels of self-disgust [$t(318)=-8.57$, $p=.001$, 95% BCa CI (-22.54, -14.55), Cohen's $d=.96$], shame [$t(319)=-7.99$, $p=.001$, 95% BCa CI (-20.9, -13.1), Cohen's $d=.92$], anger [$t(316)=-8.9$, $p=.001$, 95% BCa CI (-

10.1, -6.5), Cohen’s $d=.91$] and disgust propensity/sensitivity [$t(315)=-5.6$, $p=.001$, 95% BCa CI (-9.16, -4.38), Cohen’s $d=.62$]. Individuals with PD symptoms had significantly higher scores on self-disgust, shame, anger and disgust propensity/sensitivity than individuals who screened negative for PD (table 8).

Table 8

Differences in study constructs between the PD and control sample

Outcome	Positive screen for PD (N=188)		Negative screen for PD (N=133)	
	Mean	Standard Deviation	Mean	Standard Deviation
Self-disgust	48.3	17.34	33.9	13.5
Shame	74.6	17.89	57.6	18.94
Anger	15.3	11.31	7.1	5.73
Disgust propensity	42.7	11.53	35.9	9.95

Note. PD=personality disorder

4.2.2. History of sexual abuse. A significant difference in sexual abuse was found between the sample with PD symptoms ($M=2.69$, $SD=4.52$) and the sample without PD symptoms ($M=1.47$, $SD=2.95$); $t(316)=-2.89$, $p=.003$, 95% BCa CI [-2, -.44], Cohen’s $d=.32$. Individuals who screened positive for PD reported significantly more sexual abuse than individuals in the control group. Despite a trend in the data within the sample endorsing PD symptoms, no significant difference in sexual abuse was found between individuals who reported self-injury ($M=3$, $SD=4.69$) and those who did not engage in self-injury ($M=1.64$, $SD=3.8$); $t(186)=-1.97$, $p=.053$, BCa 95% CI [-2.65, 0.00].

4.3. Regression analyses

4.3.1. Associations between predictor variables. Pearson’s bivariate correlations were carried out between the study constructs in order to test for associations within the sample that screened positive for PD (Table 9). Point-Biserial correlations were conducted

to examine associations between gender and continuous variables (Linacre, 2008). Self-disgust and shame were correlated moderately ($r=.759, p<.001$). Collinearity statistics were conducted which did not confirm an issue with multicollinearity (VIF = .689, Tolerance = 1.451). A variance inflation factor (VIF) greater than 10 would be cause for concern (Myers, 1990). The tolerance of a value less than 0.1 would also indicate multicollinearity (Menard, 1995). The variance proportion of each variable and their condition index were also examined (Field, 2009), which further disconfirmed multicollinearity. Therefore, both variables were added as predictors to the regression models.

Table 9

Correlation Matrix of study constructs and BCa confidence intervals

Predictor Variable	SDS-R PD (BCa 95% CI)	ESS (BCa 95% CI)	CAS (BCa 95% CI)	CATS (BCa 95% CI)	Gender (BCa 95% CI)
SDS-R PD (self-disgust)	1.0				
ESS (shame)	.759** (.702, .811)	1.0			
CAS (anger)	.544** (.417, .648)	.380** (.233, .542)	1.0		
CATS (sexual abuse)	.273** (.123, .399)	.112 (-.075, .27)	.474** (.32, .592)	1.0	
Gender	.156* (.039, .276)	.190* (.037, .346)	.076 (-.072, .206)	.165* (.083, .241)	1.0

Note. * $p<.05$; ** $p<.01$ level; N=178; CI=confidence interval; BCa=Bias-corrected and accelerated

4.3.2. Logistic regression. A logistic regression was calculated to predict life-time NSSI status in individuals who screened positive for PD (N=188). Self-disgust, shame and anger were entered as predictors. The assumptions of collinearity and linearity of independent variables with log odds were tested and found to be met. Initially, it was thought that gender and sexual abuse may need to be added as co-variates. Both variables

have previously been associated with NSSI (Ille et al., 2014; Smith et al., 2015). However, in the current sample the point-biserial correlation pointed to a non-significant relationship between sexual abuse and NSSI status; $r_{pb}=.129$, $p=.079$, BCa 95% CI [-.021, .263]. A chi-squared test examining the relationship between gender and NSSI status also yielded a non-significant result; $\chi^2(1)=.002$, $p=.966$. Consequently, these two variables were considered not to add to the predictive power of the model and were not entered as co-variates.

A test of the full model against a constant only model was statistically significant, indicating that the predictors, as a set, reliably distinguished between individuals with (N=144) and without history of NSSI (N=44), $\chi^2(3)=29.37$, $p<.001$. Nagelkerke's R of .218 indicated a weak relationship between prediction and grouping. Prediction success overall was 77.1% (94.4% for participants with NSSI and 20.5% for individuals without NSSI). The Wald statistic of 4.4 demonstrated that only self-disgust made a significant contribution to the prediction ($p=.036$, $\beta=.039$). Shame and anger were non-significant. The Exp(B) value indicated that when the level of self-disgust was raised by one unit (one person) the odds ratio was 1.04 times as large and therefore, individuals who experienced self-disgust were 10.4% times more likely to engage in NSSI.

A post-hoc hierarchical logistic regression analysis was conducted examining lifetime NSSI status in the whole sample (N=321). Sexual abuse was included in the model as a co-variate in block one because it was significantly associated with lifetime NSSI status $r_{pb}=.21$, $p<.001$, BCa 95% CI [.108, .3]. Self-disgust, shame and anger were entered in block two. The set of variables reliably distinguished between individuals with (N=214) and without lifetime NSSI (N=107), $\chi^2(3)=64.07$, $p<.001$. Nagelkerke's R was .308 and the prediction success overall was 73.2% (84.6% for participants with NSSI and 50.5% for individuals without NSSI). As sexual abuse ($\beta=.105$, Wald=4.3, $p=.038$, Exp(B)=1.11), shame (Wald=4.9, $p=.027$, $\beta=.023$, Exp(B)=1.02) and self-disgust ($\beta=.033$, Wald=8.2,

$p=.004$, $\text{Exp}(B)=1.03$) increased, participants were more likely to report NSSI. Anger did not significantly contribute to the model.

4.3.3. Multiple regression analyses.

4.3.3.1. Association between outcome variables. The 10 NSSI functions were found to correlate weakly to moderately with a maximum value of $r=.531$ ($p<.001$). This indicated that these self-injury factors likely measured distinct constructs. Regression analyses were carried out controlling for either gender or sexual abuse, depending on whether a significant relationship was found between these co-variables and the outcome variables (table 10).

4.3.3.2. Assumptions. The assumptions of linearity and homoscedasticity were tested by examining the scatterplots which did not point to heteroscedasticity. The normal distribution of the data was tested by inspecting the histograms of standardised residuals and the normal P-P plots of standardised residuals. Errors were mostly normally distributed, yet in some cases they slightly deviated from a normal distribution. Bootstrapping with 1000 samples was applied to all tests to improve the robustness of the sample distribution.

4.3.3.3. Approach. Hierarchical multiple regression analyses were conducted to test the predictive quality of the independent variables on the ten NSSI functions. Co-variables (gender, sexual abuse) were added to the model first, followed by the predictor variables of interest in order to test for effects beyond the effect of the confounders. Self-disgust, anger and shame were added to the model in one block rather than successively due to a lack of research suggesting a better predictive quality of one variable over another (Field, 2009). In cases where gender and sexual abuse were not significantly associated with the outcome, a simple multiple regression was calculated.

4.3.3.4. Results. A regression model including self-disgust, shame and anger

significantly predicted 'self-punishment' with self-disgust as the only significant independent predictor $F(3,141)=14.24$, $p<.001$, $R^2=.244$ (Appendix Q, table a). Self-disgust was also the only significant independent predictor of 'anti-suicide' (Appendix Q, table b). This model included self-disgust, shame, anger as well as gender as co-variables $F(4,133)=6.8$, $p<.001$, $R^2=.177$. Both shame and self-disgust predicted the NSSI function 'communicating distress' $F(3,141)=4.4$, $p=.005$, $R^2=.088$ (Appendix Q, table c).

Whilst controlling for gender, shame was found to be the only significant predictor of 'affect regulation' $F(4,133)=6.4$, $p<.001$, $R^2=.168$ (Appendix Q, table d). Shame also significantly predicted the NSSI function 'self-care' whilst holding sexual abuse constant $F(4,140)=3.54$, $p=.009$, $R^2=.096$ (Appendix Q, table e).

In a regression model including self-disgust, anger and shame, anger was the only significant predictor of 'passive aggression' $F(3,141)=3.28$, $p=.023$, $R^2=.068$ (Appendix Q, table f).

Sexual abuse was found to independently predict the NSSI function 'showing strength' $F(4,140)=3.52$, $p=.009$, $R^2=.095$ (Appendix Q, table g).

No significant regression models were found predicting the NSSI functions 'pulling others close', 'pushing others away' and 'anti-dissociation'. Please refer to Appendix Q for a more detailed presentation of the significant results.

Table 10

Associations between predictors and outcome variables (NSSI functions)

Predictor Variable	Affect regulation (BCa 95% CI)	Self-punishment (BCa 95% CI)	Anti-suicide (BCa 95% CI)	Anti-dissociation (BCa 95% CI)	Self-care (BCa 95% CI)	Comm. Distress (BCa 95% CI)	Pushing away (BCa 95% CI)	Pulling close (BCa 95% CI)	Passive aggress. (BCa 95% CI)	Showing strength (BCa 95% CI)
Self-disgust	.145 (-.05, .323)	.449** (.3, .589)	.358** (.178, .532)	.241** (.051, .424)	.254** (.078, .39)	.071 (-.122, .255)	.065 (-.15, .267)	-.108 (-.286, .052)	.078 (-.120, .243)	.121 (-.101, .318)
Shame	.284** (.098, .443)	.428** (.280, .579)	.293** (.128, .461)	.297** (.128, .461)	.332** (.178, .472)	.212* (.000, .104)	.025 (-.156, .19)	-.052 (-.236, .116)	.135 (-.083, .3)	.084 (-.134, .28)
Anger	.050 (-.11, .206)	.244** (.068, .390)	.320** (.138, .5)	.260** (.071, .433)	.195* (-.017, .39)	.129 (-.04, .283)	.24** (-.023, .46)	.044 (-.149, .233)	.236* (.024, .413)	.207* (.019, .391)
Sexual abuse	-.064 (-.277, .15)	.152 (.0, .272)	.06 (-.139, .3)	.160 (-.025, .4)	.187* (-.02, .451)	-.095 (-.248, .08)	.237** (.021, .48)	.024 (-.108, .144)	.063 (-.09, .236)	.258** (.069, .448)
Gender	.344** (.158, .517)	.081 (-.107, .28)	-.187* (-.03, .359)	.168 (-.018, .34)	.132 (-.07, .308)	.102 (-.113, .3)	-.016 (-.24, .197)	-.245** (-.486, .04)	-.153 (-.417, .140)	-.008 (-.247, .21)

Note. BCa=bias-corrected and accelerated; CI = Confidence Interval; *p<.05; **p<.01

5. Discussion

This cross-sectional study examined the role of self-disgust in NSSI among individuals with personality disorder features. Self-disgust was explored in conjunction with shame and anger in order to identify the unique contribution of these, possibly coupled, affect-states to NSSI. This research also examined the psychometric structure of the self-disgust scale revised/SDS-R (Powell et al., 2015) in the sample of individuals who screened positive for PD.

The results showed higher levels of self-disgust, shame and anger in individuals who screened positive for PD as compared to the control subjects. This is in line with hypothesis one, which predicted higher levels of negative affect amongst individuals who screened positive for PD. Self-disgust, anger and shame displayed positive associations, which confirms the hypothesis that an increase in one affect-state is linked to an increase in another affect-state. Within the sample that endorsed PD symptoms, self-disgust was an independent predictor of lifetime NSSI status, which only partially supports hypothesis three. Shame and anger were hypothesised to add to the predictive power of the model but were found to be non-significant. Self-disgust was also an independent predictor of the 'self-punishment', 'anti-suicide' and 'communicating distress' functions of NSSI.

5.1. Self-disgust among individuals with PD features

The results showing elevated levels of self-disgust among individuals with PD symptoms fit with previous research (Rüsch et al., 2011; Schienle et al., 2013). In the control sample self-disgust was positively skewed, indicating individuals scored at the lower end of the spectrum of self-disgust. The majority of the current sample that screened positive for PD engaged in NSSI (77%), which may add to recent evidence of the association between self-disgust and NSSI. Elevated self-disgust has been reported in individuals who injure themselves as compared to those who do not engage in self-injury (Smith et al.,

2015). This was also found in the current sample. Individuals with PD symptoms who endorsed lifetime NSSI reported significantly higher levels of self-disgust than those who did not engage in NSSI.

5.2. The relationship between self-disgust, anger and shame

Up to now no research has explored the relationship between self-disgust and shame. In the current study self-disgust showed a moderately strong positive relationship with shame ($r=.759$) which confirmed previous theoretical propositions that these two affect-states may overlap (Powell et al., 2014). Nevertheless, items on visceral sensations are unique to the measurement of self-disgust. The subscale 'bodily shame' of the ESS (Andrews et al., 2002) does not assess physical reactions to shame. Furthermore, the model of shame proposed by Andrews and colleagues assumes that not all individuals who are prone to feelings of shame will experience bodily shame (Andrews et al., 2002). This differs from the idea of self-disgust as an enduring sense of self with a strong visceral component that co-occurs with behavioural self-disgust (i.e. an emotion schema; Powell, Simpson & Overton, 2015). Alternatively, it was proposed that disgust might underlie shame and all other self-conscious emotions and that shame may be a form of disgust (Power & Dalgleish, 2015). This hypothesis has been questioned by Powell and colleagues, not least because the innate non-verbal expressions of shame and disgust are distinct. In the current study, shame and self-disgust differed in their predictive quality which may indicate that they represent two distinct constructs (cf. Powell, Simpson & Overton, 2015). More research has yet to be conducted to further existing theories of self-disgust and to explore its relationship with shame.

Anger correlated more strongly with self-disgust ($r=.54$) than shame ($r=.38$). The fairly weak association between anger and shame is an interesting result considering the amount of previous studies suggesting that anger and feelings of shame are highly

correlated (e.g. Klonsky, 2009). It was noticeable that within the sample of individuals who screened positive for PD, the average score on the CAS (Snell et al., 2013) was 15.3 (range=0-52). Moderate to severe clinical anger is reflected by scores between 20 and 63 (Snell et al., 1995). It appears unlikely that this low score represents an externally valid result since anger has consistently been reported amongst individuals who self-harm (e.g. Brown et al., 2002). It might be the case that participants underreported levels of anger for social desirability reasons. Research points to an inverse relationship between anger and social desirability, which indicates that lower scores on anger are associated with higher scores on social desirability (Spoonts, 2008; Bartz, Blume & Rose, 1996). An alternative reason may be related to the scale itself. The CAS assesses the syndrome of clinical anger (Snell et al., 2013). Perhaps participants had difficulties accessing feelings of anger outside a situational context. The SDS-R (Powell et al., 2015) may capture trait rather than state self-disgust, which may have been more accessible. Nevertheless, this result may also raise the possibility that anger is not as pronounced in individuals who screen positive for PD as previously found.

5.3. Self-disgust and lifetime NSSI

The current research provided first indications that elevated self-disgust increases the likelihood of lifetime NSSI amongst individuals who screen positive for PD. Self-injury has been suggested as a way to purge internal feelings of self-disgust which may be experienced as a threat to the psychic integrity (Benson, Boden & Vitali, 2015). The post-hoc analysis of the whole sample highlighted that higher levels of shame and self-disgust as well as childhood sexual abuse were associated with increased odds of endorsing lifetime NSSI. Only one study has previously been conducted examining a similar research question: in a college sample both sexual abuse and self-disgust were significantly associated with the likelihood of endorsing lifetime NSSI (Smith et al., 2015), though shame and anger were not

examined.

Interestingly, an increase in anger did not increase the odds of NSSI. Again, this result contrasts with plethora of previous research pointing to anger as robust risk factor of NSSI (e.g. Nock et al., 2009). However, this is the first study to examine anger alongside both shame and self-disgust. The independent effect of anger on NSSI found in previous studies might have occurred because its shared variance with shame and self-disgust was not accounted for (cf. Fox & Harrison, 2012; Tangney, Wagner, Fletcher & Gramzow, 1992).

5.4. Self-disgust and functions of NSSI

Results from multivariate regression analyses pointed to self-disgust as a single independent predictor of the self-punishment function of self-injury. Engaging in NSSI for self-punishment reasons may represent a link between self-disgust and self-hatred, both of which prompt self-persecution and self-attack (Powell et al., 2014). In a study that measured self-disgust before and after NSSI (Kleindienst et al., 2008), self-disgust occurred prior to NSSI and did not decrease following NSSI. Perhaps this may be why in the current research self-disgust did not predict the affect-regulation function of NSSI. Self-injury may not lead to a relief of the adverse emotional experience of self-disgust but rather sustain or even increase feelings of self-disgust (Benson et al., 2015).

The findings of the multiple regression analyses also highlighted self-disgust as the best independent predictor of NSSI as a way of avoiding committing suicide. The anti-suicide function involves replacing the impulse to commit suicide with NSSI (Klonsky, 2007). Self-disgust has been found to be strongly associated with depression (Smith et al., 2015), which in turn is known to increase the risk of suicidal ideation and suicide (Beck, Kovacs & Weissman, 1979). From a clinical perspective, self-disgust as an all-encompassing sense of self that one cannot escape or pull away from could possibly contribute to depressed mood and suicidal ideation (cf. Smith et al., 2015).

Both self-disgust and shame predicted the 'communicating distress' function of NSSI. Considering attachment theory, which is highly relevant to understanding PD symptoms (Bowlby, 1973), it does not seem surprising that individuals with a possible history of insecure attachment might engage in NSSI to communicate their distress. In fact, research has found a link between NSSI in BPD and an anxious-avoidant attachment style as assessed by the adult attachment interview (Levy, Johnson, Clouthier, Scala & Temes, 2015). Choosing more functional strategies of interpersonal communication may be difficult, particularly in cases where individuals expect others to be rejecting. Both shame and self-disgust have been associated with this expectation (Gilbert & Procter, 2005; Powell et al., 2015).

The fact that anti-dissociation was not predicted by any of the study constructs is worth mentioning. The evidence of NSSI as a strategy to reduce feelings of numbness has been controversial with some studies endorsing and others negating this (Klonsky, 2007). Based on research into dissociation as well as qualitative research into self-disgust, it seems possible that NSSI in the context of self-disgust is a strategy to induce dissociation rather than counteract it. Evolutionarily, one pulls away or separates from what is disgusting to avoid contamination (Tybur, Lieberman, Kurzban & DeScioli, 2013). In line with this idea, individuals with high levels of self-disgust have indicated trying to split off their disgusting self (Powell et al., 2014). Furthermore, dissociation involves a vasovagal response, including a drop in heart rate and blood pressure. Dissociation can occur when faced with blood or when being contaminated (Schauer & Elbert, 2010). Therefore, penetration and cutting of one's own skin in the context of NSSI is posited to induce a state of dissociation in order to reduce the heart rate and negative emotions. Dissociation may be of particular relevance when individuals experience high levels of self-disgust.

5.5. Psychometric properties of the SDS-R PD

Research into self-disgust is at its early stages (Powell et al., 2015) and a strong theory of self-disgust has not yet been established. The results of the PCA with the current sample of individuals who screened positive for PD did not appear to convincingly suggest that all items in the SDS-R (Powell et al., 2015) were construct specific. Three items were deleted due to non-salient loadings and because they did not appear as relevant conceptually (i.e. measuring dislike rather than self-disgust). As opposed to the SDS (Overton et al., 2008), the SDS-R measures visceral aspects of self-disgust, however perhaps not enough so. Adding further self-disgust specific items related to behaviours, cognition and bodily experiences may be of particular importance to improve the internal validity of the scale and to prevent tapping other overlapping constructs such as shame and self-hatred. This could be an interesting endeavour for future research.

As highlighted by the principal component analysis, physical self-disgust explained over half of the variance (57.5%) amongst individuals who screened positive for PD, compared to 33% in the college sample that was recruited for preliminary psychometric analyses of the SDS-R (Powell et al., 2015). This fits with the qualitative reports of individuals with a diagnosis of PD who took part in the consultation group prior to the development of this study. All participants described overwhelming feelings of revulsion at themselves which caused strong feelings of nausea.

5.6. Study limitations

The current study has several limitations which may negatively impact the generalisability of the results. The presence or absence of personality disorder was assessed through a self-report screening tool (Fok et al., 2015). The SAPAS is a standardised tool and with a cut-off score of ≥ 3 has been found to correctly identify a PD in 70-90% of cases (Fok et al., 2015; Pluck, Sirdifield, Brooker & Moran, 2011), however diagnostic

screening tools bear the risk of false categorisations. Comparisons of screening tools and structured clinical interviews have highlighted false positive results through self-report screens (Ekselius, Lindström, von Knorring, Bodlung & Kullgren, 2007). A clinical cut-off score of ≥ 4 was used in this study to gain greater specificity. Nevertheless, it cannot be assumed that the sample consisted of individuals with a diagnosable personality disorder.

Consideration also needs to be given to the heterogeneity of the sample. Participants in the healthy control sample may have had mental health problems such as affective disorders, eating disorders or substance use problems. The 12-month prevalence of psychiatric disorders in the general population has been found to be high (31%) (Jacobi, Wittchen, Hölting, Höfler, Pfister, Müller et al. 2004). Furthermore, participants who screened positive for PD may have had other mental health problems (Maj, 2005). The time-consuming survey did not permit assessing possible confounding variables such as depression, post-traumatic stress disorder and eating disorders, all of which have been found to be associated with self-disgust (Fox & Harrison, 2008; Rüsç et al., 2011; Smith et al., 2015).

It is likely that self-selection biases occurred (Heckman, 1990). Even though potential participants were advised that their views were relevant whether or not they identified with the experience of self-disgust, participants with higher levels of self-disgust may have felt more motivated and willing to spend time answering the questions. A high drop-out rate of over one third was noted. A comparison of mean levels of self-disgust between participants who completed and dropped out of the survey showed significantly higher self-reported self-disgust in survey completers. The sample in this study may be non-representative.

Difficulties identifying and labelling affect-states have been found in individuals with mental health problems (Allen & Fonagy, 2006). This raises the question of the internal validity of the findings. Some emotions may be easier accessible than others (Robinson &

Clore, 2002), some may be experienced with higher volatility (Elgin, 2007), and most affect-states carry idiosyncratic meanings and beliefs that influence the response (Robinson & Clore, 2002). For instance, identity-specific beliefs about emotions (e.g. 'I am a disgusting person') are more likely activated where situation non-specific questions are asked, as was the case in the current study. Reports of trait affect have been reported less variable and more reliable than reports of state affect (Robinson, 2000). The situation-unspecific nature of the questions in this survey may have improved the validity of the self-report.

Recall biases may have occurred in the inventory assessing functions of self-injury. Participants may have found themselves trying to remember situations in which they engaged in NSSI in order to identify the function(s) of their self-injurious behaviour. Accurate recall has been proposed to depend on participant characteristics (age, socioeconomic background, motivation), the degree of detail required, the time interval, the meaningfulness of the event to be recalled and social desirability (Coughlin, 1990). These factors may or may not have adversely affected the accuracy of the results.

Another limitation of this study includes the dichotomous categorisation of lifetime NSSI self-injury (yes/no). The available data did not allow differentiating between individuals who no longer engaged in NSSI and those who were current self-harmers, a distinction that might have been important (cf. Smith et al., 2015).

5.7. Directions for future research

The current study was the first to investigate both self-disgust and its related construct of shame in individuals with PD symptoms. Much of the phenomenology of shame and self-disgust remains unanswered. Can self-disgust be experienced in the absence of shame? Is self-disgust an antecedent of shame proneness? How do self-disgust and shame differ in terms of behavioural and psychopathological manifestations? There is scope for both qualitative (cf. Powell et al., 2013) and longitudinal quantitative research to

investigate these questions.

The low levels of self-reported anger amongst individuals who screened positive for PD are inconsistent with previous findings (Gardner, Leibenluft, O’Leary & Cowdry, 1991). Future research into the relationship between anger and self-disgust could be conducted, perhaps using a different psychometric tool to assess anger. For instance, the State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999) captures state and trait anger as well as four additional sub-scales. It may provide a more comprehensive assessment of a variety of aspects of anger than the CAS (Snell et al., 2013) can offer (cf. Feindler, 2006).

An interesting extension of the current research may also be an investigation into self-hatred. Qualitative research has suggested self-disgust and self-hatred may be particularly difficult to distinguish (Powell et al., 2014).

Very little research has so far been carried out to determine whether self-disgust is a precursor and/or a consequence of NSSI. Ecological momentary assessment (Trull & Ebner-Priemer, 2013), a longitudinal self-report method using mobile phones and other electronic devices, would enable real time ratings of self-disgust (and overlapping affect-states) before and after NSSI. This research method may enable insight into self-disgust as state-affect and may highlight the role of self-disgust in the maintenance of self-injurious behaviour.

5.8. Clinical implications

Self-injurious behaviour is often of chronic nature and clinicians are faced with the challenge of managing the related risk as well as identifying effective interventions. Treatments have so far not targeted self-disgust and yet the current results add to the growing evidence-base suggesting self-disgust as a risk factor for NSSI. Therefore, clinical assessments of self-injurious behaviour could incorporate questions about self-disgust as possible precursor and/or consequence of NSSI.

Self-disgust appears to be associated with the urge to self-punish by engaging in self-injury. This result may provide preliminary indications how self-injurious behaviour may be maintained in individuals with pathological levels of self-disgust. Interventions improving self-compassion (Gilbert & Procter, 2005) and emotional acceptance (Gratz, 2007) may reduce the impulse to attack the self.

External disgust has been reported to be more resistant to habituation than fear (Adams, Willems & Bridges, 2011). It has also been suggested that exposure to disgust-relevant cues in the environment is more effective when reappraising the emotional reaction of disgust rather than suppressing it (Olatunji, Berg & Zhao, 2015). In individuals with self-disgust related dysfunctional cognitions tend to co-occur (Overton et al., 2008). The effectiveness of exposure to self-disgust has so far not been investigated, however, a combination of exposure and cognitive work (e.g. reappraisal) may help (cf. Powell et al., 2015).

The preliminary results of this study suggested a pronounced physical self-disgust component in individuals who screened positive for PD (e.g. “Kind of like when you feel sick in your stomach but instead of that it’s sort of spread up through your spinal cord”; Powell et al., 2014). Perhaps therapeutic interventions could incorporate working with ‘the bodily felt sense’ of self-disgust (Hendricks, 2007) which would enable to access the more implicit, pre-symbolic experiences of self-disgust (Gendlin, 1996; Rüsçh et al., 2011).

Self-conscious emotions, including shame and self-disgust, have been suggested to develop from the age of three (Tracy, Robins & Tangney, 2007). Maltreatment and parental criticism increase the likelihood of pathological manifestations of shame and self-disgust (Powell et al., 2015). Therefore, it may be particularly important to consider the developmental history of clients who experience self-disgust. The maladaptive and all-encompassing sense of being disgusting (Powell et al., 2014) is reminiscent of the concept of the ‘alien self’ (Fonagy, 2000). Self-disgust may mirror an alien representation of the self,

internalised through the caregiver's mis-attuned attitude/behaviour towards the child (Rossouw, 2012). The alien self impedes the child's capacity to make sense of its inner world as well as the relational world (i.e. inability to mentalise). Within the framework of Mentalisation-Based Treatment (MBT) (Bateman & Fonagy, 2009), self-injury is seen as an attempt to liberate the self from the alien self (Rossouw, 2012; cf. Benson et al., 2015). An improvement in the ability to mentalise has been associated with a reduction in the influence of the alien self (Rossouw, 2012). In cases where clients with pathological self-disgust and related NSSI report childhood maltreatment or overly critical/blaming caregivers, MBT may offer an effective treatment approach.

5.9. Conclusions

The current study points to a particularly pronounced visceral component of self-disgust among individuals who screen positive for PD. It also highlights self-disgust as a risk factor for NSSI and gives first indications that self-disgust may be associated with the urge to self-punish. Further research into the phenomenology of self-disgust is needed in order to better understand its association with other affect-states, to improve its measurement, and to aid the development of effective interventions.

6. References

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Part Three. Critical Appraisal

1. Introduction

The aim of this critical appraisal is to aid future research by commenting on advantages and disadvantages of online survey research and by going further into the strengths and weaknesses of the self-report questionnaires used in this study. The critical appraisal also explores the benefits and ethical implications of service user involvement, an approach used to inform the development of this research project. This section includes reflections on the impact the research had on me as a researcher as well as implications for the research at hand. Lastly, a discussion of (self-)disgust within the societal context is provided by drawing on relevant literature as well as reflecting on related clinical material.

2. Online survey research

Psychometric measures aim to quantify abstract phenomena and theoretical constructs (Kimberlin & Winterstein, 2008). Social sciences heavily rely on this method which is known to be cheap and time-efficient. The use of self-report questionnaires in online survey research in particular has the benefit of reaching hundreds of individuals (Wright, 2005). What is more, online studies enable easy access to populations that may otherwise be difficult to recruit and who may feel uncomfortable meeting face-to-face (Wright, 2005).

Whilst it is not possible to track which of our recruitment strategies yielded the best results (e.g. flyers in PD services or Facebook groups), I believe the current research benefitted considerably from posting in online peer support groups for individuals with personality disorder. Especially at the beginning of the recruitment phase we monitored participant numbers, which seemed to increase rapidly on the days following our posts in these groups.

As with any research method, online surveys have disadvantages. These include sampling biases (e.g. little is known about the demographic characteristics of participants),

reporting biases (e.g. participants not providing accurate information) and self-selection biases (as discussed in the empirical paper), all of which limit the generalisability of the findings (Wright, 2005). The high drop-out rate noted in the current study corroborates issues with the generalisability. The higher the drop-out rate the less representative the sample, especially where drop-out occurs non-randomly (Hoerger, 2010). Research has suggested that in online surveys it is common for about 10% of participants to drop out (Hoerger, 2010). Drop-out beyond this figure tends to be associated with the survey length. This survey took participants about 35 minutes, a time span that is likely to require motivation and an ability to manage difficult feelings. The current drop-out rate perhaps needs to be understood both under methodological and wider ethical considerations. For instance, participants who dropped out due to psychological distress caused by the survey were not able to donate £1 (Skitka & Sargis, 2006). Even though participants were informed of the above and advised of the potential distress, ethical concerns remain.

Another ethical concern related to participant drop-out arose after analysing the SDS-R with the sample of individuals who screened positive for PD. The principal component analysis was conducted using data of both participants who completed the survey and those who dropped out. Participants who dropped out might have been unclear as to whether their data would still be used (British Psychological Society, 2013). This was not explicitly stated on the information sheet. Perhaps those who dropped out did so in order to communicate wanting to withdraw their data. However, the self-disgust scale was the first questionnaire in the survey which participants completed shortly after giving consent. This decreases the likelihood that participants felt uncomfortable providing data for our research. It could also be argued that it would be unethical to discard data of individuals who gave their valuable time to complete the SDS-R. Furthermore, participants were aware they were submitting their data into an electronic system and therefore, might have assumed their data would be used unless stated otherwise. We did not receive any

qualitative feedback of participants expressing the wish to withdraw their data which further corroborates the above. Nevertheless, in the future it would be important to eliminate any ambiguities by stating explicitly on the information sheet how the participant data will be used.

Ethical implications of intruding on peer support groups may be worth mentioning as well. Some members might have considered the posts offensive and disrespectful (Hudson & Bruckman, 2004). However, we did not receive any complaints, quite the opposite, members of PD peer support groups promoted our study by commenting that it was useful research. This may mirror a particular relevance of the current research to participants with PD. Perhaps the website we created also increased the perceived credibility of our research. It included information about the study, relevant literature, details about the three charities and brief information about ourselves as the researchers. Research websites may indeed be a valuable strategy to aid participant recruitment.

2.1. Self-report questionnaires

As already mentioned in previous parts of this thesis, self-report questionnaires involve both advantages and disadvantages such as recall biases, biases related to the possible inaccuracy of self-reported affect-states, and issues with the psychometric quality. I would like to elaborate on the quality of the self-report measures used in the current study because it determines the validity of the conclusions and inferences that can be drawn. By operationalising a theoretical construct, we hoped to create an assessment tool with as little measurement error as possible (Kimberlin & Winterstein, 2008). The degree of the measurement error is determined by reliability and validity estimates. Reliability refers to a measure's accuracy and stability which is often reported as internal consistency and inter-rater reliability (Radhakrishna, 2007). Validity is concerned with the question whether a measure actually measures what it intended to measure (Radhakrishna, 2007). Of specific

interest here are the two major study constructs of the current research: self-disgust as measured by the SDS-R (Powell, Simpson & Overton, 2015) and non-suicidal self-injury assessed with the ISAS (Klonsky & Glenn, 2009).

The SDS-R was the only existing questionnaire that appeared to capture some core aspects of self-disgust which individuals concerned have reported (e.g. visceral reactions). Nevertheless, at the time of the current research a full psychometric evaluation of the SDS-R was pending (i.e. discriminant and convergent validity, confirmatory factor analysis in non-clinical population, exploration of factor structure in clinical populations). This raises the question whether the SDS-R is internally valid. To date no robust theory of self-disgust exists, plus evidence confirming theoretical propositions is still lacking. Did the SDS-R measure self-disgust or did the scale fail to discriminate between self-disgust and similar/overlapping constructs (i.e. shame, self-hatred)? Whilst we were able to determine the reliability of the SDS-R (i.e. internal consistency), investigations into the validity of the SDS-R in both clinical and non-clinical populations have yet to be conducted. It should also be noted that the SDS-R has never been used amongst individuals who screened positive for PD and therefore, prior to the study the phenomenology of self-disgust in this population was unknown. Conducting a principal component analysis (PCA) to explore the structure of the scale based on the sample that screened positive for PD was probably one of the methodological strengths of this research. However, given the explorative nature of the PCA and the lack of confirmatory evidence of the SDS-R there is a need to replicate the current findings. Researchers could also use methodological triangulation (Denzin, 2006) to further the construct of self-disgust, i.e. by conducting qualitative interviews with survey participants.

As opposed to the SDS-R, the ISAS (Klonsky & Glenn, 2009) is an assessment tool that has frequently been used in studies investigating functions of self-injurious behaviour. Since a number of studies into its psychometric quality existed (e.g. Klonsky, Glenn, Styer,

Olino & Wahsburn, 2015), I did not initially have concerns regarding the internal validity of the scale. However, the stage of the data analysis involved careful consideration of the clinical relevance and meaningfulness of the ISAS. Unexpectedly, its ecological validity appeared questionable (see Appendix O for details). The next step involved exploring the face validity of the items and the overarching factors. This was an interesting process as it required me to reflect on how well the items/factors captured the clinical phenomenology of non-suicidal self-injury. This is a procedure that may not always be an integral part of survey research as it is time-consuming. The additional benefit of engaging in this process surfaced when it came to making sense of the results of the statistical analyses, including the multiple regression analyses and the exploratory factor analysis (EFA). I believe the extensive reflections improved my ability to generate clinically meaningful interpretations. The EFA, which is a dimension reduction method (Field, 2009), resulted in 10 instead of 13 factors, a result that pointed to a successful data reduction. An EFA aims for a simple structure which means items should only load on one factor (Field, 2009). The extraction of 10 factors was considered to be an appropriate result as only two items showed double-loadings. The 10-factor solution also produced the most clinically intuitive categories which suggested factorial validity (Field, 2004).

Nevertheless, there are a number of weaknesses related to the EFA as well as the ISAS. The EFA was carried out with a sample of 144 participants. There is a lack of consensus regarding the sample size needed to ensure statistical power when performing an EFA (Anthoine, Moret, Regnault, Sbille & Hardouin, 2014). Recommendations range from a subject to item ratio of two to 100. With 39 items the subject to item ratio of the current study was 4:1, which is situated at the lower end. It could be valuable to replicate the findings in a bigger sample of individuals who screen positive for PD. Furthermore, the EFA resulted in factors that comprised three to five items. It has to be noted that three items have been suggested to be the minimum in order to gain a stable and solid factor

(Costello & Osborne, 2005). In fact, five factors (affect-regulation, self-punishment, self-care, anti-dissociation, anti-suicide) only comprised three items. What does this mean for the quality of the ISAS? Adding even more items to the lengthy ISAS would perhaps be excessive. An option may be to add further items but to create two separate questionnaires (interpersonal vs. intrapersonal NSSI functions). Replacing or adding items could be important because this may improve the internal validity and stability of the ISAS factors. For instance, there appears to be some ambiguity with regards to how dissociation is defined (Klonsky & Glenn, 2009). Items subsumed under 'anti-dissociation' include 'making sure I am still alive when I don't feel real' and 'causing pain to stop feeling numb'. The latter item may assess emotional numbing, whereas the former item may assess de-personalisation, both of which are suggested to be overlapping and yet dissimilar components of the overarching construct dissociation (cf. Holmes, Brown, Mansell, Fearon, Hunter, Fasquillo, et al., 2005). Considering the clinical applicability of the ISAS, it may indeed be relevant to re-evaluate what each item is aiming to assess.

In conclusion, evaluating the usefulness of the two questionnaires was valuable in furthering my research skills. To me this process highlighted that in order to utilise psychometric scales to the maximum benefit, considering their psychometric properties and their clinical meaningfulness is equally essential.

3. Service user consultation

Service users involved in research have reported a positive impact on their self-esteem, confidence and sense of well-being (Minogue, Boness, Brown & Girdlestone, 2005). NHS services in turn tend to benefit from the unique perspective of the 'lived experience', which can help to improve the research focus and design. Prior to commencing the current research service users with a diagnosis of PD were invited to a focus group to assist us with a better understanding of self-disgust and to receive advice on how to best

measure self-disgust. The openness with which service users spoke about this deeply personal and undoubtedly painful experience was astonishing and moving and I was left with a strong sense of responsibility to make it worth their while.

Many participants described self-disgust as an all-encompassing sense of self:

“Disgust is more like I can’t do anything to change it now, this is how I feel, this is how I am, this is who I am at the very core of my being and it’s a disgusting thing.”

Others described how inadvertently catching their reflection in a mirror triggered immediate feelings of self-disgust and nausea. The inability to separate from self-disgust consequently led some of the participants to self-harm, which they used to validate their self-disgust or to punish themselves for feeling this way. Many participants linked the origin of their self-disgust to adverse childhood experiences and wondered whether self-disgust had been projected into them through abuse and annihilation.

After the consultation group I felt shaken by the participants’ descriptions of themselves and the severe impact self-disgust appeared to have on them. I was also concerned that some may have been left feeling exposed. There was time to debrief towards the end in order to help participants manage feelings of distress, though this might not have been sufficient. Perhaps my own response to the service users’ self-reports was pronounced sadness and helplessness linked with an urge but inability to take their feeling of self-disgust away. To me this experience highlighted the possible ethical implications of service user involvement, namely, the emotional impact of speaking openly about lived experiences outside of a therapeutic context. Nevertheless, sharing experiences in a group of individuals with similar difficulties may have been normalising (Culham & Nind, 2003). It also may have enabled a sense of empowerment and reinforced notions of ‘expertise by experience’ (Telford & Faulkner, 2009). It would have been good practice to ask for anonymous feedback on the consultation process and its impact.

Having spoken to individuals with high levels of self-disgust increased my

awareness of the probable emotional impact of the self-disgust scale (and other questionnaires) on survey participants. Self-disgust appeared to be an all-encompassing emotion reflecting the core of the self, which participants were confronted with by taking part in the study. A few participants contacted us by e-mail to draw attention to the emotional distress they experienced as a consequence of taking part. Apart from providing distress management strategies, emergency numbers and the researchers' contact details, the nature of the online study prevented more in-depth support of participants. This is certainly one of the most significant drawbacks of anonymous online studies.

The necessity to discard the scale (Appendix D) that was developed based on the service user consultation highlighted further ethical implications. I was not only left feeling disappointed but also felt as though I was not doing justice to the service users who had given their time and who had been willing to accept emotional distress in order to aid the development of the scale. Nonetheless, I had the opportunity to share the end product of this research with some of the service users who had been involved in its development. Those who had provided their contact details were contacted by e-mail and encouraged to take part in the online survey and to give feedback if they wanted to.

Despite the setback regarding the scale, the opportunity to hear the service users' perspective and to learn from their lived experience was still essential for the subsequent research process. Not only had I gained an improved understanding of self-disgust which informed my thinking and writing, but it also enabled me to embark on the research process with even stronger commitment and motivation to add to the evidence-base. The research felt very relevant to what individuals with personality disorder seemed to experience and hence had become meaningful. This was particularly helpful because the subsequent research process did not involve service user contact and thus bore the risk of detachment from the participants' lived experience, replaced by numbers.

By and large it appears that there is a need for ethical considerations to take place

prior to service user consultations in order to weigh up the gains for researchers and the gains as well as the possible detriments to service users. Consulting service users was certainly an enriching experience. It substantially influenced the extent to which I felt committed to the research, it improved my understanding of self-disgust and it aided the development of the research project.

4. (Self-)disgust in the societal context

Reviewing the role of disgust within the societal context was beyond the scope of this study which focused on intrapersonal disgust (self-disgust). To me the wider literature on disgust raised the possibility of a dynamic interplay between interpersonal and intrapersonal disgust which I would like to reflect on in this section.

As mentioned in the empirical paper, from an evolutionary perspective the feeling of disgust was suggested to emerge in the context of pathogen avoidance, meaning infants reject food that is potentially harmful (Rottman, 2014). However, research has struggled to provide robust evidence for the emergence of disgust expressions in infants aged three to five, the period during which they initially come into contact with food. Sensory disgust reactions tend to emerge in middle childhood (Rottman, 2014). Therefore, researchers hypothesise that disgust not only develops for the purpose of pathogen avoidance but may in fact also be a strategy to regulate social interaction (Powell et al., 2015). The sparse evidence-base suggests that disgust elicitors vary across cultures (Bitton, 2008). For instance, in Western cultures deviant social behaviours such as paedophilia elicit disgust (Rottman, 2014). Socialisation and cultural learning appear to play a crucial role in the development of interpersonal disgust which in cases such as paedophilia is considered functional (Miller, 1997). Moral judgement is likely to be inherent in disgust (e.g. 'That makes me sick'). As with any psychological phenomenon there is scope for interpersonal moral disgust to be expressed on the dysfunctional/unhelpful end of the spectrum.

Research has highlighted an association between interpersonal disgust sensitivity and prejudice towards others as well as dehumanisation of out-groups (Curtis, 2011; Hodson & Costello, 2007). Interpersonal moral disgust seems to involve a notion of degradation as well as a sense of being better and purer than the object of disgust, strengthening the boundary between self and other, reinforcing avoidance behaviour and maintaining social hierarchies (Hodson & Costello, 2007).

How may moral disgust in the social context be related to pathological self-disgust? In order for anyone to feel love, compassion and connectedness, feelings of (self-)disgust need to be suspended (cf. Miller, 1997). For instance, feeling compassion towards out-groups (e.g. immigrants, the homeless) may require low levels of interpersonal disgust. In turn, what would be the consequence for a member of an out-group to experience the self or parts of the self as inherently abhorrent? A complete inability to feel loveable and worthy of social belonging may be invoked (cf. Powell et al., 2015). These ideas raise the question whether there is a possible interface between self-disgust and interpersonal moral disgust and whether, in combination, they contribute to the maintenance of social marginalisation (cf. Curtis, 2011).

Before starting my doctorate in clinical psychology I worked with homeless people with complex trauma. Most clients also had a diagnosis of personality disorder. I remember being struck by how badly a great number of the homeless treated themselves (i.e. self-harmful behaviour) and how the society's prejudices appeared to maintain their social exclusion (e.g. barriers to accessing mainstream services). Perhaps we as a society tend to quickly label someone as 'challenging' and then turn away because we cannot bear the suffering (Cockersell, 2015). Avoiding outsiders might also be a disease avoidance strategy (Curtis, 2011). Sadly, some of my clients engaged in severe self-destructive behaviour (e.g. sleeping in their own faeces), which in turn provoked revulsion in others and reinforced the social isolation. Perhaps this was an unconscious attempt to keep others at bay and/or it

might have reflected their inner sense of self (core self-disgust?). Establishing a relationship with this client group proved very difficult and was only possible through a consistent and tentative long-term approach, if possible at all. Some clients did benefit from an experience of 'the other' (psychologist) as caring and consistently available despite their numerous attempts to push them away, a relational experience that might have been reparative to some extent. Nevertheless, this was at odds with societal attitudes towards the homeless that were largely dismissive and appeared to impede recovery. Art activities with subsequent art exhibitions were implemented which helped to counteract the stigma and social exclusion of the homeless (please refer to Williamson & Taylor, 2015 for more details).

To conclude, in the context of (self-)disgust it may be helpful to ask how someone stands with others as much as how someone stands with oneself (cf. Miller, 1997). There may be a dynamic interplay between self-disgust and interpersonal moral disgust, perhaps particularly pronounced in out-groups and clients with complex needs. Hence, positive changes in pathological self-disgust may be achieved through both providing persistent and caring relational experiences to alleviate the clients' notion of themselves as repulsive as well as via activities promoting social inclusion and acceptance. The latter approach may in turn activate societal compassion, which may help to counteract interpersonal moral disgust and marginalisation (cf. Kelly & Morar, 2014).

5. Conclusions

Research into different forms of disgust is at its early stages but from what is known so far, disgust appears to play a significant role at both the individual and the societal levels. Conducting this research has certainly advanced my understanding of self-disgust and how it may manifest itself in individuals with PD symptoms. Clinically, it has led me to keep in mind possible underlying self-disgust processes in clients who self-harm.

Undertaking this research has also sparked curiosity about other clinical implications of self-disgust that have not yet been investigated (e.g. the extent to which self-disgust causes and maintains psychopathology). Clinicians and researchers would benefit from a valid tool to assess self-disgust which the SDS-R may constitute. I am hoping that research into self-disgust will continue to evolve and, most importantly, that it will give rise to effective interventions for this debilitating mental and emotional state.

6. References

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Appendices

Appendix A

Paper Quality Checklist

(Kmet, Lee & Cook, 2004)

Paper Quality Checklist (Kmet, Lee & Cook, 2004)

CRITERIA		YES (2)	PARTIAL (1)	NO (0)	N/A
1	Question / objective sufficiently described?				
2	Study design evident and appropriate?				
3	Method of subject/comparison group selection <i>or</i> source of information/input variables described and appropriate?				
4	Subject (and comparison group, if applicable) characteristics sufficiently described?				
5	If interventional and random allocation was possible, was it described?				
6	If interventional and blinding of investigators was possible, was it reported?				
7	If interventional and blinding of subjects was possible, was it reported?				
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?				

Appendix B

Outline of joint work

Outline of joint work

The current research was conducted in conjunction with another research project by Clare Drea, who investigated the association between self-disgust and adverse childhood experiences (Drea, 2016). The summary below provides details about the joint work and outlines the separate contribution each trainee made.

Joint work:

- The service user consultation was jointly undertaken.
- The 'Experience of Self-Disgust Scale' (Appendix D), which was ultimately not used in this study, was developed together.
- The NHS ethics application was completed together by merging the two studies into one.
- The research website was jointly created.
- Participants were recruited by both trainees whose efforts were equally divided.
- Prior to the data analysis both trainees worked jointly on cleaning the dataset in SPSS and preparing the data for analysis.
- In terms of the data analysis the trainees exclusively collaborated on conducting the Principal Component Analysis of the SDS-R (Powell et al., 2015) which was considered groundwork for the independent data analyses of the two research projects.

Independent contributions:

- Literature search and reviews were completed separately.
- The data analyses of each empirical study were conducted independently, as evident in the different study aims and differing reports of results.

- The results were independently interpreted, conceptualised and embedded in the literature.
- The thesis write-up was completed independently.
- The critical appraisals were written without any collaboration.

Additional measure used by Clare Drea:

- The Invalidating Childhood Environment Scale (Mountford, Corstorphine, Tomlinson & Waller, 2007). This measure was incorporated in the online survey, together with the measures already mentioned in the empirical paper of the research project at hand.

Appendix C

Ethics Approval Letter

NRES Committee London – Hampstead (REC reference: 15/LO/1032)

03 July 2015

Dr Janet Feigenbaum
Senior Lecturer Clinical Psychology; Consultant Clinical Psychologist
University College London and North East London NHS Foundation Trust
Research Department Clinical, Educational and Health Psychology
University College London
Gower Street
London
WC1E 6BT

Dear Dr Feigenbaum

Study title: Self-disgust and its relationship with early childhood experiences and self-harm.
REC reference: 15/LO/1032
IRAS project ID: 172486

Thank you for your letter of 02 July 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 favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact the REC Manager, Dr Ashley Totenhofer, [REDACTED]. Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

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. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

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 request a deferral for study registration within the required timeframe, they should contact [REDACTED]. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from NRES. Guidance on where to register is provided on the HRA website.

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).

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 [Flyer 1]	1	22 May 2015
Copies of advertisement materials for research participants [Flyer 2]	1.2	22 May 2015
Covering letter on headed paper		01 July 2015
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Arthur J Gallagher]		14 July 2014
Non-validated questionnaire [SDS-R]	1	22 May 2015
Participant consent form [Paper Version]	2	24 April 2015
Participant information sheet (PIS) [PIS paper version]	3	01 July 2015
Participant information sheet (PIS) [PIS on website]	3	01 July 2015
REC Application Form	4.0.0	22 May 2015
Referee's report or other scientific critique report [North East London NHS Foundation Trust]		02 April 2015
Research protocol or project proposal	4	01 July 2015
Response to Request for Further Information		02 July 2015
Summary CV for Chief Investigator (CI) [Janet Feigenbaum]		
Summary CV for student [Clare Drea]		01 April 2015
Summary CV for student [Theresa Schwaiger]		02 April 2015
Validated questionnaire [Validated Questionnaire Pack]		

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/LO/1032	Please quote this number on all correspondence
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With the Committee's best wishes for the success of this project.

Yours sincerely



Signed on behalf of:
Miss Stephanie Ellis
Chair



Enclosures: "After ethical review – guidance for researchers"

Copy to: Mr David Wilson - UCL

Ms Fiona Horton - Research and Development Department, North
East London NHS Foundation Trust

Ms Clare Drea – UCL

Ms Theresa Schwaiger – UCL

Appendix D

Newly developed self-disgust scale:

The Experience of Self-Disgust Scale (ESDS)

The Experience of Self-Disgust Scale (ESDS)

This questionnaire asks about how you feel towards yourself. There are no right or wrong answers. Please indicate how much you identify with the following statements by ticking one of the following options:

Strongly disagree (1)	disagree (2)	somewhat disagree (3)	somewhat agree (4)	agree (5)	strongly agree (6)
1. When I see my body it makes me feel sick	(1)	(2)	(3)	(4)	(5) (6)
2. Fundamentally, I'm happy with who I am	(1)	(2)	(3)	(4)	(5) (6)
3. I put on a mask around others to hide the 'real me'	(1)	(2)	(3)	(4)	(5) (6)
4. When I receive a compliment, I cringe	(1)	(2)	(3)	(4)	(5) (6)
5. I feel alienated in the company of others	(1)	(2)	(3)	(4)	(5) (6)
6. Who I am disgusts me	(1)	(2)	(3)	(4)	(5) (6)
7. When I am around others, I feel completely inadequate	(1)	(2)	(3)	(4)	(5) (6)
8. I'm comfortable in my own skin	(1)	(2)	(3)	(4)	(5) (6)
9. I have repetitive thoughts about how disgusting I am	(1)	(2)	(3)	(4)	(5) (6)
10. The way I act disgusts me	(1)	(2)	(3)	(4)	(5) (6)
11. I enjoy affection from other people	(1)	(2)	(3)	(4)	(5) (6)
12. I have been repulsed by myself for as long as I can remember	(1)	(2)	(3)	(4)	(5) (6)
13. I feel confident being around other people	(1)	(2)	(3)	(4)	(5) (6)

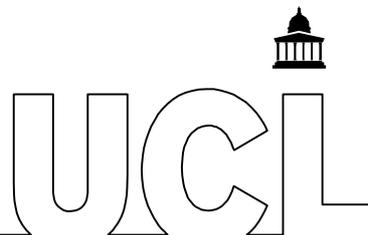
- | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|
| 14. I feel horrified when I catch my reflection in a mirror | (1) | (2) | (3) | (4) | (5) | (6) |
| 15. I avoid looking at myself at all costs | (1) | (2) | (3) | (4) | (5) | (6) |
| 16. I am able to look after my body | (1) | (2) | (3) | (4) | (5) | (6) |
| 17. When people show me affection it makes my skin crawl | (1) | (2) | (3) | (4) | (5) | (6) |
| 18. I am disgusted by my thoughts | (1) | (2) | (3) | (4) | (5) | (6) |
| 19. I repulse others | (1) | (2) | (3) | (4) | (5) | (6) |
| 20. I like my body | (1) | (2) | (3) | (4) | (5) | (6) |
| 21. I find it easy to get close to others | (1) | (2) | (3) | (4) | (5) | (6) |
| 22. I like pampering myself (e.g. hairdresser, shopping) | (1) | (2) | (3) | (4) | (5) | (6) |

Appendix E

Therapist Information Sheet

**IMPART/Eating Disorders
Goodmayes Hospital
Barley Lane
Ilford Essex
IG3 8XJ**

**RESEARCH DEPARTMENT OF CLINICAL,
EDUCATIONAL AND HEALTH PSYCHOLOGY
UNIVERSITY COLLEGE LONDON
GOWER ST
LONDON
WC1E 6BT**



Therapist Information Sheet

Researchers: Clare Drea and Theresa Schwaiger

The origins and consequences of self-disgust in Personality Disorders.

DClinPsy students' research project

You are being asked to invite your patients to take part in a research study. This sheet will give you some more information about why the study is being carried out and what your patient would be asked to do if they decided to take part.

Broad Outline of Research Study

The primary aim of this research is to assess self-disgust in individuals with a Personality Disorder, a Mental Health Disorder and a healthy control group. In addition, the associations between self-disgust and a range of other constructs will be explored (Childhood Trauma, Shame, Anger, Deliberate Self-Harm, Childhood Invalidation).

Only a handful of studies have explored self-disgust in BPD despite the fact that it appears to be particularly elevated in this patient group (Schienle et al, 2013). Self-disgust appears to be a particularly distressing, pervasive and enduring emotion that leads to a host of negative outcomes including increased risk of self-harm (Powell, Overton & Simpson, 2014; Kleindienst, 2008). Self-disgust is also difficult to treat and there are no known treatment recommendations for working with self-disgust. It is therefore necessary to gain greater knowledge of the prevalence of self-disgust to detect whether self-disgust is an important clinical feature across a range of personality disorders.

The information gathered will allow us to learn more about how common the experience of self-disgust is and to also better services and psychological therapies for people who experience high levels of self-disgust.

Methodology

The study will employ a non-experimental, quantitative design and will involve administering a battery of on-line/paper questionnaires to a PD population and two control groups (healthy controls and general mental health population). Participants will be recruited from NELFT and a range of other NHS mental health services as well from the private and charity organisations. The hope is that participants will mainly complete the set of questionnaires online.

Participants will be asked to complete the following questionnaires:

1. The Experience of Shame Scale/ESS (Andrews et al., 2002)
2. The Clinical Anger Scale/CAS (Snell, Gum, Shuck, Mosley & Hite, 2013)
3. The Self-Disgust Scale Revised/SDS-revised (Overton, Markland, Taggart & Bagshaw, 2008)
4. Standardised Assessment of Personality - Abbreviated Scale/SAPAS (Moran, Leese, Lee, Walters, Thornicroft & Mann, 2003)
5. The Inventory of Statements about Self-Injury/ISAS (Klonsky & Glenn, 2009)
6. The Child Abuse and Trauma Scale/CATS (Sanders & Beckerlausen, 1995)
7. The Invalidating Childhood Environment Scale/ICES (Mountford et al, 2007)

Recruitment

We are hoping to recruit participants for the PD sample at IMPART and other PD services in NELFT. After a brief presentation to the clinical teams in PD services we will provide clinicians with flyers that detail the nature of the study and state the link to the online survey where participants can complete the battery of questionnaires. The flyer will also specify that participants can collect the paper version of the questionnaire pack from the receptionist within the service which includes a participant information sheet and consent form. Clinicians in the PD services will be asked to identify potential participants and hand out the flyers to their patients.

Ethical Approval

This study has been approved by Hampstead Research Ethics Committee.

Funding

This study is being funded by UCL Student Research Funds.

Project Team

Dr. Janet Feigenbaum: Strategic and Clinical Lead for Personality Disorder Services, North East London NHS Foundation Trust and Senior Lecturer at the Research Department of Clinical, Educational and Health Psychology, UCL.

Ms Clare Drea: Trainee Clinical Psychologist at the Research Department of Clinical, Educational and Health Psychology, UCL.

Ms Theresa Schwaiger: Trainee Clinical Psychologist at the Research Department of Clinical, Educational and Health Psychology, UCL.

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Appendix F

Participant Consent Form – Paper Version



Study Number: 15/0334

CONSENT FORM

Title of Project: Self-disgust and its relationship with early childhood experiences and self-harm.

Name of Researcher: Dr Janet Feigenbaum

Please initial all
boxes

1. I confirm that I have read and understand the information sheet dated 24/04/2015 (version 2) for the above study. I have had the opportunity to consider the information and have been advised of an individual to contact for answers to questions about the research.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

3. I understand that the data collected during the study will be looked at by individuals from University College London or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to the data.

4. I understand that the information I submit is completely anonymous and that it will not be possible to identify me from any data. It will therefore not be possible to retract my information from the research once submitted.

5. I agree to take part in the above study.

Name of Participant

Date

Signature

Name of Person
taking consent.

Date

Signature

Appendix G

Participant Information Sheet

Information Sheet for Participants in Research Studies

Title of Project: **Self-disgust and its relationship with early childhood experiences and self-harm.**

This study has been approved by the UCL Research Ethics Committee: 15/0328

Name, Address and Contact Details of Investigators:

Ms Clare Drea, Ms Theresa Schwaiger & Dr Janet Feigenbaum
Sub-Department of Clinical Psychology
University College London
Gower Street
London WC1E 6BT

Project Telephone:
Project Email:

Invitation

We would like to invite you to participate in this research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to read the following information carefully. If you would like more information please contact the researchers via e-mail or telephone.

What is this research about?

This research is an online survey that seeks to find out about the experience of self-disgust. Disgust is an emotion that is universal to all humans, yet it is a highly under-researched area. Many people report experiencing disgust about themselves which is known as self-disgust. Our study looks to assess how common feelings of self-disgust are, as we know that some people report higher levels of self-disgust than others. Therefore, we are also interested in experiences that may lead to high levels of self-disgust (i.e. adverse early childhood experiences) and experiences that may result from feelings of self-disgust (i.e. deliberate self-harm).

What will taking part involve?

This survey contains a total of eight questionnaires. Topics covered include personality style, possible experiences of self-disgust and self-harm, feelings about yourself, childhood experiences, and some background information about you. We are interested in your views whether you identify with these topics or not. Taking part will take approximately 25 minutes.

What is this study trying to achieve?

We will use the information to help us learn more about how common this experience is and to also better services and psychological therapies for people who experience high levels of self-

disgust.

What are the possible benefits of taking part?

For each participant who completes the survey, £1* will be donated to one of three charities. Please indicate your choice by circling one of the below charities:

MIND (Mental Health Charity)

EMERGENCE (service user led charity supporting individuals with personality disorders)

NSPCC (National Society for the Prevention of Cruelty to Children)

*Donations will be capped at a maximum of £475

What are the disadvantages and risks of taking part?

These questionnaires cover some topics that may be painful to think about. If you are currently experiencing high levels of distress we would suggest completing this survey at another time.

What if I feel distressed?

If you feel distressed while completing the forms, refer to the extra sheet provided which will give you information to help manage your distress and also recommend where to seek further support. This sheet will also provide the contact details of the researchers who you can contact directly if you feel distressed

What if there is a problem?

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated by members of staff you may have experienced due to your participation in the research, National Health Service or UCL complaints mechanisms are available to you. Please ask your research doctor if you would like more information on this.

In the unlikely event that you are harmed by taking part in this study, compensation may be available.

If you suspect that the harm is the result of the Sponsor's (University College London) or the hospital's negligence then you may be able to claim compensation. After discussing with the researchers, please make the claim in writing to Dr Janet Feigenbaum who is the Chief Investigator for the research and is based at University College London. The Chief Investigator will then pass the claim to the Sponsor's Insurers, via the Sponsor's office. You may have to bear the costs of the legal action initially, and you should consult a lawyer about this.

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

You withdraw from the study at any time and without giving a reason and this will not affect any NHS care you may be currently receiving.

Will my information be kept confidential?

This survey is anonymous and your identity will remain completely unknown. The completed survey will only be seen by researchers in our team.

What will happen to the results of this study?

The results of the study will be written up as part of two doctoral theses and may potentially be published in an academic journal and presented at conferences.

What if I want to know the results of the study?

This research study will end in autumn 2016. If you would like to know the results of this research, please e-mail your request to theresa.schwaiger.13@ucl.ac.uk. As this survey is anonymous it will not be possible to identify you from any publications that may arise out of this research.

Who is organising and funding the research?

This research is sponsored and funded by University College London and is carried out in cooperation with the NHS.

How have patients and public been involved in this study?

Two consultations with NHS service users and staff were carried out to gain feedback on the design and planning of this research study.

Who has reviewed this study?

This study has been reviewed by the UCL joint research office and by the NHS ethics committee.

Consent

If you decide to take part, please complete and sign the attached consent form.

Online Version

Research Participant Information on website (Version 3, 01/07/2015)

North East London 
NHS Foundation Trust



Page 1 on website:

Title of research: Self-disgust and its relationship with early childhood experiences and self-harm.

Name, Address and Contact Details of
Researchers:

**Ms Clare Drea, Ms Theresa Schwaiger & Dr Janet
Feigenbaum**

Sub-Department of Clinical Psychology

University College London

Gower Street

London WC1E 6BT

Researcher's Telephone: 

Researcher's Email:

Welcome!

Welcome to this website! We would like to invite you to participate in this exciting research study. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to read the following information carefully. If you would like more information please contact the researchers via e-mail or telephone.

What is this research about?

This research is an online survey that seeks to find out about the experience of self-disgust. Disgust is an emotion that is universal to all humans, yet it is a highly under-researched area. Many people report experiencing disgust about themselves which is known as self-disgust. Our study looks to assess how common feelings of self-disgust are as we know that some people report higher levels of self-disgust than others. Therefore, we are also interested in experiences that may lead to high levels of self-disgust (i.e. adverse early childhood experiences) and experiences that may result from feelings of self-disgust (i.e. deliberate self-harm).

What is this study trying to achieve?

Your responses will help us to learn more about how common the emotion of self-disgust is and to improve services and psychological therapies for people who experience high levels of self-disgust.

Why should I get involved?

For each participant who completes the survey, £1* will be donated to one of three charities:

MIND (Mental Health Charity)

EMERGENCE (service user led charity supporting individuals with personality disorders)

NSPCC (National Society for the Prevention of Cruelty to Children)

You can select which charity you would like your donation to go to once you have completed the survey.

*Donations will be capped at a maximum of £475

What will it involve?

This survey contains a total of seven questionnaires. Topics covered include personality style, possible experiences of self-disgust and self-harm, feelings about yourself, childhood experiences, and some background information about you. We are interested in your views whether you identify with these topics or not.

This online survey is anonymous and your identity will remain completely unknown. As this survey is anonymous it will not be possible to identify you from any publications that may arise out of this research.

How may taking part affect me?

The questions you will be asked may cover some topics that might be painful to think about. If you feel distressed while completing the survey, click on the 'help' icon displayed on each page. This will open up a new page which will provide you

with some information to help manage your distress and also recommend where to seek further support. This page will also provide the contact details of the researchers who you can contact directly if you feel distressed. If you are currently experiencing high levels of distress we would suggest completing this survey at another time.

Can I exit the survey any time?

On each page you will be able to withdraw your participation by clicking 'exit the survey'. The survey can only be completed in one sitting as it won't be possible to save responses and return to the survey at a later date.

What if there is a problem?

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated by members of staff you may have experienced due to your participation in the research, National Health Service or UCL complaints mechanisms are available to you. Please ask your research doctor if you would like more information on this.

In the unlikely event that you are harmed by taking part in this study, compensation may be available. If you suspect that the harm is the result of the Sponsor's (University College London) or the hospital's negligence then you may be able to claim compensation. After discussing with the researchers, please make the claim in writing to Dr Janet Feigenbaum who is the Chief Investigator for the research and is based at University College London. The Chief Investigator will then pass the claim to the Sponsor's Insurers, via the Sponsor's office. You may have to bear the costs of the legal action initially, and you should consult a lawyer about this.

Consent

By clicking 'next', 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 'next'. If you decide not to participate please click 'finish'.

Last page on website:

Thank you so much for participating!

This study will end in autumn 2016. If you would like to know the results of this research, please e-mail your request to [REDACTED].

If completing this set of questionnaires has left you feeling distressed please click on the 'help' icon and follow the instructions.

Please do not hesitate to contact the researchers if you have any questions (e-mail: [REDACTED] phone: [REDACTED]).

Thank you!

Page displayed after clicking 'finish':

Thank you so much for considering to take part in this research! This research study is looking for participants until February 2016. If you change your mind and decide

to participate at another time, please revisit this page using this link:
www.research-selfdisgust.com
Thank you!

Appendix H

Distress Management Sheet



Getting Help for Feelings of Distress

This sheet contains recommendations on how to best cope with your current distress and will also provide you with numbers of services you could contact to seek help.

Calming Exercise

The following exercise has been proven to help people in distress to feel calmer and less anxious. It is called 'Safe Place Imagery' and involves imagining yourself in a safe and peaceful place. Please follow these instructions:

If you notice any negative links or images entering your positive imagery, then discard that image and think of something else. Avoid using your home (or bed) as a 'safe place'.

You can create a new 'safe place' in your imagination.

Start by getting comfortable in a quiet place where you won't be disturbed, and take a couple of minutes to focus on your breathing, close your eyes, become aware of any tension in your body, and let that tension go with each out-breath.

Imagine a place where you can feel calm, peaceful and safe. It may be a place you've been to before, somewhere you've dreamed about going to, somewhere you've seen a picture of, or just a peaceful place you can create in your mind's eye. Some people have found it helpful to imagine themselves on a beach, on a forest meadow or at a waterfall.

Look around you in that place, notice the colours and shapes. What else do you notice?

Now notice the sounds that are around you, or perhaps the silence. Sounds far away and those nearer to you. Those that are more noticeable, and those that are more subtle.

Think about any smells you notice there.

Then focus on any skin sensations - the earth beneath you or whatever is supporting you in that place, the temperature, any movement of air, anything else you can touch.

Notice the pleasant physical sensations in your body whilst you enjoy this safe place.

Now whilst you're in your peaceful and safe place, you might choose to give it a name, whether one word or a phrase that you can use to bring that image back, anytime you need to.

You can choose to linger there a while, just enjoying the peacefulness and serenity. You can leave whenever you want to, just by opening your eyes and being aware of where you are now, and bringing yourself back to alertness in the 'here and now'.

Where to seek further help

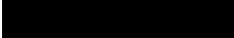
To talk directly to the researchers (Theresa Schwaiger or Clare Drea) please call xxx.

We would also recommend speaking to someone on your social network if you feel distressed.

These are the numbers of services that can help if you are feeling distressed:

Samaritans

Helpline Number: 08457 90 90 90 (Open 24 hours, 365 day a days)

 / www.samaritans.org

Healthcare professional

If you are currently using services contact your care coordinator, therapist or psychologist for advice and support.

GP

Contact your local GP

NHS Emergency and Urgent Care Service

Call 111 (use this 24 hour telephone helpline when you need help fast but it is not a 999 emergency)

www.nhs.uk/111

A&E

Visit your local A & E department in case of a 999 emergency

Online Version

'Help' page on website:

Getting Help for Feelings of Distress

This page contains recommendations on how to best cope with your current distress and will also provide you with numbers of services you could contact to seek help.

Calming Exercise

The following exercise has been proven to help people in distress to feel calmer and less anxious. It is called 'Safe Place Imagery' and involves imagining yourself in a safe and peaceful place. Please follow these instructions:

If you notice any negative links or images entering your positive imagery, then discard that image and think of something else. Avoid using your home (or bed) as a 'safe place'.

You can create a new 'safe place' in your imagination.

Start by getting comfortable in a quiet place where you won't be disturbed, and take a couple of minutes to focus on your breathing, close your eyes, become aware of any tension in your body, and let that tension go with each out-breath.

Imagine a place where you can feel calm, peaceful and safe. It may be a place you've been to before, somewhere you've dreamed about going to, somewhere you've seen a picture of, or just a peaceful place you can create in your mind's eye. Some people have found it helpful to imagine themselves on a beach, on a forest meadow or at a waterfall.

Look around you in that place, notice the colours and shapes. What else do you notice?

Now notice the sounds that are around you, or perhaps the silence. Sounds far away and those nearer to you. Those that are more noticeable, and those that are more subtle.

Think about any smells you notice there.

Then focus on any skin sensations - the earth beneath you or whatever is supporting you in that place, the temperature, any movement of air, anything else you can touch.

Notice the pleasant physical sensations in your body whilst you enjoy this safe place.

Now whilst you're in your peaceful and safe place, you might choose to give it a name, whether one word or a phrase that you can use to bring that image back, anytime you need to.

You can choose to linger there a while, just enjoying the peacefulness and serenity. You can leave whenever you want to, just by opening your eyes and being aware of where you are now, and bringing yourself back to alertness in the 'here and now'.

Where to seek further help

To talk directly to one of the researchers (Theresa Schwaiger or Clare Drea) please call xxx.

We would also recommend speaking to someone on your social network if you feel distressed.

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If you are currently using services contact your care coordinator, therapist or psychologist for advice and support.

GP

Contact your local GP

NHS Emergency and Urgent Care Service

Call 111 (use this 24 hour telephone helpline when you need help fast but it is not a 999 emergency)

www.nhs.uk/111

A&E

Visit your local A & E department in case of a 999 emergency

Appendix I

Standardised Assessment of Personality – Abbreviated Scale (SAPAS)

Standardised Assessment of Personality – Abbreviated Scale (SAPAS)

Only circle Y (yes) or N (no) in the case of question 3) if the patient thinks that the description applies *most of the time* and *in most situations*.

1. In general, do you have difficulty making and keeping friends? Y/N

(yes=1, no=0)

2. Would you normally describe yourself as a loner? Y/N

(yes=1, no=0)

3. In general, do you trust other people? Y/N

(yes=0, no=1)

4. Do you normally lose your temper easily? Y/N

(yes=1, no=0)

5. Are you normally an impulsive sort of person? Y/N

(yes=1, no=0)

6. Are you normally a worrier? Y/N

(yes=1, no=0)

7. In general, do you depend on others a lot? Y/N

(yes=1, no=0)

8. In general, are you a perfectionist? Y/N

(yes=1, no=0)

Appendix J

Self-disgust Scale Revised (SDS-R)

Self-Disgust Scale Revised (SDS-R) (Powell et al., 2015)

Appendix K

Disgust Propensity and Sensitivity Scale – Revised (DPSS-R)

Disgust Propensity and Sensitivity Scale – Revised (DPSS-R) (van Overveld et al., 2006)

Appendix L

Experience of Shame Scale (ESS)

Experiences of Shame Scale (ESS) (Andrews, Qian & Valentine, 2002)

Appendix M

Clinical Anger Scale (CAS)

Clinical Anger Scale (CAS)

INSTRUCTIONS: The group of items below inquire about the types of feelings you have. Each of the 21 groups of items has four options. For each item, read and identify the statement that best reflects how you feel. For example, you might choose A. If so, then you would select the letter (A).

Be sure to answer every question, even if you're not sure. Make sure you select only one statement from each of the 21 items. PLEASE BE HONEST IN RESPONDING TO THE STATEMENTS.

1.A. I do not feel angry.
B. I feel angry.
C. I am angry most of the time now.
D. I am so angry and hostile all the time that I can't stand it.

2.A. I am not particularly angry about my future.
B. When I think about my future, I feel angry.
C. I feel angry about what I have to look forward to.
D. I feel intensely angry about my future, since it cannot be improved.

3.A. It makes me angry that I feel like such a failure.
B. It makes me angry that I have failed more than the average person.
C. As I look back on my life, I feel angry about my failures.
D. It makes me angry to feel like a complete failure as a person.

4.A. I am not all that angry about things.
B. I am becoming more hostile about things than I used to be.
C. I am pretty angry about things these days.
D. I am angry and hostile about everything.

5.A. I don't feel particularly hostile at others.
B. I feel hostile a good deal of the time.
C. I feel quite hostile most of the time.
D. I feel hostile all of the time.

6.A. I don't feel that others are trying to annoy me.
B. At times I think people are trying to annoy me.
C. More people than usual are beginning to make me feel angry.
D. I feel that others are constantly and intentionally making me angry.

7.A. I don't feel angry when I think about myself.
B. I feel more angry about myself these days than I used to.
C. I feel angry about myself a good deal of the time.

- D. When I think about myself, I feel intense anger.
8.A. I don't have angry feelings about others having screwed up my life.
B. It's beginning to make me angry that others are screwing up my life.
C. I feel angry that others prevent me from having a good life.
D. I am constantly angry because others have made my life totally miserable.
9.A. I don't feel angry enough to hurt someone.
B. Sometimes I am so angry that I feel like hurting others, but I would not really do it.
C. My anger is so intense that I sometimes feel like hurting others.
D. I'm so angry that I would like to hurt someone.
10.A. I don't shout at people any more than usual.
B. I shout at others more now than I used to.
C. I shout at people all the time now.
D. I shout at others so often that sometimes I just can't stop.
11.A. Things are not more irritating to me now than usual.
B. I feel slightly more irritated now than usual.
C. I feel irritated a good deal of the time.
D. I'm irritated all the time now.
12.A. My anger does not interfere with my interest in other people.
B. My anger sometimes interferes with my interest in others.
C. I am becoming so angry that I don't want to be around others.
D. I'm so angry that I can't stand being around people.
13.A. I don't have any persistent angry feelings that influence my ability to make decisions.
B. My feelings of anger occasionally undermine my ability to make decisions.
C. I am angry to the extent that it interferes with my making good decisions.
D. I'm so angry that I can't make good decisions anymore.
14.A. I'm not so angry and hostile that others dislike me.
B. People sometimes dislike being around me since I become angry.
C. More often than not, people stay away from me because I'm so hostile and angry.
D. People don't like me anymore because I'm constantly angry all the time.
15.A. My feelings of anger do not interfere with my work.
B. From time to time my feelings of anger interfere with my work.
C. I feel so angry that it interferes with my capacity to work.
D. My feelings of anger prevent me from doing any work at all.

16.A. My anger does not interfere with my sleep.
B. Sometimes I don't sleep very well because I'm feeling angry.
C. My anger is so great that I stay awake 1—2 hours later than usual.
D. I am so intensely angry that I can't get much sleep during the night.
17.A. My anger does not make me feel anymore tired than usual.
B. My feelings of anger are beginning to tire me out.
C. My anger is intense enough that it makes me feel very tired.
D. My feelings of anger leave me too tired to do anything.
18.A. My appetite does not suffer because of my feelings of anger.
B. My feelings of anger are beginning to affect my appetite.
C. My feelings of anger leave me without much of an appetite.
D. My anger is so intense that it has taken away my appetite.
19.A. My feelings of anger don't interfere with my health.
B. My feelings of anger are beginning to interfere with my health.
C. My anger prevents me from devoting much time and attention to my health.
D. I'm so angry at everything these days that I pay no attention to my health and well-being.
20.A. My ability to think clearly is unaffected by my feelings of anger.
B. Sometimes my feelings of anger prevent me from thinking in a clear-headed way.
C. My anger makes it hard for me to think of anything else.
D. I'm so intensely angry and hostile that it completely interferes with my thinking.
21.A. I don't feel so angry that it interferes with my interest in sex.
B. My feelings of anger leave me less interested in sex than I used to be.
C. My current feelings of anger undermine my interest in sex.
D. I'm so angry about my life that I've completely lost interest in sex.

Appendix N

Inventory of Statements about Self-Injury (ISAS)

Inventory of Statements about Self-Injury (ISAS)

SECTION 1

This questionnaire asks about a variety of self-harm behaviours. Please only endorse a behaviour if you have done it intentionally (i.e., on purpose) and without suicidal intent (i.e., not for suicidal reasons).

1. Please estimate the number of times in your life you have intentionally (i.e., on purpose) performed each type of non-suicidal self-harm (e.g., 0, 10, 100, 500):

Cutting _____ Biting _____ Burning _____ Severe Scratching _____

Banging or Hitting Self _____ Interfering w/ Wound Healing (e.g., picking scabs) _____

Rubbing Skin Against Rough Surface _____ Sticking Self w/ Needles _____

Swallowing Dangerous Substances _____ Carving Pinching Pulling Hair _____

Other _____

***** **Important: If you have performed one or more of the behaviours listed above, please complete the final part of this questionnaire. If you have not performed any of the behaviours listed above, you are done with this particular questionnaire and should click 'next' at the bottom of the page to continue to the next questionnaire.**

2. If you feel that you have a *main* form of self-harm, please tick the behaviour(s) below that you consider to be your main form of self-harm.

Cutting

Biting

Burning

Severe Scratching

Banging or Hitting Self

Interfering w/ Wound Healing (e.g., picking scabs)

Rubbing Skin Against Rough Surface

Sticking Self w/ Needles

Swallowing Dangerous Substances

Carving Pinching Pulling Hair

Other

3. At what age did you:

First harm yourself? _____

Most recently harm yourself? _____ (approximate date – month/date/year)

4. Do you experience physical pain during self-harm?

YES SOMETIMES NO

5. When you self-harm, are you alone?

YES SOMETIMES NO

6. Typically, how much time elapses from the time you have the urge to self-harm until you act on the urge?

< 1 hour

1 - 3 hours

3 - 6 hours

6 - 12 hours

12 - 24 hours

> 1 day

7. Do/did you want to stop self-harming?

YES NO

SECTION 2. FUNCTIONS

Instructions

This inventory was written to help us better understand the experience of non-suicidal self-harm. Below is a list of statements that may or may not be relevant to your experience of self-harm. Please identify the statements that are most relevant for you:

⤴ Select **0** if the statement **not relevant** for you at all

⤴ Select **1** if the statement is **somewhat relevant** for you

⤴ Select **2** if the statement is **very relevant** for you

When I self-harm, I am ...		Response		
1.	... calming myself down	0	1	2
2.	... creating a boundary between myself and others	0	1	2
3.	... punishing myself	0	1	2
4.	... giving myself a way to care for myself (by attending to the wound)	0	1	2
5.	... causing pain so I will stop feeling numb	0	1	2
6.	... avoiding the impulse to attempt suicide	0	1	2
7.	... doing something to generate excitement or exhilaration	0	1	2
8.	... bonding with peers	0	1	2
9.	... letting others know the extent of my emotional pain	0	1	2
10.	... seeing if I can stand the pain	0	1	2
11.	... creating a physical sign that I feel awful	0	1	2
12.	... getting back at someone	0	1	2
13.	... ensuring that I am self-sufficient	0	1	2
14.	... releasing emotional pressure that has built up inside of me	0	1	2
15.	... demonstrating that I am separate from other people	0	1	2
16.	... expressing anger towards myself for being worthless or stupid	0	1	2
17.	... creating a physical injury that is easier to care for than my emotional distress	0	1	2
18.	... trying to feel something (as opposed to nothing) even if it is	0	1	2

physical

19.	... responding to suicidal thoughts without actually attempting suicide	0	1	2
20.	... entertaining myself or others by doing something extreme	0	1	2
21.	... fitting in with others	0	1	2
22.	... seeking care or help from others	0	1	2
23.	... demonstrating I am tough or strong	0	1	2
24.	... proving to myself that my emotional pain is real	0	1	2
25.	... getting revenge against others	0	1	2
26.	... demonstrating that I do not need to rely on others for help	0	1	2
27.	... reducing anxiety, frustration, anger, or other overwhelming emotions	0	1	2
28.	... establishing a barrier between myself and others	0	1	2
29.	... reacting to feeling unhappy with myself or disgusted with myself	0	1	2
30.	... allowing myself to focus on treating the injury, which can be gratifying or satisfying	0	1	2
31.	... making sure I am still alive when I don't feel real	0	1	2
32.	... putting a stop to suicidal thoughts	0	1	2
33.	... pushing my limits in a manner akin to skydiving or other extreme activities	0	1	2
34.	... creating a sign of friendship or kinship with friends or loved ones	0	1	2
35.	... keeping a loved one from leaving or abandoning me	0	1	2
36.	... proving I can take the physical pain	0	1	2
37.	... signifying the emotional distress I'm experiencing	0	1	2
38.	... trying to hurt someone close to me	0	1	2
39.	... establishing that I am autonomous/independent	0	1	2

Appendix O

Exploratory Factor Analysis of the ISAS NSSI functions

Rationale

A number of limitations and ambiguities in the measurement of the ISAS self-injury functions (Klonsky & Glenn, 2009) were noted. The items subsumed under the sub-scales 'toughness' and 'self-care' appeared to reflect intrapersonal rather than interpersonal functions or both. Interpersonal motives of NSSI such as 'creating a barrier between the self and others' and 'bonding with peers' were combined into the overarching 'interpersonal function' despite their contrasting nature. For the purpose of investigating whether self-disgust, shame and anger could predict functions of self-injury, a broad categorisation appeared to lack ecological validity. On the basis of face validity, items within the 'interpersonal boundary' sub-scale (e.g. demonstrating that I am separate from other people) and the 'autonomy' sub-scale (e.g. establishing that I do not need to rely on others for help) seemed to tap a similar construct. Some items in the 'sensation seeking' sub-scale (e.g. pushing my limits in a manner akin to skydiving) appeared to be more of intrapersonal than interpersonal nature and also displayed similarities to the 'toughness' sub-scale.

Given a considerable amount of literature on the ISAS (Glenn & Klonsky, 2011; Klonsky & Glenn, 2009), conducting a confirmatory factor analysis (CFA) was considered. A CFA requires identifying item-loadings a priori, derived from a strong theoretical background (Fields, 2009). However, it surfaced that the overarching two-factor solution of intrapersonal and interpersonal functions of NSSI was found through an exploratory factor analysis (EFA) of the 13 sub-scales. The 39 items had not been factor-analysed (Klonsky, Glenn, Styer, Olino & Washburn, 2015). An EFA was also never conducted using a population of individuals who screened positively for PD. Similar to Klonsky and colleagues (2015) who investigated the structure of the ISAS in a clinical sample with Axis-I diagnoses, an EFA on the item-level was thought to help address the limitations mentioned above. An EFA was chosen over a principal component analysis (PCA) because previous research and a

theory about the relationship between the items existed, whereas a PCA is thought more appropriate for an initial exploration of patterns between variables (Brown, 2009a).

Procedure

An EFA was conducted on the 39 items using oblique rotation (Promax) (N=144). This rotation method is chosen in cases where the theory suggests that the factors are not independent (Brown, 2009b; Gorsuch, 1983). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO=.82. Bartlett's test of sphericity $\chi^2(741)=3556.02$, $p=.000$, indicated that correlations between items were sufficiently large for an EFA. In order to test for collinearity the determinant value was examined. The value of 0.000892 (greater than the necessary value of 0.00001) showed that multicollinearity was not a problem. An initial analysis was run to obtain Eigenvalues for each factor in the data. Ten factors had Eigenvalues over Kaiser's criterion of one and in combination explained 72.6% of the variance. The scree plot was slightly ambiguous and showed inflexions that suggested retaining four factors. However, an inspection of the item loadings did not yield clinically meaningful interpretations of these four factors. Furthermore, the overall variance explained by the four-factor solution dropped to 51.7%. A two-factor solution (interpersonal versus intrapersonal functions) has so far been reported in the literature. This factor solution was examined but the results within the current sample did not confirm a two-factor solution. In conclusion, given the Kaiser's criterion suggesting ten factors and the clinical relevance and interpretive validity of these 10 factors, the ten factor solution was retained in the final analysis.

A total of two items were excluded because they did not contribute to a simple factor structure and failed to meet the minimum criterion of having a primary factor loading of .3 or above. This was the case for item seven ('doing something to generate

excitement or exhilaration') as well as item 24 ('proving to myself that my emotional pain is real'). Two items double-loaded on two factors. According to Fabrigar & Wegener (2012) double-loading items can clarify the nature of factors at work and do not necessarily have to be deleted, particularly in cases where theory building is of greater concern than developing a measure. Item 22 ('Seeking care or help from others') double-loaded on the factor one 'pulling others close' (.344) as well as factor eight 'Communicating distress' (.589) and was retained with the latter due to the higher loading. Item 31 ('Making sure I am alive when I don't feel real') loaded on factor nine 'self-care' (.438) as well as factor 10 'Anti-dissociation' (.381). For interpretive reasons the item was retained with factor 10 despite the fact that it loaded higher on factor nine.

Final results

For the final stage, an Exploratory Factor Analysis (Principal Axis Factoring in SPSS V.23) of the 37 items was conducted using Promax rotations. The rotated solution explained 65.8% of the variance. All items had primary loadings above .4 and .5, except for item 31 (as above). Table b displays the final factor loading matrix.

A 10-factor solution was obtained instead of the 13 sub-scales in the original ISAS (Klonsky & Glenn, 2009). Four of the intrapersonal functions/sub-scales reported in the original ISAS were retained (affect regulation, anti-dissociation, self-punishment, anti-suicide) as well as the 'self-care' function which was originally placed with interpersonal functions of NSSI. The remaining items formed five new functions (pushing others away, pulling others close, passive aggression, communicating distress, showing strength). Please refer to table a for details.

Internal consistency. The internal consistency of the 37-item scale was found to be high ($\alpha=.92$). Cronbach's alpha was also examined for each of the ten factors. A high

internal consistency was achieved for factor one 'Pulling others close' ($\alpha=.92$), factor two 'Pushing others away' ($\alpha=.80$), factor three 'Showing strength' ($\alpha=.84$), factor four 'Passive aggression' ($\alpha=.85$), factor five 'Anti-suicide' ($\alpha=.88$), factor seven 'Self-punishment' ($\alpha=.87$) and factor 10 'Anti-dissociation' ($\alpha=.87$). Moderate but still satisfactory internal consistency was found for factor eight 'communicating distress' ($\alpha=.78$), factor nine 'Affect regulation' ($\alpha=.79$) and factor six 'Self-care' ($\alpha=.75$).

Table a

10-Factor solution of NSSI functions (37 items)

Factor	No.	Item	Original sub-scale
1. Pulling others close	34	Creating a sign of friendship or kinship with friends or loved ones	Peer bonding
	8	Bonding with peers	Peer bonding
	21	Fitting in with others	Peer bonding
	20	Entertaining myself or others by doing something extreme	Sensation seeking
2. Pushing others away	2	Creating boundary between myself and others	Interp. boundaries
	15	Demonstrating that I am separate from people	Interp. boundaries
	28	Establishing a barrier between myself and others	Interp. boundaries
	26	Demonstrating that I do not need to rely on others for help	Autonomy
3. Showing strength	39	Establishing that I am autonomous/independent	Autonomy
	23	Demonstrating I am tough or strong	Toughness
	36	Proving I can take the physical pain	Toughness
	10	Seeing if I can stand the pain	Toughness
4. Passive aggression	33	Pushing my limits in a manner akin to skydiving or other extreme activities	Sensation seeking
	13	Ensuring that I am self-sufficient	Autonomy
	12	Getting back at someone	Revenge
	25	Getting revenge against others	Revenge
5. Anti-suicide	38	Trying to hurt someone close to me	Revenge
	35	Keeping a loved one from leaving or abandoning me	Interp. Influence
	6	Avoiding the impulse to attempt suicide	Anti-suicide
6. Self-care	32	Putting a stop to suicidal thoughts	Anti-suicide
	19	Responding to suicidal thoughts without actually attempting suicide	Anti-suicide
	4	Giving myself a way to care for myself	Self-care
	16	Creating a physical injury that is easier to care for than my emotional distress	Self-care

	30	Allowing myself to focus on treating the injury which can be gratifying or satisfying	Self-care
7. Self-punishment	16	Expressing anger at myself for being worthless and stupid	Self-punishment
	3	Punishing myself	Self-punishment
	29	Reacting to feeling unhappy with myself or disgusted by myself	Self-punishment
8. Communicating distress	9	Letting others know the extent of my emotional pain	Interp. influence
	37	Signifying the emotional distress I am experiencing	Marking distress
	11	Creating a physical sign that I feel awful	Marking distress
	22	Seeking care or help from others	Interp. Influence
9. Affect regulation	1	Calming myself down	Affect-regulation
	14	Releasing emotional pressure that has built up inside me	Affect-regulation
	27	Reducing anxiety, frustration, anger or any other emotion	Affect-regulation
10. Anti-dissociation	5	Causing pain so I will stop feeling numb	Anti-dissociation
	18	Trying to feeling something (as opposed to nothing) even if it is physical pain	Anti-dissociation
	31	Making sure I am still alive when I don't feel real	Anti-dissociation

Table b

Pattern Matrix – EFA ISAS functions

Item	Factor 1 Pulling others close	Factor 2 Pushing others away	Factor 3 Showing strength	Factor 4 Passive aggression	Factor 5 Anti-suicide	Factor 6 Self-care	Factor 7 Self- punishment	Factor 8 Communicating distress	Factor 9 Affect regulation	Factor 10 Anti- dissociation
21	.908									
34	.904									
8	.841									
20	.782									
28		.909								
15		.869								
2		.578								
26		.562								
39		.519								
36			.956							
23			.849							
10			.699							
33			.508							
13			.432							
38				.851						
12				.796						
25				.779						
35				.423						
6					.920					
32					.839					
19					.734					

Item	Factor 1 Pulling others close	Factor 2 Pushing others away	Factor 3 Showing strength	Factor 4 Passive aggression	Factor 5 Anti-suicide	Factor 6 Self-care	Factor 7 Self- punishment	Factor 8 Communicating distress	Factor 9 Affect regulation	Factor 10 Anti- dissociation
30						.923				
4						.861				
17						.578				
31						.432				.369
16							.899			
3							.841			
29							.757			
9								.809		
11								.657		
37								.649		
22	.337							.600		
27									.949	
14									.632	
1									.590	
5										.930
18										.654

Note. Coefficients below .3 were excluded; N=144

Appendix P

Childhood Abuse and Trauma Scale (CATS)

Sexual Abuse Subscale

Childhood Abuse and Trauma Scale (CATS) – Sexual Abuse Subscale

(Sanders & Beckerlausen, 1995)

Appendix Q

Results of (Hierarchical) Multiple Regression Analyses

Table a

Bootstrap beta values for multiple regression: Predictors of 'self-punishment'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Constant	.326	.775	.665	-.415	2.543
Shame	.027	.015	.075	.002	.061
Anger	-.003	.014	.89	-.036	.021
Self-disgust	-.035	.015	.023*	-.035	.018

Note. *p<.05; R² Change: F(3,141)=14.24, p=.000; CI=Confidence interval; BCa=bias-corrected and accelerated

Table b

Bootstrap beta values for hierarchical multiple regression: Predictors of 'anti-suicide'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Step 1					
Constant	1.14	.431	.008**	.408	2.08
Gender	1.18	.470	.011*	.072	2.12
Step 2					
Constant	-.303	.834	.728	-.415	2.543
Gender	.812	.463	.081	.498	2.204
Shame	-.009	.017	.598	.002	.061
Anger	.029	.018	.122	-.036	.021
Self-disgust	.038	.015	.017*	-.035	.018

Note. *p<.05; **p<.01; gender: 0=female, 1=male; R² Change: F(4,133)=6.8, p=.000; CI=Confidence interval; BCa=bias-corrected and accelerated

Table c

Bootstrap beta values for multiple regression: Predictors of 'communicating distress'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Constant	.041	.953	.963	-.415	2.543
Shame	.053	.017	.002**	.002	.061
Anger	.022	.018	.216	-.036	.021
Self-disgust	-.035	.017	.035*	-.035	.018

Note. *p<.05; **p<.01; R² Change: F(3,141)=4.4, p=.005; CI=Confidence interval; BCa=bias-corrected and accelerated

Table d

Bootstrap beta values for hierarchical multiple regression: Predictors of 'affect regulation'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Step1					
Constant	3.09	.455	.001	2.19	4.05
Gender	1.56	.477	.003	.653	2.456
Step 2					
Constant	1.05	.79	.166	-.415	2.543
Gender	1.42	.478	.004**	.498	2.204
Shame	.034	.015	.026*	.002	.061
Anger	-.009	.013	.483	-.036	.021
Self-disgust	-.006	.014	.664	-.035	.018

Note. *p<.05; **p<.01; gender: 0=female, 1=male; R² Change: F(4,133)=6.4, p=.000; CI=Confidence interval; BCa=bias-corrected and accelerated

Table e

Bootstrap beta values for hierarchical multiple regression: Predictors of 'self-care'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Step1					
Constant	1.18	.157	.001	.866	1.49
Sexual abuse	.069	.039	.061	.006	.155
Step 2					
Constant	-.951	.643	.143	-2.26	.325
Sexual abuse	.064	.041	.113	-.007	.159
Shame	.027	.012	.023*	.005	.052
Anger	-.009	.019	.659	-.045	.024
Self-disgust	.003	.013	.808	-.025	.028

Note. *p<.05; **p<.01; R² Change: F(4,140)=3.54, p=.000; CI=Confidence interval; BCa=bias-corrected and accelerated

Table f

Bootstrap beta values for multiple regression: Predictors of 'passive aggression'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Constant	.159	.571	.759	-.942	1.34
Shame	.015	.010	.132	-.003	.033
Anger	.037	.014	.007**	.010	.064
Self-disgust	-.019	.010	.055	-.04	-.001

Note. ** $p < .01$; R^2 Change: $F(3,141)=3.28$, $p=.023$; CI=Confidence interval; BCa=bias-corrected and accelerated

Table g

Bootstrap beta values for hierarchical multiple regression: Predictors of 'showing strength'

Predictor	Beta	Standard Error Beta	p-value	BCa 95% CI (Lower)	BCa 95% CI (Upper)
Step1					
Constant	1.09	.178	.001	.767	1.43
Sexual abuse	.148	.052	.006	.055	.268
Step 2					
Constant	.783	.985	.419	-1.17	2.8
Sexual abuse	.132	.058	.033	.023*	.26
Shame	-.002	.016	.915	-.035	.027
Anger	-.014	.025	.589	-.034	.058
Self-disgust	-.005	.017	.746	-.03	.041

Note. * $p < .05$; R^2 Change: $F(4,140)=3.52$, $p=.000$; CI=Confidence interval; BCa=bias-corrected and accelerated