Dissociative Symptoms and the Quality of Structural Integration in Borderline Personality Disorder

Shirey Sole

D.Clin.Psy.

Thesis (Volume 1), 2014

University College London

Declaration

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

Signature:

Date:

Overview

This thesis explores the etiology and characteristics of dissociation and structural integration in borderline personality disorder (BPD). This dissertation is a part of a joint project co-led with Daniel Ghossain (2014). Part 1, the literature review, evaluates the efficacy of psychological interventions in treating dissociation and the impact of dissociation on therapy outcome. 20 randomized control trials and observational studies were reviewed. Psychological interventions were not superior to treatment as usual. Outcome of dissociation was moderated by dissociation at baseline and application of narrative based therapeutic techniques. Standard interventions for BPD show promising results for effectively targeting dissociation. However, further research is required.

Part 2, the empirical paper, assesses the relevance of structural integration in understanding BPD. The etiology of dissociative experiences in BPD was of particular interest. As expected the results show that BPD patients present with distinct personality structure compared to healthy controls. History of adverse early experiences and level of psychopathology were associated with the quality of structural integration. The impact of childhood trauma on dissociation was partially mediated by structural integration, suggesting of a complex developmental trajectory of this symptom of BPD.

Part 3, presents a critical appraisal of the process of undertaking this research. It reviews methodological and theoretical issues in the diagnosis of BPD, study of dissociation, and structural integration that were encountered while writing this thesis. This section also reflects on the challenges of the study and the learning points that can inform future research.

Table of Contents

List of Tables

Part 1: Literature Review

Part 2: Empirical Paper

List of Figures

Acknowledgements

This thesis would have not been possible with out the support and guidance of many people who helped me throughout this project. Firstly, I would like to thank my supervisor, Professor Peter Fonagy. I am very grateful for the opportunity to work with him. His invaluable support, vast knowledge and experience has taught me a great deal about theory and the study of borderline personality disorder. His enthusiasm and dedication to research is inspiring. I would also like to thank my second supervisor, Dr. Tobias Nolte, who supported me throughout this project.

I would also like to thank all the participants who took part in the study. I admire your generosity and willingness to volunteer your time and your experiences to benefit this study. I am also thankful to the research team that I was fortunate enough to work with. Thank you to all my colleagues for your detection to this project. A special thank you to Natasha Smyth and Sarah Carr who coordinated and arranged the assessments, entered the data and made sure that this study ran smoothly. This work would have not been possible without your hard work and support. A big thanks to Zoe Given-Wilson, for showing constant care and interest in my thesis and for proof reading my work.

Finally, I would like to extend huge thanks to my family and friends, particularly my parents and my partner, who supported me throughout completing this thesis and my training. I am also grateful to my fellow trainees, for all their support. Your friendship has helped me find the strength to keep going even in the most challenging moments along the way.

Part 1: Literature Review

Are Psychological Interventions for BPD Effective in Reducing Dissociative Symptoms?

Abstract

Background

Transient dissociation is a core feature of borderline personality disorder (BPD). Dissociation is characterized by detachment from reality, which can be mild (e.g. daydreaming) to severe (e.g. depersonalization, amnesia). High levels of dissociation are linked to more severe psychopathology and likely to impede therapy effectiveness.

Objective

Assessing the efficacy of psychological interventions in reducing dissociation in BPD and the impact of dissociation on therapy outcome.

Methods

An electronic search of Psychinfo, Medline and Embase along with a hand search of relevant papers identified 20 studies.

Results

Psychological interventions were not found to be superior to treatment as usual. A small number of studies showed that higher dissociation at baseline predicted greater improvement. The use of narrative building techniques also showed related to reduce dissociation.

Conclusion

The evidence-base for treating dissociation is fairly limited. Standard interventions for BPD show promising results, but further research is required.

1. Introduction

Borderline personality disorder (BPD) is characterized by pervasive difficulties in interpersonal, behavioral and emotional functioning. Dissociation under stress is a diagnostic criterion for BPD according to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association [APA], 2013). Studies show that dissociative symptoms are more prevalent in BPD patients compared to healthy controls, other personality disorders and general psychiatric patients (Ross, 2007; Simeon, Nelson, Elias, Greenberg, & Hollander, 2003; Zanarini, Ruser, Frankenburg, Hennen, & Gunderson, 2000). Dissociative experiences can be highly disturbing and are likely to pose significant challenge to the implementation of an effective intervention (Barnow et al., 2010). However, it is unclear how effective psychological interventions are in treating dissociation in this client group.

Dissociation is manifested in a disruption of perception, consciousness, identity and memory (APA, 2013). It involves a process of detachment from a potentially overwhelming emotional content of a trauma (Barnow et al., 2011). This can take the form of memory lapses (i.e. dissociative amnesia); derealization, in which the external world is experienced as unreal; and/or depersonalization, when an individual feels like an external observer of the situation. On a non-pathological level dissociation can be experienced as day-dreaming or being absorbed in a thought or activity. In the severe end of the spectrum dissociation can be a highly disturbing experience for the individual.

1.1. Dissociation in BPD

Dissociation in BPD has been associated with higher frequency of suicidal and self-harming behaviours, as well as chronic co-morbid Axis I disorders (Shearer, 1994). Studies show that majority of BPD patients report non-pathological and pathological dissociative symptoms, which may meet the threshold of an Axis I dissociative disorder diagnosis (Conklin & Westen, 2005; Goodman et al., 2003; Korzekwa, Dell, Links, Thabane, & Fougere, 2009; Ross, 2007; Sar et al., 2003). Others can experience one or more dissociative symptoms without meeting the criteria for co-morbid dissociative disorder (DD) diagnosis. The literature on this sub-group is limited and it remains poorly understood (Korzekwa et al., 2009).

Physical and sexual abuse, as well as emotional neglect, are associated with the development of pathological dissociation (Spitzer, Barnow, Freyberger, & Grabe, 2006). Dissociation in BPD has been linked to the experience of childhood abuse (Ross-Gower, Waller, Tyson, & Elliott, 1998; Simeon et al., 2003; Van Den Bosch, Verheul, Langeland, & Van Den Brink, 2003). However, dissociation can also be mediated by witnessing violence, sexual assault as an adult or substance misuse (Shearer, 1994; Simeon et al., 2003; Van Den Bosch et al., 2003; Zanarini et al., 2000). Patients with co-occurring dissociative disorder and BPD are more likely to require longer and more extensive support from the healthcare system (Chu, 1998).

1.1.1. Measuring dissociation in BPD

The study of dissociation in BPD has been heavily criticized due to certain methodological problems. The majority of studies do not exclude severe cases of

dissociative or substance abuse disorders, which are likely to confound the outcome of therapy (Sar & Ross, 2006; Van Den Bosch, et al., 2003). Furthermore, the literature on dissociation in BPD is mostly based on self-report measures and lacks variety in the assessment tools administered.

1.2. Psychological interventions

Spitzer et al. (2006) hypothesize that the negative emotions arising in psychotherapy are likely to trigger dissociation in vulnerable individuals, which may impede the effectiveness of the intervention. Accordingly, dissociation has been found to be a predictor of treatment response and relapse rates in a wide variety of non-psychotic psychopathologies (Michelson, June, Vives, Testa, & Marchione, 1998). A recent systematic review of moderators of outcome in BPD (Barnicot et al., 2012) found that higher dissociation at baseline predicted greater improvement in dissociation at outcome. Conflicting results were found for the role of dissociation as a moderator of general psychopathology. The authors suggest this might be due to variation in measurement methods. It is difficult to establish the impact of dissociation on therapy outcome based on this review, as the evidence base is so limited. The review did not assess whether psychotherapies are effective in reducing dissociation.

The efficacy of psychological interventions for BPD was assessed in a recent Cochrane review (Stoffers et al., 2012). The review found 28 randomized control trials (RCT), showing that there has been a significant growth in evidence base for BPD in the last six years since the last review was published (Binks et al., 2006). Table 1 details the RCTs that have been published to date, which updates the list of studies covered in

previous reviews. The main conclusion of the review was that psychotherapy is key in providing an effective treatment for people with BPD. They found that dialectical behavioral therapy (DBT) was most studied intervention, followed by mentalization-based therapy (MBT), transference focused psychotherapy (TFP) and schema focused therapy (SFT). However, very few studies measured the frequency of dissociative experiences or formally assessed the presence of dissociative symptoms. The authors report mix results in regards to the outcome of dissociation, with DBT and SFT showing improvements in dissociation. However the findings regarding dissociation were not consistently separated from other psychotic symptoms or more general cognitive impairments.

1.3. Aims and objectives

This review aims to add to the current understanding of what helps reduce dissociation in BPD, by critically assessing RCTs, as well as observational studies. RCT is considered the gold standard of efficacy studies (National Institute for Health and Care Excellence; NICE, 2004). The strongest evidence base for treatment of BPD is based on a limited amount of RCT studies. Reviewing observational studies can help evaluate the applicability of psychological interventions in everyday practice. RCTs often use conservative inclusion criteria resulting in samples, which are usually more homogenous than the client group referred to mental health services. Furthermore, RCTs often require significant resources, which may limit the breadth of interventions studied and published. Despite the limited internal validity of non-randomized studies, they can provide a wider view of the current practice and highlight possible targets for future

research. Focusing on dissociation in BPD can help improve understanding of this distressing difficulty and promote the importance of this area for further research.

The following questions will be considered:

1. Are psychological interventions for BPD effective in reducing dissociation?
2. Is dissociation a moderator of therapy outcome in BPD?

Table 1. Summary of RCTs assessing psychological interventions for BPD

Study	Sample	N	Intervention	Outcome variables		Measure of dissociation
				Self report	Observer rated	
Bateman & Fonagy (1999)	BPD	38	MBT oriented partial hospitalization vs. General psychiatric care	Interpersonal problems, depression, anxiety, general psychopathology	Self harming behaviour/suicide attempts, dropout rates	
Bateman & Fonagy (2009)	BPD + suicide attempt/DSH within last 6m	134	Outpatient MBT vs. Structural clinical management	Interpersonal problems, depression, general psychopathology	Suicidal ideation, self harming behaviour, mental health status	
Bellino, Zizza, Rinaldi, & Bogetto (2006; 2007)	BPD + mild-moderate depression	39	Fluoxetine+ IPT vs. Fluoxetine +clinical management		Depression, mental health status, anxiety	
Bellino, Rinaldi, & Bogetto (2010)	BPD	55	Fluoxetine+ IPT vs. Fluoxetine+clinical management	Social and occupational functioning, subjective quality of life	Anxiety, BPD severity, depression, general symptomatolgy	
Blum et al. (2008)	BPD	124	STEPPS vs. TAU	BPD severity, impulsivity, depression, general psychopathology	Affective instability, interpersonal problems, cognitive disturbance, mental health status	
Bos, Van Wel, Bas, & Verbraak (2010)	BPD	168	STEPPS group +limited individual therapy vs. TAU	BPD severity, interpersonal problems, general psychopathology	Impulsivity, self harming behaviour	
Carter, Willcox, Lewin, Conrad, & Bendit (2010)	BPD	73	DBT vs. TAU +WL	Interpersonal problems, mental health status	Self harming behaviour	
Clarkin, Levy, Lenzenweger, & Kernberg (2007)	BPD	90	DBT vs. TFP vs. Dynamic supportive psychotherapy	Suicidality, anger, impulsivity, anxiety, depression and social adjustment		

Cottraux et al. (2009)	BPD	65	CT vs. Rogerian supportive therapy	Impulsivity, suicidality, depression, anxiety	Self harming behaviour, mental health status	
Davidson et al. (2006)	BPD	106	CBT+TAU vs. TAU	Interpersonal problems, depression, anxiety, general psychopathology	Suicidality, self-harming behaviour	
Doering et al. (2010)	BPD	104	TFP vs. Treatment by experienced community psychotherapists (TBE)	Depression, anxiety, general psychopathology	BPD severity, suicidality, self-harming behaviour	
Farrell, Shaw, &Webber (2009)	BPD	32	Group SFT+ individual psychotherapy treatment as usual vs. PTAU	BPD severity, general psychopathology	BPD psychopathology, global functioning	
Feigenbaum et al. (2011)	Cluster B PD (93% BPD)	41	DBT vs. TAU	General symptomatolgy, PTSD severity, anger, depression, dissociation	Self-harm and suicide attempts, treatment history, aggression	DES-II
Giesen-Bloo et al. (2006)	BPD	86	SFT vs. TFP	__	Borderline severity, general psychopathology,	BPDSI-IV dissociation and paranoid ideation subscale
Gratz & Gunderson (2006)	BPD	25	Emotion regulation group intervention +TAU vs. TAU+WL	BPD severity, affective instability, impulsivity, self-harming behaviour, depression, anxiety	___	
Gregory et al. (2008)	BPD + active alcohol abuse or dependence	30	DDP vs. TAU	BPD severity, dissociation, depression, anxiety	Self-harming behaviour	DES
Jahangard et al. (2012)	BPD +depression	30	Emotional intelligence training vs. TAU	Emotional intelligence	Depression	

Jørgensen et al. (2013)	BPD	85	Combined MBT[b] vs. Supportive psychotherapy	Symptom severity, depression, anxiety, social adjustment, interpersonal functioning	Overall severity of disturbance	
Koons et al. (2001)	BPD	28	DBT vs. TAU	Anger, depression, suicidality, dissociation	BPD severity, self harming behaviour, anxiety	DES
Linehan, Armstrong, Suarez, Allmon, & Heard (1991)	BPD	61	DBT vs. TAU	Suicidal ideation, depression, generalized hopelessness, positive expectancies	Parasuicidality, treatment history	
Linehan, Tutek, Heard, & Armstrong (1994)	BPD	26	DBT vs. TAU	Anger	Mental health status	
Linehan et al. (1999)	BPD + substance use disorders	28	DBT vs. TAU		Substance use	
Linehan et al. (2002)	BPD+ opiate dependence	23	DBT vs. Comprehensive validation therapy	General symptomatolgy	Dropout rates, substance misuse, parasuicidality, social adjustment, general functioning	
Linehan et al. (2006)	BPD	101	DBT vs. Non-behavioural community treatment by experts	Suicide ideation, therapeutic relationship and patient introject	Depression, suicidality, treatment history	
McMain et al. (2009)	BPD	190	DBT vs. General psychiatric management according to APA guideline recommendations	Anger, interpersonal problems, depression, general psychopathology	BPD severity, parasuicidality	

Moen et al. (2012)	Borderline personality disorder	29	Condensed DBT[a] + Divalproex vs. Condensed DBT+ placebo	General psychopathology	Depression, BPD severity, impulsivity	
Morey, Lowmaster, & Hopwood (2010)	BPD	16	MACT vs. MACT+TA		BPD severity, suicidality, affective, interpersonal problems, identity disturbance	
Nadort et al. (2009)	BPD	62	SFT vs. SFT+ therapist telephone assistance		Borderline severity, general psychopathology, anger, affective instability, chronic feelings of emptiness, impulsivity, self harming behaviour, interpersonal problems, avoidance of abandonment, identity disturbance, dissociation/stress-related paranoid ideation	BPDSI-IV dissociation and paranoid ideation subscale
Priebe et al. (2012)	PD + min. 5 days of self harm in last year	40	DBT vs. TAU	Frequency and types of self harm, quality of life	Symptom severity, psychotic symptoms	
Simpson et al. (2004)	BPD	25	DBT +Fluoxetine vs. DBT+ Placebo	Depression, anxiety, aggression, dissociation, anger	Global functioning	DES

Soler et al. (2009)	BPD	59	DBT vs. Standard group therapy	Mental health status	BPD severity, anger, affective instability, chronic feelings of emptiness, impulsivity, psychotic symptoms, depression, anxiety, general psychopathology
Turner (2000)	BPD	24	DBT oriented treatment vs. Client centred therapy	Suicidal ideation, depression, anxiety	Depression, anger, impulsivity, emotional instability, psychotic symptoms
Van den Bosch, Koeter, Stijnen, Verheul, & Van den Brink (2005)	BPD + substance abuse problems	64	DBT vs. TAU		Impulsivity, parasuicidal behaviour
Weinberg, Gunderson, Hennen, & Cutter (2006)	BPD +self harming behaviour	30	MACT vs. TAU	___	Suicidality, parasuicidality
Zanarini, & Frankenburg (2008)	BPD	50	Psycho-education workshop vs. WL		Impulsivity, disturbed relationships

Note: [a] 16 week program; [b] included group and individual therapy; BPD= borderline personality disorder; DSH= deliberate sel-harm; PTSD= post-traumatic stress disorder; MBT= mentalization based therapy; IPT= interpersonal therapy; STEPPS= systems training for emotional predictability and problem solving for borderline personality disorder; TAU=treatment as usual; DBT= dialectical behavioural therapy; WL= waiting list; CBT= cognitive behavioural therapy CT= cognitive therapy; SFT= schema-focused therapy; TFP= transference-focused psychotherapy; PTAU= psychotherapy TAU; DDP= dynamic deconstructive psychotherapy; MACT: manual-assisted cognitive treatment

2. Methods

2.1. Search strategy

Selected electronic databases (Psychinfo, Medline and Embase) were searched. A comprehensive search of titles and abstracts of papers was carried out to identify all relevant studies. The search results were limited to papers available in English, adult participants and peer review journals. All papers published before the 21st of December 2013 were searched. The reference sections of two previous reviews (Barnicot et al., 2012; Stoffers et al., 2012) and of papers selected from the initial search were also reviewed to identify additional studies that might be relevant.

2.2. Search terms

The same search terms were used in all three databases. The search terms were in part derived from previous reviews assessing psychological interventions for BPD (Barnicot et al., 2012; Binks et al., 2006; Stoffers et al., 2012). Core symptoms of dissociation (e.g. derealization, depersonalization) were used as search terms for a more thorough search. The term 'dissociative disorder' was not used in the search, as it mostly yielded studies that were not relevant for this review. The search was divided into three main domains: dissociation, borderline personality disorder and psychological treatment. Each concept was searched separately at first to minimize error and then combined with the other domains using 'AND'.

The following search string was applied:

Borderline personality disorder OR BPD OR borderline condition* OR Borderline patholog*

AND

Dissociation OR dissociative experience* OR dissociative symptom* OR dissociative episode* OR dissociative disorder OR depersonalization OR derealization OR amnesia

AND

Psychosocial treatment OR cognitive therapy OR behavio* therapy OR psychotherapy OR cognitive behavior therapy OR evidence based practice OR treatment outcome* OR intervention OR treatment effectiveness evaluation

(Note: * indicates that the term was truncated to allow for variations in keywords.)

2.3. Study selection

The abstracts of all papers found in the initial search and the full text of selected studies were screened and evaluated according to the inclusion and exclusion criteria (Table 2).

Table 2. Inclusion and exclusion criteria

Inclusion criteria
90% or more of the participants in the study met at least 4 criteria of the DSM-IV for BPD diagnosis
Participants completed a psychological intervention aiming to reduce symptom severity
Therapy was delivered by qualified and experienced clinicians
Dissociative symptoms were quantitatively measured

Empirically based studies using quantitative measurements
Exclusion criteria
Studies assessing populations under 18 years old
Studies in which treatment of BPD was not the primary focus
Studies that did not include a component of psychological treatment or did not separate between different therapeutic models.
Case series studies

2.4. Method of appraising studies

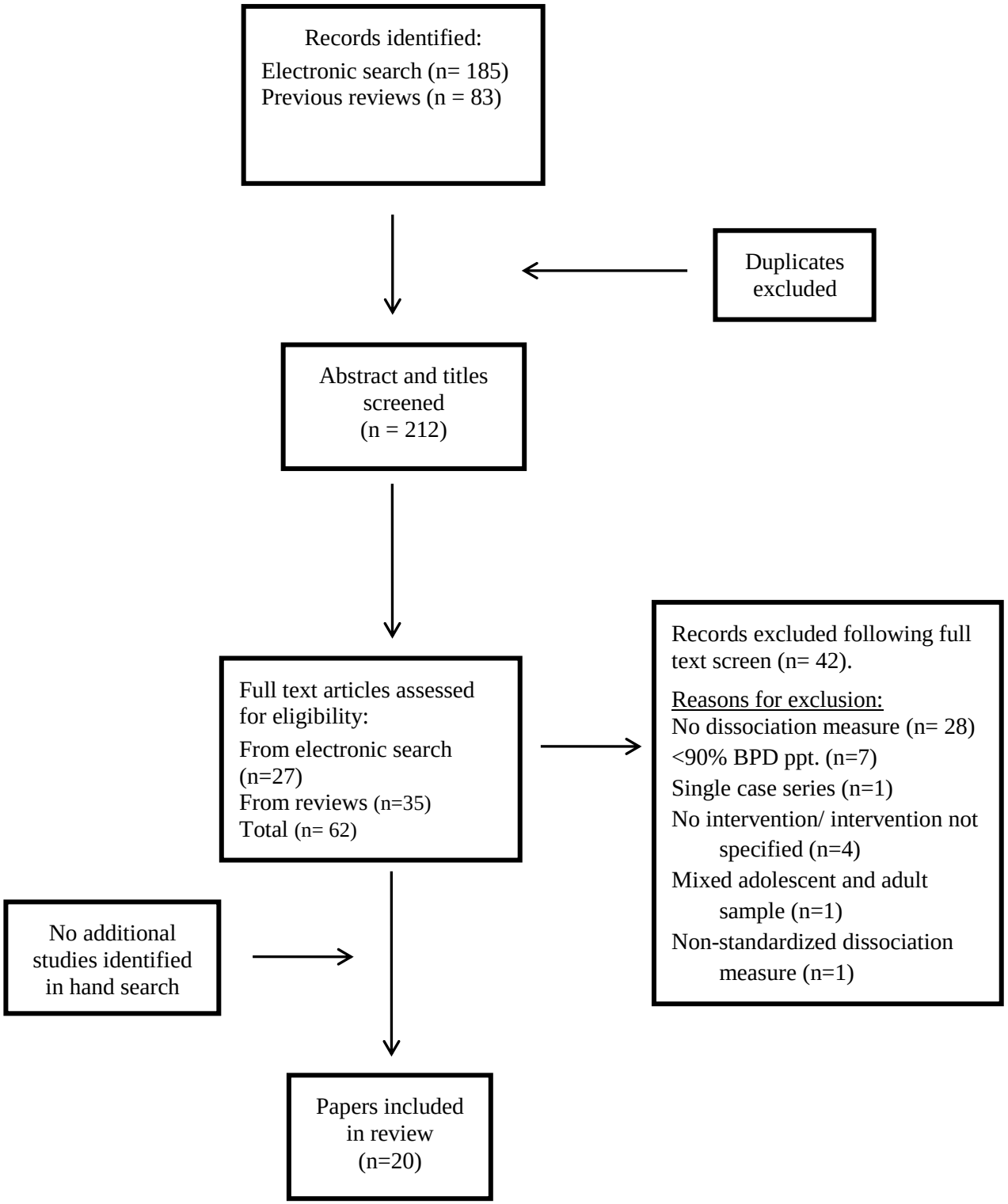
The quality of studies included was assessed using a checklist constructed by Downs and Black (1998) and updated by Cahill, Barkham and Stiles (2010). This modified version of the checklist was adapted to make it more suitable for practice-based evidence. This measure is designed for the assessment of both randomized control trials and observational studies in healthcare settings. The checklist is composed of 32 items (Appendix 1), assessing a range of quality criteria. Each item is scored a point if the criteria defined by the authors was met and zero if it was not, or if insufficient information was provided. The checklist yields an overall quality score and four sub-scales: (1) quality of reporting (11 items); (2) external validity (11 items); (3) internal reliability (5 items); (4) internal validity- confounding (selection) bias (5 items). The checklist has been found to have high internal consistency and good test-retest and inter-rater reliability.

2.5. Synthesis

A synthesis of the studies was carried out focusing on study design, sample characteristics, therapeutic modality, length of the intervention, service setting and

measure of dissociation used. A list of all abbreviations used in the Results section is detailed in Appendix 2. The outcomes were evaluated based on the statistical and clinical significance. Effect sizes were calculated where sufficient data was provided in the paper. The effect size was calculated by dividing the difference in mean values between pre- and post-therapy by the standard deviation of the pre-therapy assessment (Cohen, 1988).

Figure 1. Flow-chart of screening process



3. Results

The electronic search and hand search of previous reviews identified 268 records in total out of which 56 were duplicates. The screening process is detailed in Fig. 1. Following screening of titles and abstracts, 62 papers were closely evaluated with reference to the inclusion and exclusion criteria. This review discusses the findings of 20 articles, which met the inclusion criteria. The final sample of papers was composed of six RCTs (Feigenbaum et al., 2012; Giesen-Bloo et al., 2006; Gregory et al., 2008; Koons et al., 2001; Nadort et al., 2009; Simpson, Yen, & Costello, 2004), one non-randomized control trial (Bohus et al., 2004) and seven prospective studies (Bohus et al., 2000; Digre & Reece, 2009; Harned et al., 2008; Kellett, Bennett, Ryle, & Thake, 2013; Low, Jones, Duggan, Power, & MacLeod, 2001; Sachse, Keville, & Feigenbaum, 2011; Yen, Johnson, Costello, & Simpson, 2009).

Some of the papers included assessed overlapping samples. Three studies exploring the efficacy of DDP (Goldman & Gregory, 2009, 2010; Gregory, DeLucia-Deranja, & Mogle, 2010) used a subsample that was assessed in an RCT reported by Gregory et al. (2008). The DBT sample that was recruited by (Bohus et al., 2004) was also assessed by Kleindienst et al. (2008) and constitutes a sub-sample of Kleindienst et al. (2011). In addition, the analyses of two papers included (Harned & Jackson, 2010; Harned, Korslund, Foa, & Linehan, 2012) was drawn from a larger RCT (Linehan et al., 2006).

3.1. Overall study quality

The overall quality of the included studies was satisfactory. The ratings of the studies are shown in Table 3. All studies scored highly on the reporting quality scale (i.e. 8-10). Two studies reported probability values only (Giesen-Bloo et al., 2006; Nadort et al., 2009). However external validity and internal reliability were often questionable. None of the studies discussed potential adverse events that might be caused by the intervention. Half of the studies measured the therapists' adherence to the model (Giesen-Bloo et al., 2006; Goldman & Gregory, 2009, 2010; Gregory et al., 2008, 2010; Harned & Jackson, 2010; Harned et al., 2012; Kellett, Bennett, Ryle, & Thake, 2013; Koons et al., 2001; Nadort et al., 2009). Only two studies included a measure of clinically reliable change of dissociation (Koons et al., 2001; Sachse et al., 2011).

The external validity score varied between studies. Most studies were carried out in specialized services and university hospitals that may not be representative of the community services offered to the source population. The sample of all studies was highly skewed towards female participants. The common reasons for excluding participants were psychotic or bi-polar disorder diagnosis, current substance abuse, learning disability or other neuropsychological conditions. These conditions, especially substance misuse, are highly common in this client group (McGlashan et al., 2000). All therapies were administered by highly experienced and qualified professionals, who received regular supervision. In all the studies the therapists followed a specific therapeutic model that was either circumscribed or manualized.

Table 3. Quality rating of studies included in review

Study	Reporting (total=11)	External validity (total=11)	Internal reliability (total=5)	Internal reliability selection bias (total=5)	Total quality score (total=32)
Bohus et al. (2000)	8	3	3	0	14
Bohus et al. (2004)	10	5	4	1	20
Digre & Reece (2009)	8	6	3	1	18
Feigenbaum et al. (2011)	10	7	4	4	25
Giesen-Bloo et al. (2006)	9	9	4	5	27
Goldman & Gregory (2009)	9	8	4	0	21
Goldman & Gregory (2010)	9	8	3	0	20
Gregory et al. (2008)	9	9	3	4	25
Gregory et al. (2010)	10	9	4	3	26
Harned et al. (2010)	9	5	3	5	22
Harned et al. (2012)	9	5	3	2	19
Kellet et al. (2013)	8	7	3	0	18
Kleindienst et al. (2008)	10	1	3	3	17
Kleindienst et al. (2011)	10	4	4	2	20
Koons et al. (2001)	10	6	4	4	24
Low et al. (2001)	9	3	4	0	16
Nadrot et al. (2009)	9	10	4	5	28
Sachse et al. (2011)	9	8	3	1	21
Simpson (2004)	10	5	4	4	23
Yen et al. (2009)	9	4	3	0	16
Mean score (SD)	9.2 (0.69)	6.1 (2.42)	3.5 (0.51)	2.2 (1.93)	21 (3.94)

Note: Studies were evaluated using the rating checklist constructed by Cahill, Barkham and Stiles (2010).

Internal reliability of dissociation measures was relatively high across all studies. Most studies used a version of the Dissociative Experience Scale (e.g. DES, DES-II, DES-T), which is a highly reliable and valid measure (Bernstein, & Putnam, 1986;

Waller, Putnam, & Carlson, 1996). Two studies assessed dissociation using the BPDSI-IV dissociative and paranoid ideation subscale (Giesen-Bloo et al., 2006; Nadort et al., 2009). All studies applied appropriate statistical analyses. Patients' adherence to the treatment was not monitored directly in any of the studies. However, the measurement of clinical outcomes and the report of dropout rates can be considered an indirect measure of compliance.

The risk of selection bias and confounding factors across studies was high, as most studies applied uncontrolled designs. Only six studies included a randomized assignment method (Feigenbaum et al., 2012; Giesen-Bloo et al., 2006; Gregory et al., 2008; Koons et al., 2001; Nadort et al., 2009; Simpson et al., 2004). Attrition rates varied between studies but were relatively high. This not only weakens the power of the study, but also hinders the representativeness of the sample. Most observational studies included only treatment completers in the analysis, which does not control for the effect of dropouts on the findings. Some studies applied intention-to-treat analysis. Only a couple of studies reported power analyses and most studies lacked sufficient power to detect a meaningful effect.

3.2. Efficacy Studies

Nine papers were identified that reported the findings of six RCTs. Table 4 summarizes the findings of these studies. Two studies assessed the effectiveness of DBT (Feigenbaum et al., 2012; Koons et al., 2001) and one study looked at the combined effect of DBT with fluoxetine (Simpson et al., 2004). SFT for BPD was assessed by two studies (Giesen-Bloo et al., 2006; Nadort et al., 2009). One study explored the benefits

of DDP with patients with co-morbid BPD and alcohol misuse (Goldman & Gregory, 2009; Gregory et al., 2008). Two of the studies included were not covered in previous reviews (Binks et al., 2006; Stoffers et al., 2012).

Three studies compared the treatment group to treatment as usual (TAU). Simpson et al. (2013) compared DBT with fluoxetine to DBT with placebo, which limits the conclusion that can be drawn about the effectiveness of the psychological intervention. However this study was thought to be relevant, as the majority of BPD patients receive therapy while also being prescribed medication (Lieb, Völlm, Rücker, Timmer & Stoffers, 2010). Accordingly all studies allowed concurrent psychopharmacological treatment. Giesen-Bloo et al. (2006) assessed the outcomes of outpatient SFT versus TFP. The benefit of adding therapist telephone assistance (TTA) to SFT was compared to a course of SFT with no TTA in Nadort et al. (2009).

Table 4. Summary of RCTs assessing outcome of dissociation in BPD

Study	Design	Sample size for analysis	Presenting problem	Intervention	Measure of dissociation	Assessment	Length of intervention	Data analysis	Outcome	Effect size
Feigenbaum et al. (2012)	RCT	41 (30F)	Cluster B PD (93% BPD)	Outpatient DBT vs. TAU	DES-II	Pre-Tx 6m Post-Tx (12m)	12m	ITT	DBT did not reduce dissociation more than TAU Dissociation did not improve over time in both groups	d_{DBT}=.07 d_{TAU}<.01
Giesen-Bloo et al. (2006)	RCT	86 (80F)	BPD	Outpatient SFT vs. outpatient TFP	BPDSI-IV subscales	Pre-Tx Every 3m for 3 years	3yr	ITT	SFT improved more than TFP on: Identity disturbance (p=.02), dissociative and paranoid ideation (p=0.02) Majority of ppt. remained in therapy for more than 3yrs	

Goldman & Gregory (2009)	Obs[a]	10 (9F)	BPD+ Alcohol use disorder	Outpatient DDP	DES	Pre-Tx 3m 6m 9m 12m	12	TC	N.S. positive correlation between DDP adherence and improvement in dissociation	r=.51
Goldman & Gregory (2010)	Obs[a]	10 (9F)	BPD + Alcohol use disorder	Outpatient DDP	DES	Pre-Tx 3m 6m 9m 12m	12	TC	Positive correlation between association technique and improvement in dissociation N.S. correlation between working alliance and dissociation	r=0.79** r= 0.30
Gregory et al. (2008)	RCT	30 (24F)	BPD+ Alcohol use disorder	Outpatient DDP vs. TAU	DES	Pre-Tx 3m 6m 9m 12m	12m	ITT	DDP reduced dissociation N.S. change in TAU scores N.S. Time X Group effect	d_{DDP}=.21* d_{TAU}=.18 $d_{TimeXGroup}$=.29
Gregory et al. (2008)	RCT	30 (24F)	BPD+ Alcohol use disorder	Outpatient DDP vs. TAU	DES	Pre-Tx 3m 6m 9m 12m	12m	ITT	DDP reduced dissociation N.S. change in TAU scores N.S. Time X Group effect	D_{DDP}=.21* d_{TAU}=.18 $d_{TimeXGroup}$=.29

Gregory et al. (2010)	Obs	24 (17F)[b]	BPD + alcohol use disorder	Outpatient DDP vs. OCC	DES	Post-Tx (12m) 30m f/u	12m	Modified ITT[c]	N.S. change in dissociation in DDP treatment completers (n=8) N.S. change in dissociation in OCC N.S. Time X Group effect	d_{DDP} =.69 d_{OCC}=.47 $d_{TimeXGroup}$=.47
Koons et al. (2001)	RCT	20F	Army veterans with BPD	DBT vs. TAU	DES	3m Post-tx (6m)	6m	TC	DBT reduced dissociation N.S. change in TAU N.S. Time X Group effect 80% of DBT and 40% of TAU met criteria for CSI	d_{DBT}=0.66** d_{TAU}=0.22 $d_{TimeXGroup}$=0.49
Nadort et al. (2009)	RCT	62 (60F)	BPD	SFT vs. SFT+ Therapist telephone assistance (TTA)	BPDSI-IV	Pre-Tx 6m 12m Post-Tx (18m)	18m	ITT	Patients in both groups improved significantly on BPDSI –IV dissociative and paranoid scale (p=0.002) and met fewer criteria for BPD (including identity disturbance)	

									Significant Time X Group effect	$d_{TimeXGroup}$=.44*
Simpson et al. (2004)	RCT	25F	BPD	DBT + Fluoxetine vs. DBT+ Placebo	DES	Pre-Tx week 10	12w	TC	DBT+ Placebo decreased dissociation	d_{DBT+P}= .75**
									No added value for Flouxetine	d_{DBT+F}= .01

Note: [a] DDP sample from Gregory et al. (2008); [b] naturalistic follow up of Gregory et al. (2008) sample; [c] only included ppt. that attended first 6 months of therapy; [d] Giesen-Bloo et al. (2006) sample; F= female; BPD=borderline personality disorder; PD= personality disorder; DBT= dialectical behavioural therapy; TAU= treatment as usual; DDP= dynamic deconstructive therapy; OCC= optimized community care; SFT= schema focused therapy; ITT= intention to treat; TC=treatment completers; CSI= clinically significant improvement; DES= Dissociative Experience Scale; DES-II= Dissociative Experiences Scale II; BPDSI-IV= Borderline Personality Severity Index-IV, measures dissociation and paranoid ideation.

3.2.1. DBT

All DBT studies included individual sessions and weekly skills training group sessions. Simpson et al. (2013) was the only study that assessed a hospital based treatment program, as the rest of the studies included were conducted in community-based services.

The findings of the DBT studies were mixed. Feigenbaum et al. (2011) did not find a statistically significant difference between participants receiving DBT and those in the TAU condition. The study concluded that both DBT and TAU could be effective in reducing risk and distress in this population group. However DBT was found to be more effective than TAU for women veterans with BPD (Koons et al., 2001). Although no interaction effect was found, the DBT group improved on dissociation ($F(1,18)=13$, $p<.01$) with a large effect size ($d=1.13$). This was not replicated in the TAU group. 80% of DBT patients and 40% of TAU met criteria for clinically significant improvement. Both studies reported strong methodological qualities (i.e. 26 and 25 respectively). The conflicting results might be due to variations in the sample characteristics. The mean pre-therapy DES score of participants in the DBT condition of this study was lower (Mean= 22.3, SD=15.2) than that of participants in Feigenbaum et al. (2011) treatment group (Mean=30.26, SD=22.16). This suggests that patients in the Koons et al. (2001) treatment group had less severe dissociative symptoms at the start of therapy, which might have allowed for greater improvement in dissociative symptoms following therapy.

A course of combined fluoxetine and DBT was not found to be more effective than DBT and placebo group (Simpson et al., 2004). The placebo group reported improvement across all outcome measures, including DES ($t(10)=3.42$, $p<.007$), which was not replicated in the fluoxetine condition. A main effect for treatment condition was also significant ($F(1,18)=4.83$, $p<.04$). The authors concluded that fluoxetine did not have an added benefit to the course of DBT. This supports the findings from Koons' et al. (2001) study. However, it is hard to determine from this study the effect of DBT for BPD, as this was not properly assessed.

3.2.2. DDP

The effectiveness of dynamic deconstructive psychotherapy (DDP) in treating co-morbid alcohol misuse and BPD was explored in a series of studies conducted by Gregory et al. (2008; Gregory, DeLucia-Deranja & Mogle, 2010) with relatively strong methodology (i.e. 25-26). DDP is a manual based psychotherapy that was developed for treating co-occurring BPD and substance misuse disorders or antisocial personality disorder (Woody, McLellan, Luborsky, & O'Brien, 1985). The study compared outcomes of a one-year course of DDP to TAU. Participants receiving DDP improved on a range of outcome measures including dissociation ($t(28)=-2.46$, $p<.05$; $d=.21$; Gregory et al., 2008). Although participants in the TAU condition had more therapeutic contact, they did not report a similar improvement. The study did not find an interaction effect of group over time. An 18 months naturalistic follow-up study (Gregory, DeLucia-Deranja, & Mogle, 2010), found a medium effect size for the change in DES scores between pre-therapy and 30 months follow up ($d=.69$), which was not statistically

significant. However, DES scores in the TAU group remained largely the same at 30 months compared to pre-treatment.

3.2.3. SFT and TFP

SFT has been found to be effective in reducing dissociation as reported by two RCTs (Giesen-Bloo et al., 2006; Nadort et al., 2009). Both of these studies socred the highest on rating checklist (Cahill, Barkham, & Stiles, 2010) out of the total of studies evaluated, suggesting of strong validity of the results. Giesen-Bloo et al. (2006) reported of a superiority of SFT over TFP in reducing identity disturbance (p=.02) and dissociative and paranoid ideation (p=.02). However, both studies only reported the p value with no mentioning of the average scores and standard deviation. Therefore the effect size could not be calculated. Nadort et al. (2009) did not report the added benefit of TTA to a course of SFT in reducing dissociation.

3.2.4. Summary of RCTs findings

Overall DBT and DDP were not found to be superior to TAU. SFT was found to be more effective than TFP in two studies. All studies reported improvement in symptoms of participants in the therapy group, which was not statistically significant when compared to the control group. Prescribing fluoxetine along with a course of DBT was not found to be more effective than DBT and placebo.

3.3. Prospective Studies

The search identified seven prospective studies (Bohus et al., 2000; Digre & Reece, 2009; Harned et al., 2008; Kellett et al., 2013; Kleindienst et al., 2008, 2011;

Low et al., 2001; Sachse, Keville, & Feigenbaum, 2011; Yen et al., 2009) and one controlled trial, which compared DBT to waiting list (Bohus et al., 2004). A detailed account of these studies and their findings can be found in Table 5. DBT based interventions were the most studied, with nine studies identified. One study reported outcomes of cognitive analytical therapy (CAT; Kellett et al., 2013) trial and one mindfulness based cognitive therapy-adapted (MBCT-a; Sachse et al., 2011) study was included. The length of the interventions varied notably, ranging from 5-day partial hospitalization program to one year of treatment. Five studies included a follow-up assessment, which ranged from three to 21 months.

The sample size of the studies ranged from ten to 77 participants. Some variations in inclusion criteria were found. Only three studies included a minority of male participants (Digre & Reece, 2009; Kellett et al., 2013; Sachse et al., 2011). Five studies recruited BPD patients presenting with self-harming behaviour (Bohus et al., 2000; Bohus et al., 2004; Harned et al., 2008; Kleindienst et al., 2011; Low et al., 2001). One study defined a more general inclusion criteria recruiting all PDs, with 96% of the sample diagnosed with BPD (Digre & Reece, 2009).

Six studies assessed DBT based interventions for inpatients with BPD (Bohus et al., 2000; Bohus et al., 2004; Kleindienst et al., 2008, 2011; Low et al., 2001; Yen et al., 2009) and one study was carried out in a residential settings (Digre & Reece, 2009). All studies offered individual weekly therapy sessions except for Sachse et al. (2011), which explored the efficacy of MBCT-a. However 81.8% of their sample was in individual therapy while attending the group. All DBT based interventions offered skills training groups and only one study reported the use of telephone consultations (Harned et al.,

2012; Harned & Jackson, 2010) . Digre and Reece (2009) applied the most intensive intervention with three individual weekly sessions carried out in a residential setting. One study (Kellett et al., 2013), assessing the implementation of CAT, did not offer group therapy and offered up to four follow up sessions, which is in line with the CAT model.

Table 5. Summary of non-RCTs assessing outcome of dissociation

Study	Design	Sample size and females in analysis	Presenting problem	Intervention	Length of intervention	Measure	Assessment	Data analysis	Outcome of dissociation	Effect size
Bohus et al. (2000)	Obs	24F	BPD + DSH	Inpatient DBT	3m	DES	Pre-Tx 1m f/u	TC	Improvement in dissociation severity	d=1.04**
Bohus et al. (2004)	CT	50F	BPD + DSH	Inpatient DBT vs. WL	3m	DES	Pre-Tx 1m f/u	TC	DBT did not improve more than WL ppt. DBT ppt. improved in dissociation N.S. change in WL ppt. Pre-tx dissociation correlated with greater improvement in dissociation at outcome	f^2= .04 d=.53** d=.14 β= .285
Digre & Reece (2009)	Obs	77 (74F)	PD (96% BPD)	Integrative residential intensive programme[4]	$\bar{X}$ = 23.81 wks (SD=13.7)	DES	Pre-Tx Post –Tx	TC	Improvement in dissociation Ppt. in the severely disturbed internalizing cluster showed highest levels of dissociation	η^2= .41**

										$\beta = -.51^{*}$
Harned et al. (2010)	Obs	51F[3]	BPD + recent and/or imminent suicidal behaviour or serious DSH (51 % met criteria for PTSD)	DBT	1yr	DES-T	Pre-Tx 4 months 8 months Post-Tx (12m)	ITT	Improvement in dissociation in BPD+PTSD group N.S. improvement in dissociation in BPD ppt. N.S. association between pre-tx dissociation and reduction in self-harm in BPD+PTSD sample	r=.03
Harned et al. (2012)	Obs	13F[3]	BPD + PTSD + recent and/or imminent suicidal behaviour or serious DSH	DBT and PE	12m	DES-T	6m Post-Tx 3m f/u	ITT DBT PE completers (n=7)	Improvement in dissociation Improvement in dissociation	$d_{pre\text{-}post} = 1.0^{*}$ $d_{Pre\text{-}FU} = 1.4^{*}$ $d_{pre\text{-}post} = 1.2^{*}$ $d_{Pre\text{-}FU} = 1.1^{*}$
Kellet, et al. (2013)	Obs	17 (14F)	BPD	CAT	24 weekly sessions+ 4 f/u within 6months	DES	Pre-Tx Post- Tx F/u (up to 6m)	TC	Improvement in dissociation Improvement maintained at follow up	d=.15**
Kleindie-nst et al. (2008)	Obs	31F[1]	BPD + DSH	Inpatient DBT	3m	DES	Pre-Tx 1m f/u 12m f/u 24m f/u	TC	Improvement in dissociation was maintained for 21m	$d_{T0\text{-}T3} = .72^{**}$
Kleindie-nst et al. (2011)	Obs	57F [2]		Inpatient DBT	3m	DES	Pre-Tx 1m f/u	TC	Pre-Tx dissociation correlated with improvement in dissociation	r=.43*

									Pre-Tx dissociation correlated with poor improvement in general psychiatric symptoms	β=-.017**
Low, et al. (2001)	Obs	10F	BPD + DSH	Inpatient DBT	12 m	DES	Pre-Tx 4m 8m Post-Tx 6 m f/u	TC	Improvement in dissociation within 4 months of therapy	d=1.4**
									Dissociation severity remained lower at f/u compared to pre-tx	d_{Pre-FU} =1.06*
Sachse et al. (2011)	Obs	22 (19F)	BPD	MBCT-a	1 individual orientation session + 8 weekly 2.5hr group sessions	DES-II SDQ-20	Pre-Tx 1m f/u	Whole sample analysis	N.S. improvement in cognitive or physical dissociation	
									Treatment improvers reported of reduction in physical dissociation, RCI=5	
Yen et al. (2009)	Obs	47F	BPD	Partial hospitalization DBT	5 days	DES	Pre-discharge 3m f/u	TC	Improvement in experiential avoidance	d=.19*
									Improvement in dissociation between discharge and f/u	d= .35**
									Dissociation at discharge predicted dissociation at f/u	β=.5**
									Endorsement of BPD emptiness criteria predicted improvement in dissociation	β=.34**

Note: [a] assessed Bohus et al. (2004) clinical sample; [b] included Bohus et al. (2004) clinical sample with 26 new ppt.; [c] assessed subsample from Linehan et al. (2006); [d] combined DBT and psychodynamic techniques; Obs=observational study; CT= controlled trial; BPD=borderline personality disorder; DSH=deliberate self-harm; PTSD= post-traumatic stress disorder; DBT= dialectical behavioural therapy; WL=waiting list; PE= prolonged exposure; CAT=cognitive analytic therapy; MBCT-a= mindfulness based cognitive therapy- adapted; DES=Dissociative Experience Scale; DES-T=DES-Taxon; SDQ- Somatoform Dissociation Questionnaire; AAQ= Acceptance and Action Questionnaire; RCI= reliability of change index; ITT=intention to treat; TC=treatment completers * $p<.05$; ** $p<.001$

3.3.1. DBT

DBT was not found to be superior to WL in reducing dissociative experiences (Bohus et al., 2004). The authors explain this finding due to a large variance in the sample (i.e. SD= 13.7-15). When controlling for the effect of medication on treatment outcome, DES scores did not change significantly after the course of treatment. This supports the findings reported by Feigenbaum et al. (2012).

All non-controlled DBT studies apart from one (Harned & Jackson, 2010) reported a significant improvement of dissociative symptoms at the end of therapy. Low et al. (2001) showed a decline in dissociative experiences within four months of starting therapy and a consistent trend of improvement throughout the intervention ($d=1.4$, $p<.01$). This was not replicated in all measures that showed significant reduction at the 4months assessment point. The different ouctome reported by Harned and Jackson (2010) might be due to sample charactersitics, as this study recruited participants with comorbid BPD and PTSD. Participants in this study were likely to present with more severe dissociation. Furthermore the study evaluated the decrease in number of participants were above the cut off score for severe dissociation. Therefore it might be that it missed more subtle improvements in dissociation that were picked up by other studies (Foa, Hembree, & Rosenbaum, 2007).

Four studies conducted follow up assessments ranging from three months to 21 months following discharge from therapy (Harned et al., 2012; Kleindienst et al., 2008; Low et al., 2001; Yen et al., 2009). They all report lower levels of dissociation at follow up compared to baseline with moderate to large effect sizes. None of the studies

controlled for participants engagement in other therapies during the follow-up phase. Kleindienst et al. (2008) reported that 76% of participants continued with some form of behavioural therapy after completing the DBT program. This along with the lack of a control group makes it harder to determine whether the reduction in DES scores can be attributed to the specific therapeutic model assessed.

Harned et al. (2010; 2012) assessed the effectiveness of DBT for women with co-occuring BPD and PTSD. The prevalence of severe dissociation in participants with co-morbid BPD and PTSD reduced following one year of treatment ($\beta = -.51$, $p < .05$). However, participants with BPD without PTSD did not show a similar improvement. DES scores did not differ significantly at the end of treatment between participants that met inclusion criteria for PTSD treatment and those that did not. These findings suggest that standard DBT can be effective for patients presenting with co-morbid BPD and PTSD, which are often seen in services (McGlashan et al., 2000; Zanarini et al., 1998). A later study by Harned et al. (2012) explored the value of adding prolonged exposure to standard DBT protocol. They report a decrease in dissociation symptoms at post-therapy and follow up with a large effect size ($d_{pre\text{-}post}=1.0$, $d_{pre\text{-}FU}=1.4$). However it should be noted that these findings are based on a very small sample (n=13).

3.3.2. CAT

One study assessed the efficacy of CAT in reducing dissociation in a female cohort presenting with BPD (Kellet, et al., 2013). The intervention consisted of 24 weekly sessions and up to four follow-up sessions within six months from finishing therapy. There was an increase in dissociative symptoms between screening and start of

therapy, with symptoms of dissociation subsequently reducing over the course of therapy (d=.15, p<.01). It should also be noted that the study had considerably high compliance rates, with only 10.53% of participants not completing the 24 sessions and follow-up. However their sample scored below the BPD mean for dissociation throughout the therapy.

3.3.3. MBCT-a

The effectiveness of a group based MBCT was assessed in one pilot study (Sachse, Keville & Feigenbaum, 2011). The intervention consisted of 2.5-hour group sessions for 8 weeks. The study did not find a statistically significant reduction in DES-II scores (Carlson & Putnam, 1996) and Somatoform Dissociation Questionnaire (SDQ-20; Nijenhuis, Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1996), which measures symptoms of physical dissociation. Post-hoc reliability change analyses of treatment improvers showed significant change of SDQ-20 (RCI=5), as well as significant reduction in experiential avoidance (d=.19, p<.05), which was measured by the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004). However, 82% participants were receiving either CBT or DBT the effect of MBCT on dissociation is unclear.

3.3.4. Summary of prospective studies

DBT was not found to be significantly more effective than spontaneous improvement of participants in the WL group. All observational studies reported an improvement in dissociation following therapy. This outcome was maintained up to 21 months after finishing therapy. A study assessing CAT for BPD showed a reduction in dissociation at

the end of therapy. However, participants undergoing a course of MBCT-a did not report of an improvement in dissociative symptoms.

3.4. Moderators of improvement in dissociation

Potential moderators of outcome of dissociation were explored by five studies (Bohus et al., 2004; Digre & Reece, 2009; Goldman & Gregory, 2009; 2010; Kleindienst et al., 2011; Yen et al., 2009). More severe dissociation at baseline was found to predict greater improvement of dissociation at outcome by two studies (Bohus et al., 2004, β=.285; Yen et al., 2009, β=.5). Endorsement of BPD emptiness criteria correlated with improvement in dissociation during treatment (β=.34, Yen et al., 2009). However, this finding needs to be considered in light of this study's low quality rating score (i.e. 14; Cahill, Barkham, & Stiles, 2010). Digre and Reece (2009) found that patients with higher levels of clinical severity, who presented with a tendency to internalize difficulties, were more likely to experience more severe dissociation. They divided the sample into three sub-groups according to various clinical features (e.g. crisis managing style, clinical severity and frequency of self harm). However, they did not find a statistically significant difference in DES scores at the end of therapy between the three clusters. A further analysis showed that only the 'withdrawn-internalizing' cluster reported improvement in dissociation ($t(11)= 3.38$, $p<.01$) with a large effect size ($d = .98$). However the authors caution that separate analysis of clusters may have lacked sufficient power.

An analysis of the treatment completers of DDP, found that adherence to treatment was correlated with greater improvement of DES scores (Goldman & Gregory,

2009). Although the authors report of a large effect size (r=.51) the effect was not statistically significant, which might be due to the small sample size. A positive correlation was also found between association techniques and dissociation reduction (r=.79, p<.01). Association techniques aim to help the patient build narratives of recent interpersonal situations and recognize the emotions these evoked in them. This findings support the authors' hypothesis that association techniques help the patient link different aspects of their experience and as a result are likely to help counter dissociation. Working alliance was found to have a non-statistically significant effect on improvement in DES with a medium effect size (r=.3; Goldman & Gregory, 2010). However the study did not assess the participants that left the treatment before the end of the first year of treatment. It might be that the participants that completed a year of therapy were more motivated to engage and more likely to find the therapy effective.

3.5. Dissociation as a moderator of therapy outcome

The impact of dissociation on improvement on other outcome measures was assessed in two studies (Kleindienst et al., 2011; Harned et al., 2010). Higher DES scores at pre-therapy were linked to poorer improvement in psychiatric symptomatology (β= -.017; Kleindienst et al., 2011). The correlation remained significant even after controlling for the potentially confounding effects of change in medication (β = –.028 ±.008, p<.01). An explorative analysis found that association between frequency of dissociative experiences and treatment outcome was not specific to any of the DES facets, such as depersonalization and derealization. However the validity of the sub-scores of DES in measuring different aspects of dissociative symptoms is not fully established. Harned et al. (2010) reported of a small and non-significant correlation

between pre-therapy dissociation and reduction in self-harm behaviours in BPD patients with co-morbid PTSD (r=.03).

4. Discussion

4.1. Summary of findings

This review aimed to assess the effectiveness of psychological interventions in reducing dissociation in BPD patients. The limited number of studies found is in line with the reports of previous reviews (Stoffer et al., 2012; Barnicot et al., 2012). Psychotherapy was not found to be superior to treatment as usual in most studies, except for Simpson et al. (2004) who showed that a combination of placebo and DBT was more effective than fluexotine and DBT. Nonetheless most studies showed promising results, reporting small to large effect sizes. Only one study compared different therapeutic modalities, showing that SFT was more effective than TFP in reducing dissociative and paranoid ideation (Giesen-Bloo et al., 2006). This review highlights the need for further research to improve understanding of what helps reduce dissociation in BPD.

As expected the largest evidence base was for DBT. Although it was not found to be more effective than TAU, there is some evidence for improvement that was maintained at follow-up. Standard DBT was also reported to be effective for more complex cases (e.g. BPD+PTSD). DDP showed promising results for countering dissociation in patients presenting with co-occurring DBT and alcohol misuse (Gregory et al., 2008). CAT was also reported to be effective in reducing dissociation (Kellett et al., 2013), unlike MBCT-a, which did not yield improvement in psychological or physical dissociation (Sachse et al., 2011).

Only five studies assessed potential moderators of dissociation improvement. Increased severity of dissociation before therapy was found to predict the most change in dissociation at outcome (Bohus et al., 2004; Yen et al., 2009). Endorsement of BPD emptiness criteria was also reported to correlate with improvement in dissociation following a course of DBT (Yen et al., 2009). However, patterns of coping with distress (i.e. internalizing vs. externalizing) were not found to be statistically significant in predicting outcome of dissociation. The role of dissociation as a moderator of improvement in general psychopathology was measured by two studies (Kleindienst et al., 2011; Harned et al., 2010). More severe dissociation at baseline was found to be linked to poorer general symptomatology at outcome (Kleindienst et al., 2011). Dissociation severity before therapy reliably predicted improvement in self-harm in patients with co-occurring BPD and PTSD (Harned et al., 2010).

4.2. Comparison to findings from previous reviews

This review adds to the existing reviews (Binks et al., 2006; Stoffers et al., 2012) by including prospective studies in addition to RCTs. Including non-RCT studies provided a broader view on the possible effectiveness of psychological therapies, mostly in routine practice. By widening the inclusion criteria more therapy models were covered, such as CAT and MBCT, as well as more inpatient interventions. This review also included two new RCTs, which used DBT (Feigenbaum et al., 2012; Simpson et al., 2004) that were not covered in previous reviews. However, unlike the Stoffer et al. (2012) review this study did not identify MBT trials. MBT is one of the most commonly used interventions with BPD today. It will be interesting for future studies to measure dissociation outcomes in MBT, so this intervention could be compared to other

therapeutic modalities. The findings of this review showed promising results that some psychological therapies could help reduce dissociation in BPD. This supports the conclusion made by Stoffer et al. (2012). Although the findings were mixed, overall the majority of studies showed a positive trend towards improvement in dissociation following a course of therapy. Similar to previous reviews no therapeutic modality was found significantly superior to others. It will be interesting for future reviews compare should be further explored by conducting a meta analysis, which was not in the scope of this review.

The series of studies assessing the impact of therapist adherence and techniques in DDP on change in dissociation added to the previous review published by Barnicot et al. (2012). Association technique was found to positively correlate with improvement in dissociation at the end of therapy (Goldman & Gregory, 2010). Goldman and Gregory (2010) suggest that similar techniques are likely to be applied in other treatment models (e.g. behavioral chain analyses in DBT), which may underlie the improvement in dissociation. Further understanding the active factors in different interventions can help promote more effective treatment for the patient to best fit their needs.

4.3. Implication for clinical work

This review shows that the common psychological interventions available today can be effective in reducing a core symptom of BPD. However the evidence also suggests that dissociation can improve spontaneously. There is very limited evidence for the effectiveness of interventions that are not DBT, especially for dissociation. Therefore, clinicians should be wary when implementing non-DBT interventions to

address dissociation. Patients providing informed consent for therapy must be aware of the limitations of the therapy being offered.

Outpatient as well as inpatient programs can be potentially effective for treating dissociation in this client group. The evidence base for outpatient interventions is larger and more robust than inpatient programs. This suggests that this client group can be treated effectively outside an inpatient hospital setting. The advantage of this is both in allowing the patient to remain in their home environment while also reducing the cost of inpatient admissions.

The majority of the studies identified in this review assessed long-term interventions (i.e. greater than 6 months). NICE guidelines state (2009) states that very brief interventions (i.e. less than 3 months) do not appear to be sufficiently effective for BPD patients. However short-term interventions, which modify standard DBT, also show promising results (Bohus et al., 2004; Simpson et al., 2004; Yen et al., 2009). Low et al. (2001) found that dissociation improved 4 month after commencing a 12 months DBT inpatient program. This is in line with findings of Stoffer et al. (2012), who also suggest that short-term interventions that adapt standard therapy models can be effective. However, the evidence base for such interventions is still very limited and is not satisfyingly robust. Further evaluation of short-term interventions is required. This could be highly beneficial for clinical practice, as it could help increase access to therapy and save resources.

It is not yet clear which elements of therapy have the most impact on dissociation. Bohus et al. (2000) hypothesize that the improvement in dissociation was

related to the use of mindfulness techniques, which encourages patients to increase control of awareness and reduce tendency to judge experiences and events. However, this was not proven in a study reported by Sachse et al. (2011). MBCT-a was not found to be effective in reducing mental and physical dissociation when added to individual therapy. Helping the patient build a coherent narrative of their experiences and the emotional impact these may have had for them can help decrease dissociative experiences (Goldman & Gregory, 2010). However the literature on effective therapeutic techniques for dissociation in BPD is very limited and requires more research before conclusions can be drawn.

4.4. Implication for future research

This review highlights the need for further research on therapy outcome of dissociation. The majority of RCTs published to this date assessing therapy efficacy for BPD did not measure dissociation. Dissociative experiences are highly prevalent in this population group and can be very disturbing for the individual (Skodol et al., 2002). Future studies should strongly consider including a measure of dissociation. Replicating studies using an RCT design is also essential for strengthening the existing evidence base. Comparing active therapy groups, such as Giesen-Bloo et al. (2006), can help establish more directly the benefits of specific therapies. Unlike previous reviews, many of the studies included here reported effect sizes or provided sufficient information for calculating one. However, power analyses were often not reported. Recruiting bigger samples that are more balanced between males and females is also necessary. Using intention to treat analyses can also help boost the validity of the findings and using clinically reliable change index will make the findings more meaningful for clinicians.

Exploring the underlying mechanisms of change in dissociation is also required, as there is very limited research in this area. Currently there is little understanding of what helps improve dissociation in BPD, which is also highlighted in the review by Barnicot et al. (2012). The benefit of reducing dissociative symptoms in improving the general psychopathology and quality of life of the patients has not been assessed. It will be interesting for future studies to investigate the link between dissociation and the individuals' social and occupational functioning.

4.5. Quality of the evidence

Focusing the review on the impact of therapy on dissociation in BPD allowed for a more thorough discussion of this area. Although there is a benefit of a more comprehensive assessment, closely evaluating one outcome of therapy can help identify the specific advantages of certain therapies compared to others. The fact that the majority of the studies used the DES (Bernstein, & Putnam, 1986) to measure dissociation provides some estimate for comparison between the studies. However this is only limited, as this review did not include a meta-analysis of the studies.

The downside of a wider inclusion strategy was that the overall quality of the studies was impeded. Most studies included based their reports on a small sample size and applied multiple tests, which increases the risk of a Type I error. The lack a control group weakened the validity of the findings. One reviewer assessed all the studies and co-rating of papers was not included. Non-English papers were excluded from the review. This perhaps led to missing relevant studies. Furthermore, the design of the studies varied along with the length of the intervention that might have affected the

therapy outcome. Most of the studies did not assess for the impact of concurrent medication. Although one study showed that placebo and DBT improved more than a group receiving Flouxetine and DBT (Simpson et al., 2004). It is also important to bear in mind the potential of an allegiance effect on the outcomes, as it is possible the theoretical orientation of the clinician can impact the outcome.

Most studies did not control for dissociation severity and general psychopathology at the start of therapy. Almost all the studies excluded participants meeting the diagnostic criteria for DD. Although this allowed for a more homogenous group it also limits the appicability of the findings to a group of patients that experience less severe dissociation. None of the studies used comprehensive measures to assess dissociation, but rather used screening tools (e.g. DES, BPDSI-V). Although the DES has sound psychometric properties, it does not assess all aspect of pathological dissociation and it does not diagnose dissociative disorder (Dell, 2006a). Only two studies used the DES-Taxon (DES-T; Harned, Jackson, Comotois & Linehan, 2010; Harned, Korslund, Foa, & Linehan, 2012) and one used the Somatoform Dissociation Questionnaire (SDQ-2; Sachse, Keville & Feigenbaum, 2011), which are considered more rigorous measures of dissociation (Korzekwa, Dell, Links, Thabane & Fougere, 2009). In order to improve understanding of change in dissociation future studies might consider using more comprehensive measures of dissociation, such as the Structured Clinical Interview for DSM–IV Dissociative Disorders–Revised (SCID-D-R; Steinberg, 1994) and the Multidimensional Inventory of Dissociation (MID; Dell, 2006b). These tools assess a wider spectrum of dissociative symptoms in DDs, post-traumatic stress disorder (PTSD) and BPD.

4.6. Conclusions

This review emphasizes the lack of a sufficient evidence-base for the efficacy of psychological interventions for BPD in reducing dissociation. Although there is currently promising reports of improvements in dissociation following a course of psychological therapy, there is still a need for additional and more robust evidence. There is some evidence to suggest that the outcome of dissociation is moderated by several factors that rely both on patient characteristics and therapy features (e.g. severity of dissociation at baseline, association techniques). More detailed assessments of the impact of therapy and patient related variables on improvement in dissociation could help unravel the mechanisms underlying change in dissociative symptoms. Dissociation is commonly reported by BPD patients and can be highly disturbing for the individual. Therefore further understanding of treatment for this phenomenon is strongly recommended.

References

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing.

Barnicot, K., Katsakou, C., Bhatti, N., Savill, M., Fearns, N., & Priebe, S. (2012). Factors predicting the outcome of psychotherapy for borderline personality disorder: a systematic review. *Clinical Psychology Review*, 32, 400–12.

Barnow, S., Arens, E. a, Sieswerda, S., Dinu-Biringer, R., Spitzer, C., & Lang, S. (2010). Borderline personality disorder and psychosis: a review. *Psychiatry Reports*, 12, 186–95.

Barnow, S., Limberg, A., Stopsack, M., Spitzer, C., Grabe, H. J., Freyberger, H. J., & Hamm, A. (2011). Dissociation and emotion regulation in borderline personality disorder. *Psychological Medicine*, 42, 783–94.

Bateman, A., & Fonagy, P. (1999). Effectiveness of partial hospitalization in the treatment of borderline personality disorder: a randomized controlled trial. *American Journal of Psychiatry*, 156,1563–9.

Bateman, A., & Fonagy, P. (2009). Randomized controlled trial of outpatient mentalization-based treatment versus structured clinical management for borderline personality disorder. *American Journal of Psychiatry*, 166, 1355–64.

Bellino, S., Rinaldi, C., & Bogetto, F. (2010). Adaptation of interpersonal psychotherapy to borderline personality disorder: A comparison of combined therapy and single

pharmacotherapy. *Canadian Journal of Psychiatry (Revue Canadienne de Psychiatrie)*, 55, 74–81.

Bellino, S., Zizza, M., Rinaldi, C., & Bogetto, F. (2006). Combined treatment of major depression in patients with borderline personality disorder: A comparison with pharmacotherapy. *Canadian Journal of Psychiatry (Revue Canadienne de Psychiatrie*), 51,453–60.

Bellino, S., Zizza, M., Rinaldi, C., & Bogetto, F. (2007). Combined therapy of major depression with concomitant borderline personality disorder: Comparison of interpersonal and cognitive psychotherapy. *Canadian Journal of Psychiatry (Revue Canadienne de Psychiatrie)*, 52, 718–25.

Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, 174, 727–735.

Binks C., Fenton, M., McCarthy, L., Lee, T., Adams, C. E., & Duggan, C. (2006) Psychological therapies for people with borderline personality disorder. *Cochrane Database of Systematic Reviews* 2006, Issue 1. Art. No.: CD005652

Blum, N., St John, D., Pfohl, B., Stuart, S., McCormick, B., Allen, J., … & Black, D. (2008). Systems training for emotional predictability and problem solving (STEPPS) for outpatients with borderline personality disorder: a randomized controlled trial and 1-year follow-up. *American Journal of Psychiatry*, 165, 468–78.

Bohus, M., Haaf, B., Simms, T., Limberger, M. F., Schmahl, C., Unckel, C., … Linehan, M. M. (2004). Effectiveness of inpatient dialectical behavioral therapy for

borderline personality disorder: a controlled trial. *Behaviour Research and Therapy*, *42*, 487–99.

Bohus, M., Haaf, B., Stiglmayr, C., Pohl, U., Böhme, R., & Linehan, M. (2000). Evaluation of inpatient dialectical-behavioral therapy for borderline personality disorder--a prospective study. *Behaviour Research and Therapy*, *38*, 875–87.

Bos, E. H., Van Wel, E., Bas, A. M. T., & Verbraak, M. J. P. (2010). A randomized controlled trial of a Dutch version of systems training for emotional predictability and problem solving for borderline personality disorder. *Journal of Nervous and Mental Disease*, 198, 299–304.

Cahill, J., Barkham, M., & Stiles, W. B. (2010). Systematic review of practice- based research on psychological therapies in routine clinic settings. *British Journal of Clinical Psychology*, 49, 421-453.

Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation: Progress in the Dissociative Disorders*, 6, 16–27.

Carter, G. L.,Willcox, C. H., Lewin, T. J., Conrad, A. M., & Bendit, N. (2010). Hunter DBT project: randomized controlled trial of dialectical behaviour therapy in women with borderline personality disorder. *Australian and New Zealand Journal of Psychiatry*, 44, 162–73.

Chu, J. A. (1998). *Rebuilding shattered lives: The responsible treatment of complex post-traumatic and dissociative disorders*. New York, NY: Wiley.

Clarkin, J. F., Levy, K. N., Lenzenweger, M. F., & Kernberg, O. F. (2007). Evaluating three treatments for borderline personality disorder: A multiwave study. *American Journal of Psychiatry*, 164, 922–8.

Cohen J. (1988). *Statistical Power Analysis in the Behavioural Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Conklin, C. Z., & Westen, D. (2005). Borderline personality disorder in clinical practice. *American Journal of Psychiatry*, 162, 867–875.

Cottraux, J., Note, I. D., Boutitie, F.,Milliery, M., Genouihlac, V., Yao, S . N., … & Gueyffier, F. (2009). Cognitive therapy versus rogerian supportive therapy in borderline personality disorder. *Psychotherapy and Psychosomatics*, 78, 307–16.

Davidson, K., Norrie, J., Tyrer, P., Gumley, A., Tata, P., Murray, H., & Palmer, S. (2006). The effectiveness of cognitive behavior therapy for borderline personality disorder: results from the personality disorder study of cognitive therapy (BOSCOT) trial. *Journal of Personality Disorders*, 20, 450–65.

Dell, P. F. (2006a). A new model of dissociative identity disorder. *Psychiatric Clinics of North America*, 29, 1–26.

Dell, P. F. (2006b). Multidimensional Inventory of Dissociation (MID). A comprehensive measure of pathological dissociation. *Journal of Trauma & Dissociation*, 7(2), 77–106.

Digre, E., & Reece, J. (2009). Treatment response in subtypes of borderline personality disorder. *Personality and Mental Health*, 3, 56–67.

Doering, S., Hörz, S., Rentrop, M., Fischer-Kern, M., Schuster, P., Benecke, C., … & Buchheim, P.(2010). Transference-focused psychotherapy vs. treatment by community psychotherapists for borderline personality disorder: Randomised controlled trial. *British Journal of Psychiatry*, 196, 389–95.

Downs, S. H., & Black, N. (1998). The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. *Journal of Epidemiological Community Health*, 52, 377–384.

Farrell, J. M., Shaw, I. A., Webber, & M. A. (2009). A schema-focused approach to group psychotherapy for outpatients with borderline personality disorder: A randomized controlled trial. *Journal of Behavior Therapy and Experimental Psychiatry*, 40, 317–28.

Feigenbaum, J. D., Fonagy, P., Pilling, S., Jones, A., Wildgoose, A., & Bebbington, P. E. (2012). A real-world study of the effectiveness of DBT in the UK National Health Service. *The British Journal of Clinical Psychology / the British Psychological Society*, 51, 121–41.

Giesen-Bloo, J., Van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., … & Anrtz, A. (2006). Outpatient psychotherapy for borderline personality disorder. *Archivies of General Psychiatry*, *63*, 649–1008.

Goldman, G. a, & Gregory, R. J. (2009). Preliminary relationships between adherence and outcome in dynamic deconstructive psychotherapy. *Psychotherapy (Chicago, Ill.)*, *46*, 480–5.

Goldman, G. A., & Gregory, R. J. (2010). Relationships between techniques and outcomes for borderline personality disorder. *American Journal of Psychotherapy, 64*, 359–71.

Goodman, M., Weiss, D. S., Mitropoulou, V., New, A., Koenigsberg, H., Silverman, J. M., & Siever, L. (2003). The relationship between pathological dissociation, self-injury and childhood trauma in patients with personality disorders using taxometric analyses. *Journal of Trauma & Dissociation*, 4, 65–88.

Gratz, K. L., & Gunderson, J. G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy*, 37, 25–35.

Gregory, R. J., Chlebowski, S., Kang, D., Remen, A. L., Soderberg, M. G., Stepkovitch, J., & Virk, S. (2008). A controlled trial of psychodynamic psychotherapy for co-occurring borderline personality disorder and alcohol use disorder. *Psychotherapy (Chicago, Ill.)*, 45, 28–41.

Gregory, R. J., DeLucia-Deranja, E., & Mogle, J. A. (2010). Dynamic deconstructive psychotherapy versus optimized community care for borderline personality disorder co-occurring with alcohol use disorders: A 30-month follow-up. *The Journal of Nervous and Mental Disease*, 198, 292–8.

Harned, M., & Jackson, S. (2010). Dialectical behavior therapy as a precursor to PTSD treatment for suicidal and/or self- injuring women with borderline personality disorder. *Journal of Traumatic Stress*, 23, 421–429.

Harned, M. S., Chapman, A. L., Dexter-Mazza, E. T., Murray, A., Comtois, K. a, & Linehan, M. M. (2008). Treating co-occurring Axis I disorders in recurrently suicidal women with borderline personality disorder: a 2-year randomized trial of dialectical behavior therapy versus community treatment by experts. *Journal of Consulting and Clinical Psychology*, 76, 1068–75.

Harned, M. S., Korslund, K. E., Foa, E. B., & Linehan, M. M. (2012). Treating PTSD in suicidal and self-injuring women with borderline personality disorder: development and preliminary evaluation of a Dialectical Behavior Therapy Prolonged Exposure Protocol. *Behaviour Research and Therapy*, 50, 381–6.

Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorelly, J., Toarmino,D., . . . Mccurry, S.M. (2004).Measuring experiential avoidance: A preliminary test of a working model. *Psychological Record*, 54, 553–578.

Jahangard, L., Haghighi, M., Bajoghli, H., Ahmadpanah, M., Ghaleiha, A., Zarrabian, M. K., & Brand, S. (2012). Training emotional intelligence improves both emotional intelligence and depressive symptoms in inpatients with borderline personality disorder and depression. *International journal of psychiatry in clinical practice*, 16, 197-204.

Jørgensen, C. R., Freund, C., Bøye, R., Jordet, H., Andersen, D., & Kjølbye, M. (2013). Outcome of mentalization- based and supportive psychotherapy in patients with borderline personality disorder: A randomized trial. *Acta Psychiatrica Scandinavica*, 127, 305-317.

Kellett, S., Bennett, D., Ryle, T., & Thake, A. (2013). Cognitive analytic therapy for borderline personality disorder: therapist competence and therapeutic effectiveness in routine practice. *Clinical Psychology & Psychotherapy*, 20, 216–25.

Kleindienst, N., Limberger, M. F., Ebner-Priemer, U. W., Keibel-Mauchnik, J., Dyer, A., Berger, M., … Bohus, M. (2011). Dissociation predicts poor response to Dialectial Behavioral Therapy in female patients with Borderline Personality Disorder. *Journal of Personality Disorders*, 25, 432–47.

Kleindienst, N., Limberger, M. F., Schmahl, C., Steil, R., Ebner-Priemer, U. W., & Bohus, M. (2008). Do improvements after inpatient dialectial behavioral therapy persist in the long term? A naturalistic follow-up in patients with borderline personality disorder. *The Journal of Nervous and Mental Disease*, 196, 847–51.

Koons, C. R., Robins, C. J., Lindsey Tweed, J., Lynch, T. R., Gonzalez, A. M., Morse, J. Q., … & Bastian, L. A. (2001). Efficacy of dialectical behavior therapy in women veterans with borderline personality disorder. *Behavior Therapy*, 32, 371–390.

Korzekwa, M. I., Dell, P. F., Links, P. S., Thabane, L., & Fougere, P. (2009). Dissociation in borderline personality disorder: a detailed look. *Journal of Trauma & Dissociation : The Official Journal of the International Society for the Study of Dissociation (ISSD)*, 10, 346–67.

Lieb, K., Völlm, B., Rücker, G., Timmer, A., & Stoffers, J. M. (2010). Pharmacotherapy for borderline personality disorder: Cochrane systematic review of randomised trials. *The British Journal of Psychiatry*, 196, 4-12.

Linehan, M. M., Armstrong, H. E., Suarez, A., Allmon, D., & Heard, H. L. (1991). Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry*, 48, 1060–4.

Linehan, M. M., Comtois, K. A., Murray, A. M., Brown, M. Z., Gallop, R. J., Heard, H. L., … Lindenboim, N. (2006). Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. *Archives of General Psychiatry*, 63, 757–66.

Linehan, M. M., Dimeff, L. A., Reynolds, S. K., Comtois, K. A., Welch, S. S., Heagerty, P., & Kivlahan, D. R. (2002). Dialectical behavior therapy versus comprehensive validation therapy plus 12-step for the treatment of opioid dependent women meeting criteria for borderline personality disorder. *Drug Alcohol Depend*, 67, 13–26.

Linehan, M. M., Tutek, D. A., Heard, H. L., & Armstrong, H. E. (1994). Interpersonal outcome of cognitive behavioral treatment for chronically suicidal borderline patients. *American Journal of Psychiatry,* 151, 1771–6.

Linehan, M. M., Schmidt, H. III, Dimeff, L. A., Craft, J. C., Kanter, J., & Comtois, K. A. (1999). Dialectical behavior therapy for patients with borderline personality disorder and drug-dependence. *The American Journal on Addictions*, 8, 279–292.

Low, G., Jones, D., Duggan, C., Power, M., & MacLeod, A. (2001). the Treatment of Deliberate Self-Harm in Borderline Personality Disorder Using Dialectical Behaviour Therapy: a Pilot Study in a High Security Hospital. *Behavioural and Cognitive Psychotherapy*, 29, 85–92.

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., ... & Stout, R. L. (2000). The Collaborative Longitudinal Personality Disorders Study: Baseline axis I/II and II/II diagnostic co-occurrence. *Acta Psychiatrica Scandinavica*, 102, 256–264.

McMain, S. F., Links, P. S., Gnam, W. H., Guimond, T., Cardish, R. J., Korman, L., Streiner, D. (2009). A randomized trial of dialectical behavior therapy versus general psychiatric management for borderline personality disorder. *American Journal of Psychiatry*, 166, 1365–74.

Michelson, L., June, K., Vives, A., Testa, S., & Marchione, N. (1998). The role of trauma and dissociation in cognitive-behavioral psychotherapy outcome and maintenance for panic disorder with agoraphobia. *Behaviour Research and Therapy*, 36, 1011–50.

Moen, R., Freitag, M., Miller, M., Lee, S., Romine, A., Song, S., ... & Schulz, S. C. (2012). Efficacy of extended-release divalproex combined with "condensed" dialectical behavior therapy for individuals with borderline personality disorder. *Annual Clinical Psychiatry*, 24, 255-60.

Morey, L. C., Lowmaster, S. E., & Hopwood, C. J. (2010). A pilot study of manual-assisted cognitive therapy with a therapeutic assessment augmentation for borderline personality disorder. *Psychiatry Research*, 178, 531–5.

Nadort, M., Arntz, A., Smit, J. H., Giesen-Bloo, J., Eikelenboom, M., Spinhoven, P., … & van Dyck, R. (2009). Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support by the therapist

outside office hours: A randomized trial. *Behaviour Research and Therapy*, 47, 961–73.

National Institute for Health and Care Excellence (2004). *Reviewing and grading the evidence.* London: National Institute for Health and Care Excellence.

National Institute of Clinical Excellence (2009). *Borderline personality disorder. The NICE guideline on treatment and management*. London, UK: The British Psychological Society and The Royal College of Psychiatrists.

Nijenhuis, E. R. S., Spinhoven, P., van Dyck, R., van der Hart, O., & Vanderlinden, J. (1996). The development and psychometric characteristics of the Somatoform Dissociation Question- naire (SDQ-20). *Journal of Nervous and Mental Disease*, 184, 688–694.

Priebe, S., Bhatti, N., Barnicot, K., Bremner, S., Gaglia, A., Katsakou, C., ... & Zinkler, M. (2012). Effectiveness and cost-effectiveness of dialectical behaviour therapy for self-harming patients with personality disorder: a pragmatic randomised controlled trial. *Psychotherapy and psychosomatics*, 81, 356-365.

Ross, C. A. (2007). Borderline Personality Disorder and Dissociation and Dissociation. *Journal of Trauma & Dissociation*, 8, 71–80.

Ross-Gower, J., Waller, G., Tyson, M., & Elliott, P. (1998). Reported sexual abuse and subsequent psychopathology among women attending psychology clinics: The mediating role of dissociation. *British Journal of Clinical Psychology*, 37, 313–326.

Sachse, S., Keville, S., & Feigenbaum, J. (2011). A feasibility study of mindfulness-based cognitive therapy for individuals with borderline personality disorder. *Psychology and Psychotherapy*, 84, 184–200.

Sar, V., Kundakci, T., Kiziltan, E., Yargic, I. L., Tutkun, H., Bakim, B., … & Özdemir, Ö. (2003). The Axis-I dissociative disorder comorbidity of borderline personality disorder among psychiatric outpatients. *Journal of Trauma and Dissociation*, 4, 119–136.

Sar, V., & Ross, C. (2006). Dissociative disorders as a confounding factor in psychiatric research. *Psychiatric Clinics of North America*, 29, 129–144.

Shearer, S. L. (1994). Dissociative phenomena in women with borderline personality disorder. *American Journal of Psychiatry*, 151, 1324–1328.

Simeon, D., Nelson, D., Elias, R., Greenberg, J. & Hollander, E., (2003). Relationship of personality to dissociation and childhood trauma in borderline personality disorder. *CNS Spectrums*, 8, 755–757, 760–762.

Simpson, E., Yen, S., & Costello, E. (2004). Combined dialectical behavior therapy and fluoxetine in the treatment of borderline perosnality disorder. *Journal of Clinical Psychiatry*, 65,379-385.

Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The borderline diagnosis: I. Psychopathology, comorbidity, and personality structure. *Biological Psychiatry*, 51, 936–950.

Soler, J., Pascual, J. C., Tiana, T., Cebrià, A., Barrachina, J., Campins, M. J.,… & Pérez, V. (2009). Dialectical behaviour therapy skills training compared to standard group therapy in borderline personality disorder: A 3-month randomised controlled clinical trial. *Behaviour Research and Therapy*, 47, 353–8.

Spitzer, C., Barnow, S., Freyberger, H. J., & Grabe, H. J. (2006). Recent developments in the theory of dissociation. *World Psychiatry*, 5, 82-85.

Steinberg, M. (1994). *Structured Clinical Interview for DSM-IV Dissociative Disorders, Revised (SCID-D-R)*. Washington, DC: American Psychiatric Press.

Stoffers, J., Völlm, B., Rücker, G., Timmer, A., Huband, N., & Lieb, K. (2012). Psychological therapies for people with borderline personality disorder. *Cochrane Database of Systematic Reviews*, Issue 8. Art. No.: CD005652.

Turner, R. M. (2000). Naturalistic evaluation of dialectical behavior therapy-oriented treatment for borderline personality disorder. *Cognitive and Behavioral Practice*, 7, 413–9.

Van den Bosch, L. M. C., Koeter, M. W. J., Stijnen, T., Verheul, R., & Van den Brink, W. (2005). Sustained efficacy of dialectical behaviour therapy for borderline personality disorder. *Behaviour Research and Therapy*, 43, 1231–41.

Van Den Bosch, L. M. C., Verheul, R., Langeland, W., & Van Den Brink, W. (2003). Trauma, dissociation, and posttraumatic stress disorder in female borderline patients with and without substance abuse problems. *Australian and New Zealand Journal of Psychiatry*, 37, 549–555.

Waller, N., Putnam, F. W., & Carlson, E. B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods*, 1, 300-321.

Weinberg, I., Gunderson, J. G., Hennen, J., & Cutter, Jr C. J. (2006). Manual assisted cognitive treatment for deliberate self- harm in borderline personality disorder patients. *Journal of Personality Disorders,* 20, 482–92.

Woody, G. E., Mclellian, A. T., Luborsky, L., & O'Brien, C. P. (1985). Sociopathy and psychotherapy outcome. *Archives of General Psychiatry*, 42, 1081– 1086.

Yen, S., Johnson, J., Costello, E., & Simpson, E. B. (2009). A 5-day dialectical behavior therapy partial hospital program for women with borderline personality disorder: predictors of outcome from a 3-month follow-up study. *Journal of Psychiatric Practice*, 15, 173–82.

Zanarini, M. C., & Frankenburg, F. R. (2008). A preliminary, randomized trial of psychoeducation for women with borderline personality disorder. *Journal of Personality Disorders,* 22, 284–90.

Zanarini M. C., Frankenburg F. R., Dubo E. D., Sickel A. E., Trikha A., Levin A., & Reynolds V. (1998). Axis I comorbidity of borderline personality disorder. *American Journal of Psychiatry*, 155,1733–1739.

Zanarini, M. C., Ruser, T. F., Frankenburg, F. R., Hennen, J., & Gunderson, J. G. (2000). Risk factors associated with the dissociative experiences of borderline patients. *Journal of Nervous and Mental Disorders*, 188, 26–30.

Part 2: Empirical Paper

Dissociative Symptoms and the Quality of Structural Integration in Borderline Personality Disorder

Abstract

Objectives

This study assessed the relevance of structural integration in the development of borderline personality disorder (BPD). The relationship between structural integration, childhood trauma and psychopathology of BPD was explored in non-psychiatric and BPD samples.

Methods

103 BPD and 90 control participants completed a series of self-report and interview measures, assessing levels of psychopathology, dissociative experiences and childhood trauma. Structural integration was measured using a newly developed measure named the Operationalized Psychodynamic Diagnosis-Structural Questionnaire

Results

Structural integration and childhood trauma correlated with BPD and not with other personality disorders. Psychopathology, dissociation and childhood trauma were associated with the quality of structural integration. The impact of childhood trauma on dissociation was partially mediated by the overall score of structural integration.

Conclusion

BPD participants showed more impaired structural qualities, such as maladaptive regulation capacities and coping strategies, as well as fragile representations of self and others. Structural integration can help explain the complex relationship between history of maltreatment and dissociation in BPD.

4. Introduction

Borderline personality disorder (BPD) is a common and serious mental health problem, characterized by a highly heterogeneous phenotype. According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM-5; American Psychiatric Association [APA], 2013) individuals with BPD present with impaired affect regulation, marked impulsivity, volatile relationships, unstable self-image and transient stress related cognitive disturbances. Five out of nine behavioral features are required for a DSM-5 diagnosis of BPD. Thus, it is possible for two individuals meeting criteria for BPD to have very little overlap in their symptoms. The considerable variability in this client group might imply a flawed diagnostic system or it may reflect a diversity of underlying pathological processes or both (Lenzenweger & Cicchetti, 2005).

The high rates of morbidity and mortality of BPD has brought growing attention to this disorder. Individuals presenting with BPD tend to experience frequent emotional turmoil, chronic feelings of emptiness, impulsive aggression, psychotic-like cognitions, relationship difficulties and chronic suicidal tendencies (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Zanarini et al., 2007). Approximately 1-2% of the general population meet the diagnostic criteria for BPD, with a prevalence of up to 10% amongst psychiatric outpatients and 20% of inpatients (APA, 2013; Torgersen, 2005). This client group is associated with high rates of suicide, deliberate self-harm, functional impairment and extensive use of mental health services (Leichsenring, Leibing, Kruse, New, & Leweke, 2011). BPD patients often meet criteria for co-morbid mood disorders, substances misuse, eating disorders, posttraumatic stress disorder (PTSD) and other personality disorders (McGlashan et al., 2000). Identifying the precursors of the disorder

could help facilitate more effective prevention and treatment plans (Beauchaine & Marsh, 2006; Beauchaine, Neuhaus, Brenner, & Gatzke-Kopp, 2008). Despite some progress in the study of developmental psychopathology of BPD the etiology of the disorder remains unclear (Lenzenweger & Cicchetti, 2005). This study aims to shed more light on the developmental trajectory to BPD in adulthood, by exploring the impact of personality structure and childhood trauma on BPD symptoms, with a special interest in dissociative experiences.

4.1. Personality structure

Personality structure refers to the dynamic organization of an individual's mental processes, which are repetitive and familiar to the individual (Westen, Gabbard, & Blagov, 2006). These are enduring patterns of perceiving and managing situations, which shape the individual's behaviour and subjective experience of their environment (Bradley & Westen, 2005). A wide range of functional domains underlie the personality structure, including affective, cognitive and self-regulatory capacities, quality of self-other representations and the ability to develop and maintain meaningful relationships (Zimmermann et al., 2012). An inflexible and maladaptive structural organization can give rise to significant functional impairment and substantial distress (Kernberg, 1996).

It is hypothesized that the structure of personality develops through the experiences of relationships (Fonagy & Target, 1997). A validating environment in early life is crucial for the development of adaptive personality functioning in adulthood (Crowell, Beauchaine, & Linehan, 2009). The experience of a consistent caring and appropriately responding caregiver is believed to set the grounds for the development of

efficient internal self-regulating capacities (Fonagy, Target, Gergely, Allen, & Bateman, 2003). This allows for a secure separation from the object through the development of adaptive and stable representation of the self and others, which facilitate a stronger sense of self-autonomy (Bowlby, 1969; Bretherton, Bates, Benigni, Camaioni, & Volterra, 1979). As the self develops it gains coherence, a sense of identity, as well as the capacity to regulate its self-image and self-worth. The combination of these qualities determine the quality of the structural integration. A well-integrated personality structure allows the individual to adapt to a wide range of intrapsychic and interpersonal contexts (Schauenburg & Grande, 2011).

1.1.1. Assessment of personality structure

The heterogeneity between BPD patients and high co-morbidity is partially a result of the shortcomings of the current classification system of PD (Zimmermann et al., 2012). The DSM-5 and ICD-10 approach fails to appropriately consider the dimensional nature of personality pathology and is based on limited empirical evidence (Clark, 2007; Livesley, 1998; Westen & Shedler, 1999;Widiger & Trull, 2007). In an aim to improve the specificity and sensitivity of PD assessment several dimensional measures have been developed for the assessment of personality structure. A few examples of expert rating scales are the Structural Interview (Kernberg 1981, 1984), which assesses the level of personality organization, by exploring identity formation, defenses and reality testing. The Structured Interview of Personality Organization (Clarkin et al., 2004) is another example of a semi-strcutured interview that evaluates the psychic structure and structural change through measuring core domains of personality functioning (identity consolidation, quality of object relations, use of advanced or

primitive defenses, nature of reality testing and perceptual distortions, quality of aggression, and moral values). The use of self-report questionnaires has also been gradually growing, as the qualities explored in the assessment of personality structure are believed to be relatively constant and close to awareness (Dinger et al., 2014). Examples of such measures include, Temperament and Character Inventory (TCI; Cloninger, Svrakic & Przybeck, 1993); Dimensional Assessment of Personality- Basic Questionnaire (DAP-BQ; Livesley, Jang & Vernon, 1998) and Severity Indices of Personality Problems (SIPP-118, Verheul, et al., 2008). However, these measures are relatively long, ranging from 118 to 290 items. Furthermore, the TCI has been primarily used in research and does not provide a sufficiently useful psychotherapeutic perspective of personality structure (Ehrenthal et al., 2012). Therefore there is still a need to develop a reliable and clinically useful instrument for the assessment of structural organization.

The significance of personality structure in mental health problems and psychotherapy outcomes has brought growing attention to the Level of Structural Integration Axis of the Operationalized Psychodynamic Diagnosis (OPD; OPD Task Force, 2008; Zimmermann et al., 2012). This is a new self-report measure (Ehrenthal et al., 2012) that was translated to from German to English for the purpose of this study. It was developed from the OPD, which is a multiaxial diagnostic classification system for the assessment of personality dysfunction that is rooted in psychodynamic theories (OPD Task Force, 2008). The OPD was developed to enrich the descriptive symptom oriented diagnosis of the ICD and DSM (Zimmermann et al., 2012). OPD conceptualizes personality structure as the self in relationship to the object dividing it across six

categories: self-perception, self-regulation, defense, object-perception, communication and bonding. Each scale yields an individual score for the level of integration, with the overall total of all categories serving as a profile of structural integration. This provides a measure of basic capacities that determine the quality of structural integration, which are necessary for the development and maintenance of successful relationships (Schauenburg & Grande, 2011).

1.1.2. Characteristics of compromised structural integration

Individuals with low levels of structural integration demonstrate impaired understanding of self and others, a tendency to enact internal conflicts in relationships and a severely impaired emotional regulatory function (OPD Task Force, 2008). Compromised integration may make one more vulnerable to experiencing frequent flooding by intense and negative affect and increase risk of engaging in self-destructive behaviours. Fonagy and Target (1997) argue that self-organization is rooted in the capacity to mentalize (i.e. understanding behaviour as a product of intentional mental states). An impaired interpersonal understanding of oneself and others, may lead to social difficulties, as well as impede the development of an enriched and stable sense of self. Accordingly, Müller et al. (2006) found that lower levels of structural integration correlated with deficits in reflective functioning (i.e. the ability to perceive mental states of self and others; Fonagy, Gergely, Jurist, & Target, 2002). The absence of an experience of a caregiver that understands ones' internal states, can lead to distortions of interpersonal processes by internalizing incompatible reflections from the object, which Fonagy et al. term the 'alien self' (Fonagy, et al., 1996; Fonagy and Target, 2000). As this does not map on to the child's state it compromises any sense of coherence of self or

identity. Kernberg (1996) suggested that compromised internal representations increase the risk of psychopathology and personality disturbances. From a biosocial perspective, invalidation of emotional experiences impedes learning processes of labeling and controlling emotional reactions and tolerating distress (Linehan, 1989). Grande et al. (2002, as cited by Zimmermann, et al., 2012) showed that poor structural integration was associated with emotional blunting and difficulties relying on others, as measured by the Scale of Psychological Capacities (Wallerstein, 1991).

The quality of structural integration has been found to correlate with marital status, the level of education, co-morbidity with personality disorders (PDs), suicidal ideation and deliberate self-harm in a population of female psychiatric patients (Spitzer, Michels-Lucht, Siebel, & Freyberger, 2002, as cited by Zimmermann, et al., 2012). Additional studies have shown that clients with PD present with substantially lower levels of structural integration compared to patients without PD (Zimmermann et al., 2012). Patients with cluster C PDs (i.e. avoidant, dependent and obsessive-compulsive) demonstrate higher levels of structural integration than those diagnosed with cluster B PDs (histrionic, narcissistic, borderline and antisocial; Doering et al., 2013; Grande Rudolf & Oberbracht, 1998, as cited by Zimmermann et al., 2012). This is in line with the maladaptive and unstable interpersonal functioning that is common of this client group (APA, 2013; Bradley & Westen, 2005).

1.2. Dissociation as a symptom of poor structural integration

BPD is characterized by symptoms of disturbed cognition that are non-psychotic and transient. These include overvalued ideas of being bad, dissociation and non-

delusional suspiciousness (Lieb et al. 2004). Dissociative symptoms and paranoid ideation are the most common cognitive disturbances in BPD (Skodol et al., 2002). Approximately 75% of BPD patients experience dissociation. Kernberg's (1981, 1996) developmental model suggests that individuals with borderline personality structure present with less developed defenses, unconsciously striving to separate contradictory images to protect positive ones from being overwhelmed. However, this may result in further affective instability, identity disturbances and impaired reality testing (Fischer-Kern et al., 2010). Dissociation is an example of an extreme form of psychological defense that results in a failure to integrate information into consciousness (Putnam, 1993). It is manifested in a disturbance to normal processing, storage and retrieval of thoughts, feelings, sensations and memories. This can help protect the individual from experiencing an overwhelming anxiety when faced with a perceived threat (Putnam, 1991). However, it can become pathological when it is generalized and adopted as a coping response for less severe stressors. Dissociation can be experienced on a wide spectrum of severity levels, from non-pathological (e.g. day dreaming) to more distressing pathological symptoms (e.g. depersonalization, derealization, memory lapses).

BPD patients show significantly higher rates of dissociation compared to healthy controls and other personality disorders (Zweig-Frank, Paris, & Guzder, 1994a; 1994b). BPD patients often report normative dissociative experiences, as well as more severe and disturbing symptoms, which may meet the threshold of an Axis I dissociative disorder diagnosis (DD; Goodman et al., 2003; Korzekwa, Dell, Links, Thabane & Fougere, 2009; Ross, 2007; Sar et al., 2003; Zittel Conklin & Westen, 2005). Zanarini et

al. (2000) found that 68% of BPD patients reported moderate to high levels of dissociative symptoms. Dissociation in BPD appears to be associated with higher frequency of suicidal and self-harming behaviours, as well as chronic co-morbid Axis I disorders (Shearer, 1994; Kemperman et al., 1997). This is in line with the understanding that BPD patients have difficulties in emotional regulation and unstable personality structure, which is likely to make them more susceptible to experiencing dissociative symptoms.

1.3. Childhood trauma

1.3.1. Dissociation in response to trauma

Transient dissociative episodes are common in childhood, when affect regulatory mechanisms are not fully developed (Putnam, 1993). Children commonly present with a range of normative dissociative experiences that may be hard to differentiate from pathological dissociation (Albini & Pease, 1989; Putnam 1993). The occurrences of such experiences decrease significantly through adolescence with relatively low levels of dissociation in healthy adults. The experience of trauma in childhood has been linked to an increase in the frequency of dissociative experiences in adulthood (Putnam, 1991). This suggests that trauma interferes with the normal decline in dissociative experiences with age. The experience of early childhood trauma has been associated with higher risk of developmental failure of integration of the self and may result in a disturbed identity (Albini & Pease, 1989; Fink, 1988).

Pathological dissociation has been linked to the experience of childhood physical, sexual or emotional abuse in BPD (Nijenhuis, Vanderlinden & Spinhoven,

1998; Simeon, Nelson, Elias, Greenberg, & Hollander, 2003; Shearer, 1994; Spitzer, Barnow, Freyberger & Grabe, 2006) and non clinical samples (Briere & Runtz, 1988; Irwin, 1994). An adolescent twin study found no evidence of heritability of dissociative pathology (Waller & Ross, 1997). However, shared environmental factors (e.g. chaotic home environment) accounted for 45% of the variability in dissociative experiences. This suggests that although history of abuse is a significant predictor of dissociation, it does not fully explain the development of psychopathology in adulthood (Goodman et al., 2003).

1.3.2. Trauma in BPD

The role of childhood trauma in the etiology of BPD has been thoroughly studied over the years (Ball & Links, 2009; Barnow et al., 2010; Igarashi et al. 2010; Zanarini et al. 2008). Studies found that 10%-73% of BPD patients report a history of physical abuse by a parent or other adult caretaker and up to 33% report experiencing sexual abuse by an adult caretaker (Reich et al., 1997). Experience of maltreatment in childhood has been found to discriminate BPD patients from other PDs (Links, Steiner, Offord, & Eppel, 1988; Paris, Zweig-Frank, Guzder, 1994; Reich et al., 1997). These findings suggest that childhood trauma is a significant risk factor in the development of BPD. However, the impact of childhood trauma on dissociative symptoms of BPD patients remains unclear (Goodman et al., 2003). Studies have shown that unpredictable, frightening and/or abuse caregiving hinder the development of coherent internal working models of relationships (Lyons–Ruth & Jacobvitz, 1999; Main, Kaplan, & Cassidy, 1985). This is likely to affect the quality of structural integration and lead to difficulties in interpersonal functioning, as well as emotional regulation in adulthood. Compromised

structural qualities might help explain the varied effect of childhood trauma on dissociation in adults with BPD.

1.4. Aims of the current study

After reviewing the existing literature on BPD, it is apparent that there is a need for further research on the significance of structural integration in the development of this disorder. This study aimed to assess the relevance of structural integration in formulating BPD. The relationship between the quality of structural integration and psychological distress in non-psychiatric and BPD samples was explored. It was hypothesized that BPD patients will demonstrate higher structural impairment (i.e. lower structural integration), which will correlate with higher levels of distress and dissociation. To help improve understanding of the heterogeneity of BPD presentations the study aimed to explore the role of structural integration in mediating the impact of traumatic childhood experiences on dissociation in adulthood. Individuals with a history of maltreatment and compromised structural integration were expected to report of more severe dissociation.

Research questions

1. Is the quality of structural integration related to the severity of psychological distress?

2. Is there evidence to indicate that poor quality of structural integration is related to BPD diagnosis and symptoms?

3. Does childhood trauma relate to BPD and dissociative symptoms?

4. Is the impact of childhood trauma on dissociation in adulthood mediated by the quality of structural integration?

5. Methods

5.1. Design

The study used a cross-sectional questionnaire-based design. Participants completed a series of self-report questionnaires that were integrated in the assessment battery of a study directed by Peter Fonagy and Read Montague at UCL(ongoing).

5.2. Ethical approval and joint working

Ethical approval was granted for this study, as part of a larger scale ongoing research project (Fonagy, 2014), by the Research Ethics Committee (REC) of Wales for multisite recruitment (Appendix 3). This study was part of a joint project co-let by Daniel Ghossain (2014; Appendix 4). R&D approval was obtained for each site individually prior to starting recruitment from that service. This study focused on a subset of self-report measures included in the assessment battery, which participants were asked to complete (Appendix 5).

5.3. Participants and setting

The study assessed 196 participants between the ages of 18-65. The clinical sample was recruited from outpatient community services for PD within the Greater London area. Clinical participants included in the study were either on the waiting list or in the assessment phase for therapy. Healthy controls (HC) were also recruited from the

Greater London area. Table 1 presents the inclusion and exclusion criteria that guided recruitment

Table 1. Inclusion and exclusion criteria

Inclusion criteria
Age between 18 and 65 at the time of the assessment
Fluent in writing and understanding English
Able and willing to attend two assessments, each with a duration of several hours
Control sample: Absence of PD (e.g. SAPAS total score<4)
Clinical sample: PD diagnosis
Exclusion criteria
Current or past history of neurological disorders or trauma including epilepsy, head injury, loss of consciousness
Learning disability requiring specialist educational support and/or medical treatment

5.4. Recruitment

BPD patients were identified and referred by clinicians working in outpatient services accepting PD referrals. Participants were provided with information regarding the study and were contacted by the research team after expressing interest.

The control sample was recruited via UCL Psychology department volunteer databases and similar volunteer systems, as well as via advertisement in the community using posters to provide basic information about the study. Those who contacted the study team in response and were willing to provide their name, age, sex and contact details, were considered to have made an expression of interest.

5.5. Assessment procedure

Participants who met the sample requirements were invited to a personal appointment to undertake the assessment. All participants were asked to read the study's information sheet and provide written informed consent (Appendix 6). The assessment took place in the participants' local mental health service from which they were referred from or at the Wellcome Trust Centre for Neuroimaging (UCL) in Central London. Clinicians and researchers were trained in administering the assessment battery prior to starting the study. The assessment was usually carried out over two sessions. Participants were compensated by the hour for volunteering their time.

PD diagnosis was established through the administration of the Structured Assessment of Personality – Abbreviated Scale (SAPAS; Moran et al., 2003), which is a brief screening measure for personality disorders developed from the Standardized Assessment of Personality (SAP; Mann, Jenkins, Cutting & Cown, 1981). A cut off score of 4 was adopted, as this has been shown to be a highly reliable clinical threshold for the diagnosis of PD (Moran et al., 2003). Group allocation was determined by referral and SAPAS score. Six HC participants scored above the cut-off score on the SAPAS (>4) and were therefore moved to the PD sample. In addition to this participants in the PD group were administered the Structured Clinical Interview for Axis II disorders (SCID-II; First, Spitzer, Gibbon, & Williams, 1996) to confirm BPD diagnosis.

5.6. Measures

Self-report questionnaire data on psychopathology, behaviour and wellbeing were collected from all participants using the following instruments:

5.6.1. Structural integration

Operationalised Psychodynamic Diagnosis-Structure Questionnaire (OPD-SQ; Appendix 7; Ehrenthal et al., 2012) is a new self-report measure consisting of 95 items (Schauenburg & Grande, 2011). It was developed based on the semi-structured interview assessment measure of the structural axis of the OPD, which has been thoroughly studied and has shown good inter-rater reliability and construct validity (Chan, Rogers, Parisotto, & Biesanz, 2011; Cirpka et al., 2007). The OPD-SQ consists of 8 sub-scales, which explore concrete and clinically relevant traits (e.g. self-perception, self-regulation, defense, object perception, internal/external communication and internal/external attachment). All items are rated on a 5-point Likert scale ranging from "no agreement at all" to "total agreement". The questionnaire includes 12 reversed items for reliability calculations and produces individual scores for each subscale, as well as an overall estimate of structural functioning. High scores on the separate subscales and the global measure indicate poor structural integration.

The German version of the OPD-SQ (Ehrenthal, et al., 2012) was found to have satisfactory to good internal consistency of individual subscales and overall global measure (Cronbach's α=.72 to .91). The questionnaire also significantly distinguished between non-clinical, outpatients and inpatients samples with medium to large effect sizes (d=.64 -1.5). The quality of structural integration also differed significantly

between participants with and without PD, with a small to medium effect size (d=.38). The OPD-SQ has recently been translated from German to English. The translation process was informed by the stepwise protocol developed by International Quality of Life Assessment (IQOLA; Bullinger et al., 1998). This involved translation of the original questionnaire to English (i.e. forward translation) by professional and native English speakers, who are fluent in German with knowledge of the subject area. Following this the translated version of the questionnaire was translated back to German (i.e. backward translation) by one professional translator, who was a native German speaker and fluent in English. The forward and back translations were analyzed for discrepancies and discussed with an external reviewer. This led to minor modification of the questionnaire to further improve wording quality. The revised version (Appendix 8) of the translated questionnaire was introduced after recruitment for the study began. The new version included minor wording amendments to the original one

5.6.2. Demographics

Data on the participants' age, gender, ethnicity, education, profession, employment status and household income were collected using a self-report form.

5.6.3. Symptomatology

The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) is an abbreviated version of the Symptoms Checklist-90-R (SCL-90-R; Derogatis, 1977), which measures the presence of psychological symptoms and stressors in the last 7 days. It consists of 53 items assessing nine symptom dimensions, which include somatization (SOM), obsessive-compulsivity (OBS), interpersonal sensitivity (INS), depression

(DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR), and psychoticism (PSY). The questionnaire also yields a Global Severity Index (GSI), which provides an estimate of overall level of distress. All raw scores are converted to T scores. Individuals are asked to rate the relevance of each item to their experience on a 5-point scale, ranging from 0 (not at all) to 4 (extremely). The measure has been standardized on inpatient and outpatient psychiatric populations, as well as non-psychiatric adults. The internal consistency of all the subscales ranges from .71 for Psychoticism, to .85 for Depression (Derogatis & Melisaratos, 1983). The test-retest reliability coefficient is .91 for the GSI over a two-week period.

The *Structured Clinical Interview for Axis II Disorders (*SCID-II, version 2.0; First, Spitzer, Gibbon, Williams & Benjamin, 1997) is a semi structured diagnostic assessment instrument for personality disorders according the DSM-IV. It is administered by trained clinician's and commonly used in research, as well as clinical settings. The assessment of 10 PDs covered by the SCID-II were administered in this study to establish BPD diagnosis in the clinical sample and assess for the presence of co-morbid Axis II disorders. Healthy controls were not administered this assessment. The SCID-II explores enduring patterns of inner experience and behaviour that deviate markedly from the expectation of the individual's culture. It assesses stable characteristics that are frequently present over a time period of at least five years, with an onset in early adulthood or earlier. The interview aims to assess enduring patterns that are inflexible and pervasive across a broad range of personal and social situations. These are evaluated according to the level of distress and impairment they cause for the

individual. Maffie et al. (1997) reported adequate to excellent inter-rater reliability and satisfactory internal consistency (.71-.94).

5.6.4. BPD features

Personality Assessment Inventory- Borderline Features (PAI-BOR; Morey, 1991) assesses attributes that are commonly associated with personality disorders, particularly BPD. It provides an indication of poor affect regulation, anger control, intense and often combative interpersonal relationships, identity confusion and unstable self-worth, as well as impulsive behavior that often result in self-harming behaviours. The questionnaire is composed of 24 items that are rated on a 4 point scale ranging from false to very true (0-3). These are divided into four subscales: Affective Instability; Identity Problems; Negative Relationships and Self-Harm (all expressed as T scores). An overall T score of 59 or less indicates of a person, who is relatively emotionally stable and has stable relationships. A person scoring 70 or higher on all subscales is likely to meet diagnostic criteria for BPD. They are likely to present with increased impulsivity, affect dysregulation, a difficulty to sustain meaningful relationships and have ambivalent feelings about interactions with others. The PAI-BOR is a reliable and valid tool for measuring the degree to which borderline personality features are present (Morey, 1991; Trull, 1995, 2001).

5.6.5. Dissociation

The *Dissociative Experience Scale (Bernstein & Putnam, 1986)* is a self-report measure, assessing the frequency of dissociative experiences. It includes 28 items, rated on a visual analogue scale depicting the frequency of the dissociative symptoms from 0

(never experienced) to 100 (continually experienced). The items are clustered in four subscales representing the main features of dissociation including, amnesia, which is a form of memory loss (e.g. not knowing how you got somewhere); depersonalization/derealization, feeling detached from one's self and mental processes or sense of unreality of the self (e.g. feeling that you are standing next to yourself); absorption, being preoccupied by something to the point that you are distracted from what is going on around you. The DES has been reported to have very good validity and reliability (Carlson et al., 1993; Carlson & Putnam, 1993), with a satisfactory test retest reliability (.84-.96; Kihlstrom, Glisky, & Angiulo,1994; Ross, Norton, & Anderson, 1988). It has been widely used as a screening tool for identifying potential DD clients from other psychiatric clients and as a research tool (Boeker et al., 2008). However, it is not recommended as a diagnostic measure. For this purpose a DES-Taxon measure was developed (Waller, Putnam & Carlson, 1996), which relies on a subset of eight items, providing a more accurate measure of dissociative pathology that is more reliable in distinguishing between patients with and without DD.

5.6.6. Childhood trauma

The *Childhood Trauma Questionnaire- Short Form (CTQ-SF; Bernstein et al., 2003)* is a brief screening tool for a history of childhood abuse and neglect in adolescents and adult clients. The CTQ-SF was developed from Bernstein et al.' 70-item self administered Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998; Bernstein et al., 1994). It consists of 28 items, which are divided over five scales: Physical Abuse; Sexual Abuse; Emotional Abuse; Physical Neglect and Emotional Neglect. Items are rated on a 5-point Likert scale ranging from 1 (never true) to 5 (very

often true). This measure has been shown to have high convergent and divergent validity with trauma histories from other measures, as well as high sensitivity to identifying individuals with verified histories. The CTQ has satisfactory internal consistency (=.63-.95) and good criterion related validity (Bernstein et al., 2003).

5.6.7. Sample size

Power calculations for this study was informed by the findings of Ehrenthal et al. (2012), who reported that the OPD-SQ successfully distnguished between non-psychaitric patients and outpatients with a large effect size (d=.84) and between PD and non-PD participants with a meduim effect size (d=.38). Based on these findings a power analysis using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007), assuming equal samples, indicated that a sample size of 60 participants in total will be needed to test a two-tailed hypotheses where a medium effect size (f^2=0.2) is expected at a statistical significance of 0.05 with 80% power. The achieved sample size was 193.

5.7. Statistical analysis

5.7.1. Overview

Data analysis was carried out using the Statistical Package for the Social Sciences Version 21 (SPSS). A preliminary data analysis was conducted to identify missing values and violations of normality. Because the English version of the OPD-SQ has not been studied before, the internal reliability of the OPD-SQ was explored. Following this the samples were compared on all demographic characteristics using a series of chi-square for categorical data and *t* tests for continuous variables (i.e. ‘age’ and ‘years in education’). The relationship between ‘employment status’ and ‘household

income' was explored to test the hypothesis that these categories are related and if so the latter will be sufficient to use as a covariate. The variables age, gender, household income and educational level were used as covariates in all analyses of measures of interest.

The validity of the groups was established through a series of between group comparisons of BSI, PAI, CTQ and DES scores. This was carried out using multivariate analysis of covariance (MANCOVA) for each measure independently, controlling for demographic variables. The number of PD participants meeting one or more criteria for PD diagnosis on the SCID-II was assessed. Estimates of effect sizes were computed for all between group comparisons using partial eta-squared (η^2_p). Cohen's (1988) rule of thumb for assessing partial eta-squared effect size was adopted, classifying values of .02, .13 and .26 as representing small, medium and large effect sizes.

The difference between control and PD participants, as well as the two versions of the questionnaire was assessed using MANCOVA, controlling for demographic variables. To establish the link of structural integration with psychological distress and BPD, partial correlations were conducted with all psychological measures within each sample using key demographic variables as covariates (e.g. age, gender, household income and educational level). The effects of childhood trauma on psychological distress, personality disorder and features, as well as dissociation were explored using partial correlation analysis. To control for inflation of Type I error, due to multiple comparisons, Bonferroni adjusted alpha values were used (i.e. dividing alpha of .05 by number of comparisons). Correlation coefficients were evaluated based on Cohen's (1988) categorization of .1, .3 and .5 as representing small, medium and large effect

sizes.

An exploratory canonical correlation analysis was performed to explore the common features of structural integration with symptom severity and borderline personality features in the BPD sample. A canonical correlation analysis is based on the association between one set of dependent variables and another set of independent covariates in order to determine the smaller dimension by which the dependent set can be defined, or in other words, the most efficient structure of borderline features (as measured by the PAI) and symptom severity (as measured by the BSI) in predicting the quality of structural integration (as measured by the OPD-SQ).

A mediation analysis of structural integration, dissociation and childhood trauma was conducted to explore the possible indirect effect of personality structure. Preacher and Hayes (2008) bootstrapping method was applied. Similar to all other tests, age, gender, household income, educational level, OPD-SQ version and group were entered as covariates.

5.7.2. Preliminary analysis

Missing values

All self-report measures had incomplete cases ranging from 1.6% to 6.7% missing values. The Avoidant PD subscale of the SCID-II had the highest percentage of missing data, with 69.9% missing values. It was hypothesized that this subscale was not consistently administered due to time constraints and therefore was excluded from the analysis. All other SCID-II subscales had 7.8% to 24.3% missing values. Three cases

were missing data for all questionnaires and/or demographics were removed from analysis.

To minimize the risk of bias in the data a Missing Values Analysis (MVA) was conducted on all remaining cases. The sample was divided according to the OPD-SQ version administered, due to significant difference between versions. In order to assess whether the missing values occurred entirely at random and independent of both observable variables and unobservable parameters, Little's Missing Completely at Random (MCAR) Test was carried out for each group. The missing values were found to be random in both groups, those that completed the original OPD-SQ version (χ^2 (172)=189.65, p=0.169) and those that were administered the revised version (χ^2 (243)=231.38, p=0.693). The PD sample was also assessed separately to verify the pattern of missing values of the SCID-II data, which was only administered to this group. Similar to the self-report measures the missing values were found to be missing completely at random for the original version of the OPD-SQ (χ^2 (74)=52.02, p=0.976), as well as the revised version (χ^2 (170)=177.69, p=0.327). Consequently missing values were imputed separately for each OPD-SQ version using the multiple imputation technique for OPD-SQ, CTQ, DES, BSI and PAI subscales. The SCID-II values were imputed separately only for the PD sample. Only one imputation was carried out, as the majority of measures had approximately 5% missing values or less (Little, 2013).

Data distribution

The normality of the samples was assessed using a visual analysis of histograms and tests of skewness and kurtosis. The PD sample was normally distributed on all

measures. However, as expected the HC sample was heavily skewed to the left on most measures, except for the PAI and all subscales of the OPD-SQ apart from the 'Internal Attachment' subscale. This floor effect confirms that healthy participants experienced minimal symptoms, as expected. To avoid inflation of the gap between the HC and PD distributions outliers were not treated, as it was thought that this would provide a more ecologically meaningful comparison. Glass et al. (1972) argues that skewed and non-normal distributions have little effect on the error rate and power of the F ratio in two-tailed tests. Based on this analysis of variance tests were used despite violations to normality.

Internal consistency of OPD-SQ

To confirm the internal reliability of the measure was maintained after translation to English, the internal reliability of the OPD-SQ was measured by calculating the Cronbach's α for all subscales and overall total scale (Appendix 9). All subscales were found to have high reliabilities, ranging from .8 to.97. The overall internal consistency of the questionnaire was high, with Cronbach's α=.97. This is in line with the reports of the validation study of the German version of the OPD-SQ (Johannes et al., 2012).

6. Results

6.1. Sample characteristics

The BPD sample consisted of 103 clinical participants who were compared to 90 HCs. The demographic characteristics of the participants who took part in the study are described in Table 2. The mean age of participants in the study was 30.6, ranging from

18 to 65 years of age (SD=10.59). The majority of participants were female (60.9%). This is in accordance with the literature, which suggests that BPD is more commonly diagnosed in women (APA, 1994). The PD sample consisted of significantly more female participants (χ^2 (1)=14.49, p<0.001). Fifty five percent of the sample were White or White British, 10.5% were Black British, 8.4% were Asian and 13.7% were "other". The sample was composed of 35.4% of participants who were employed, 45.5% who were unemployed and 19% "other". The annual household income of 50.9% of the sample was less than £10,000, 21.1% earned between £10,000-20,000 and 28% reported of an income above £20,000. As expected employment status was associated with household income (χ^2 (4)=29.538, p<0.001).

The majority of the BPD sample scored above the cut-off score for Axis II diagnosis (89.3%) according to the SCID-II. Approximately half of the participants met criteria for more than one PD diagnosis, with 24.3% diagnosed with two PDs, 24.3% with three PDs and 6.9% with four PDs. This is line with findings that PD co-morbidity is highly common (Tyrer & Ferguson, 2000). The distribution of PDs identified in the sample is presented in Table 2. The most frequently diagnosed Axis II disorder was BPD (73.8%) followed by OCPD diagnosis (34%). As expected the BPD sample scored significantly higher on all self-report measures (Table 3).

Table 2. Characteristics of the samples

		HC	BPD	Test statistics	*p* value
Female (%)		46.7%	73.8%	$\chi^2(1)=14.87$	<.001
Age,years, mean (SD)		28.84 (9.9)	32.37 (10.9)	t(191)=-2.33	.02
Ethnicity (%)					
White British		50.6%	59.4%	$\chi^2(4)= 2.99$	n.s.
White other		14.6%	9.9%		
Black British		9%	11.9%		
Asian		10.1%	6.9%		
Other		15.7%	11.9%		
Employment status (%)					
Employed		52.2%	20.2%	$\chi^2(2)= 45.07$	<.001
Unemployed		20%	68.7%		
Other		27.8%	11.1%		
Annual household income					
Less than 10,000		31.1%	66%	$\chi^2(2)= 32.43$	<.001
10,000-20,000		20%	20.4%		
Above 20,000		48.9%	13.6%		
Educational level (%)					
Vocational level		8.9%	9.7%	$\chi^2(4)=4.14$	n.s.
GCSE		22.2%	25.2%		
A level		34.4%	23.3%		
Higher education or professional equivalent		25.6%	22.3%		
Other		8.9%	15.5%		
Years in education		13.43 (4.4)	14.24 (5.1)	t(191)= -0.889	n.s.
SCID-II- *Meet criteria n (%)*[a]					
Cluster B					
Borderline	---	76 (73.8%)			
Narcissistic	---	5 (4.9%)			
Histrionic	---	0			
Antisocial	---	0			
Cluster C					
Obsessive Compulsive	---	35 (34%)			
Avoidant	---	31 (30.1%)[b]			
Dependant	---	8 (7.8%)			
Cluster A					
Paranoid	---	33 (32%)			
Schizoid diagnosis	---	15 (14.6%)			
Schizotypal	---	4 (3.9%)			

Note: [a] HC were not administered the SCID-II; [b]69% of the cases were missing values and therefore this subscale was excluded from further analysis. *

Table 3. Profile of psychological distress (BSI), borderline personality features (PAI) and dissociation (DES) in BPD and HC samples

Measure	HC	BPD	F (1,186)	η^2_p
	Mean (SD)	Mean (SD)		
BSI				
Depression	43.66 (6.72)	55.54 (9.07)	58.58	.24**
Paranoid	44.24 (5.83)	55.03 (10.18)	52.10	.22**
Psychoticism	42.86 (5.27)	56.23 (8.93)	98.46	.35**
Interpersonal sensitivity	43.46 (5.9)	55.71 (9.34)	61.95	.25**
Somatization	45.24 (6.26)	54.15 (10.8)	25.25	.12**
Obsessive compulsive	43.86 (6.45)	55.36 (9.47)	55.13	.23**
Anxiety	43.59 (5.07)	55.6 (9.89)	57.38	.24**
Hostility	44.23 (5.2)	55.04 (10.47)	55.91	.23**
Phobic anxiety	43.78 (4.48)	55.44 (10.33)	57.61	.24**
Positive symptom index	43.49 (7.34)	55.69 (8.43)	76.44	.29**
General severity index	42.86 (4.94)	56.24 (9.09)	92.5	.33**
PAI-BOR[a]				
Identity problems	43.88 (7.34)	55.35 (8.89)	53.99	.22**
Negative relations	44.55 (8.86)	54.76 (8.4)	25.85	.12**
Self harm	44.19 (6.59)	55.07 (9.72)	41.20	.18**
Affective instability	43.31 (7.29)	55.07 (9.72)	73.92	.28**
PAI total score	43.12 (6.69)	56.01 (8.42)	73.80	.28**
DES[a]				
Taxon clinically significant	9.32 (1.40)	29.31 (2.26)	38.50	.17**
Depersonalization/ derealization	7.64 (1.37)	29.62 (2.63)	39.54	.18**
Amnestic dissociation	9.28 (1.45)	24.37 (2.11)	26.69	.13**
Absorption & imaginative involvement	19.66 (1.89)	45.21(2.17)	61.43	.25**
DES total	11.47 (13.52)	32.13 (21.16)	49.74	.21**

Note: η^2_p = partial eta squared; ** p<.0001; [a] Levene's test of homogeneity of variance was significant for all subscales of PAI and DES. As the variance in the larger sample (BPD) was greater the F ratio can be considered more conservative.

6.2. Comparison of groups and questionnaire versions

Ninety participants (46.6%) from both samples were administered the revised version of the OPD-SQ, out of which 59 (65.5%) were from the BPD sample. Demographic variables did not differ significantly between participants, who completed the first version of the questionnaire and the second. A two-way MANCOVA revealed that two demographic variables, gender and years in education, were significantly related to the OPD-SQ outcome ($F(8,178)=3.54$, $p=.001$; $F(8,178)=2.47$, $p=.01$). After controlling for the effect of key demographic variables, the version of the OPD-SQ was found to have a significant effect on participants' scores on this measure ($F(8,178)=2.72$, $p=.008$, $\eta^2_p=.11$). Significant univariate main effects of questionnaire version were revealed on most subscales of the OPD-SQ with small effect sizes ($\eta^2_p=.01$-$.07$; Table 4). Updating the version of the questionnaire did not have an effect on the External Attachment ($F(1,185)=2.39$, n.s.) and Inward Emotional Communication Scales ($F(1,185)=3.59$, n.s.). Based on these findings the OPD-SQ version was controlled for in all further analyses. The interaction effect of group and OPD-SQ version did not reach statistical significance ($F(8,178)=.64$, n.s.), which suggests that the groups responded similarly to updating the questionnaire.

A significant effect of group on structural integration scores was also revealed ($F(8,178)=20.63$, $p<.0001$, $\eta^2_p=.48$). Based on this finding the univariate main effects of group were examined. These are presented in Table 4. Group was found to have a significant effect on scores across all OPD-SQ measures ($\eta^2_p=.20$ -$.44$, $p<.0001$). These results strengthen the criterion validity of the OPD-SQ in distinguishing between HC

and BPD participants.

Table 4. Structural integration dimensions in HC and BPD samples in original and revised versions of the OPD-SQ

	HC				BPD									
	OPD1(n=59)		OPD2(n=31)		OPD1(n=44)		OPD2 (n=59)		Group			OPD-SQ version		
OPD-SQ subscales	M	(SD)	M	(SD)	M	(SD)	M	(SD)	F	*p*	η^2_p	F	*p*	η^2_p
Self perception	0.94	(.75)	1.24	(.82)	2.69	(1.03)	3.04	(.72)	146.74	<.0001	.44	8.03	.01	.04
Object perception	1.31	(.66)	1.66	(.69)	2.24	(.75)	2.56	(.62)	49.57	<.0001	.21	10.13	.002	.05
Self-regulation	1.10	(.64)	1.49	(.74)	2.53	(1.10)	3.08	(.65)	103.04	<.0001	.36	17.78	<.0001	.09
Object relations	1.29	(.64)	1.68	(.79)	2.08	(.79)	2.53	(.82)	36.66	<.0001	.17	12.57	<.0001	.06
Inward emotional communication	1.34	(.61)	1.53	(.71)	2.26	(.88)	2.42	(.64)	48.55	<.0001	.21	3.59	.06	.02
External emotional communication	1.37	(.57)	1.69	(.67)	2.40	(.83)	2.65	(.63)	61.99	<.0001	.25	8.40	.004	.04
Internal attachment	1.18	(.84)	1.38	(.79)	2.58	(.93)	3.03	(.76)	104.15	<.0001	.36	6.66	.01	.04
External attachment	1.71	(.70)	1.75	(.78)	2.75	(.95)	2.97	(.54)	62.93	<.0001	.25	2.39	.12	.01
Structural integration total	1.28	(.56)	1.55	(.61)	2.44	(.79)	2.78	(.53)	109.05	<.0001	.37	11.86	.001	.06

Note: η^2_p = partial eta squared; OPD1=OPD-SQ original version; OPD2= OPD-SQ revised version

6.3. Structural integration and psychological distress

A series of partial correlations were conducted to assess the relationship between structural integration and psychological distress, personality disorder diagnosis, borderline personality features and dissociative symptoms. All correlations were computed for each group independently, controlling for key demographic variables and OPD-SQ version. To control for inflation of Type I error due to multiple comparisons the alpha value was adjusted using Bonferroni correction (adjusted α=.05/number of comparisons performed related to the hypothesis).

6.3.1. Structural integration and symptom severity

The findings (Table 5) suggest that structural integration positively correlated with current psychological distress in both samples. In both groups the General Severity Index demonstrated the strongest correlation (HC: r(83)=.51, p<.0001; BPD: r(96)=.65, p<.0001). This suggests that higher levels of distress are correlated with higher scores on the OPD-SQ, which indicate of poorer quality of structural integration.

A canonical correlation revealed that two dimensions of symptom severity (out of eight possible dimensions) significantly correlated with the OPD-SQ (p<.05), while the cumulative percent variance explained for these two was 78% (.62, .16 respectively). The results of this analysis are presented in Appendix 10. This indicates that the BSI and OPD-SQ measure distinct constructs that are closely related in BPD participants.

Table 5. Partial correlation between psychological distress and structural integration, controlling for demographic variables and questionnaire version

	OPD-SQ scales								
BSI	Self-perception	Object perception	Self-regulation	Object relations	Inward emotional communication	External emotional communication	Internal attachment	External attachment	Structural integration total
	HC								
Depression	0.38*	.29	.47**	.29	.37**	.41**	.41**	.24	.44**
Paranoid	.42**	.26	.26	.28	.14	.24	.35	.22	.034
Psychoticism	.52**	.29	.47**	.22	.22	.27	.48**	.21	.42**
Interpersonal sensitivity	.41**	.30	.39	.27	.40**	.41**	.35	.18	.41**
Somatization	.26	.32	.26	.32	.03	.26	.42**	.19	.32
Obsessive compulsive	.44**	.29	.34	.43**	.15	.30	.42**	.23	.40
Anxiety	.32	.29	.34	.30	.15	.29	.41	.19	.35
Hostility	.32	.12	.28	.30	.89	.07	.21	.02	.22
Phobic anxiety	.31	.18	.21	.19	.16	.23	.27	.11	.26
General severity index	.53**	.38**	.49**	.43**	.27	.41**	.55**	.27	.51**
	PD								
Depression	.51**	.28	.57**	.34	.41**	.49**	.53**	.48**	.55**
Paranoid ideation	.44**	.42**	.50**	.45**	.40**	.47**	.56**	.41**	.55**
Psychoticism	.60**	.37*	54**	.33	.39**	.40**	.46**	.40**	.53**
Interpersonal sensitivity	.55**	.43**	.57**	.48**	.37**	.51**	.55**	.437**	.59**
Somatization	.36**	.24	.43**	.29	.29	.34	.34	.30	.40**
Obsessive compulsive	.56**	.41**	.54**	43**	.35**	.47**	.54**	.45**	.57**
Anxiety	.53**	.31	.52**	.30	.33	.45**	.43**	.41**	.50**
Hostility	.37**	.34**	.51**	.51**	.22	.34**	.38**	.24	.45**
Phobic anxiety	.49**	.36**	.44**	.36**	.26	.44**	.46**	.422**	.49**
General severity index	.61**	.43**	.64**	.48**	.42**	.55**	.59**	.50**	.65**

Note: ** Bonferonni adjusted $p < .0005$

6.3.2. Structural integration and BPD

The results of the partial correlation show that the diagnosis of borderline personality disorder, as measured by the SCID-II strongly correlates with structural integration, with moderate effect sizes (Table 6). Apart from Inward emotional communication, external attachment and object relations, all factors underlying structural integration were found to be significantly associated with BPD. No other personality disorder appeared to significantly correlate with structural integration. Thus, participants that scored higher on the OPD-SQ were more likely to meet criteria for BPD and less likely to present with other Axis II disorders. These findings further strengthen the diagnostic validity of the OPD-SQ in successfully distinguishing BPD from other Axis II disorders.

Borderline personality features, as measured by the PAI-BOR were also strongly associated with structural integration scores on all subscales in either groups or both (Table 7). As indexed by the R2, the OPD-SQ accounted for 11% to 66% of the variance in PAI scores within the HC sample and 14% to 64% in the BPD sample. This strengthens the convergent validity of the OPD-SQ, as a measure of BPD qualities. This also supports the view that self-regulation is a core symptom of BPD , as the Self-Regulation subscale displayed the strongest correlations with PAI scores in both groups, with large effect sizes (i.e. r=.74 subscales average, range 52 to 81).

An exploratory canonical correlation analysis was conducted to further explore the correlations found between structural integration and borderline personality features in the BPD sample (Appendix 11). The results show that a minimum of two dimensions

of personality features (first two dimensions out of four possible dimensions) significantly predict the quality of structural integration ($p<.05$). The canonical correlation of the first dimension was.85, and canonical correlation of the second was.46. These dimensions explain 96% of the variance of structural integration (.87,.09, respectively). This suggests that the PAI and OPD-SQ assess overlapping constructs. This supports the hypothesis that behavioural features characteristic of BPD are strongly associated with the underlying structural qualities in BPD.

Table 6. Partial correlation between personality disorder diagnosis and structural integration controlling for demographic variables and questionnaire version in PD sample (n=103)

	OPD-SQ scales								
SCID-II	Self-perception	Object perception	Self-regulation	Object relations	Inward emotional communication	External emotional communication	Internal attachment	External attachment	Structural integration total
Cluster B									
BPD	.40**	.33	.41**	.32*	.26	.37**	.36**	.31	.42**
Narcissistic	-.10	.07	-.104	-.01	.02	-.04	.08	-.02	-.02
Cluster C									
Dependant	.002	.04	-.11	-.004	-.12	.03	-.11	-.11	-.06
Obsessive compulsive	-.09	-.03	-.02	.10	-.11	-.08	-.11	.03	-.05
Cluster A									
Paranoid	.01	.09	.14	-.03	.03	.07	-.005	-.005	.05
Schizotypal	.005	.18	.06	.14	.06	-.08	.10	.07	.08
Schizoid	-.07	-.04	-.12	-.09	-.15	-.10	-.12	-.14	-.13

Note: ** Bonferonni adjusted $p < .0008$; Histrionic and ASPD diagnoses were not available in this sample; Avoidant PD was excluded from analysis due to high percentage of missing values (69%).

Table 7. Partial correlation between borderline personality features and structural integration controlling for demographic variables and questionnaire version

	OPD-SQ scales								
PAI-BOR	Self-perception	Object perception	Self-regulation	Object relations	Inward emotional communication	External emotional communication	Internal attachment	External attachment	Structural integration total
	HC								
Identity problems	.61**	.64**	.70**	.55**	.49**	.52**	.60**	.44**	.70**
Negative relations	.44**	.56**	.62**	.51**	.31	.44**	.53**	.43**	.59**
Self-harm	.41**	.41**	.52**	.59**	.39**	.33**	.39**	.27	.50**
Affective instability	.46**	.46**	.66**	.58**	.36	.45**	.44**	.37	.57**
PAI-BOR total score	.62**	.67**	.81**	.72**	.50**	.56**	.64**	.49**	.76**
	BPD								
Identity problems	.54**	.49**	.60**	.59**	.48**	.48**	.48**	.60**	.65**
Negative relations	.37**	.50**	.55**	.61**	.40**	.50**	.50**	.37**	.58**
Self harm	.47**	.45**	.61**	.49**	.29	.47**	.47**	.43**	.56**
Affective instability	.61**	.60**	.80**	.63**	.48**	.59**	.67**	.54**	.75**
PAI-BOR total score	.61**	.62**	.79**	.71**	.50**	.63**	.65**	.60**	.78**

Note: ** Bonferonni adjusted $p < .001$

6.3.3. Structural integration and dissociative symptoms

Dissociation correlated with the quality of structural integration in PD participants ($r(96)=.41$, $p<.001$), after controlling for demographic variables and questionnaire version. Partial correlations of the DES subscales with OPD-SQ scores are presented in Table 8. Self-perception was also associated with dissociation in both groups with a moderate effect size (HC: $r(83)=.42$, $p<.001$; BPD: $r(96)=.45$, $p<.001$). Self-regulation correlated with dissociation in the BPD sample ($r(96)=.42$, $p<.001$). These findings suggest that participants reporting more frequent dissociative experiences are likely to present with more negative view of themselves and less developed affect regulation.

Table 8. Partial correlation between dissociative symptoms and structural integration controlling for demographic variables and questionnaire version

	OPD-SQ scales								
DES	Self-perception	Object perception	Self-regulation	Object relations	Inward emotional communication	External emotional communication	Internal attachment	External attachment	Structural integration total
	HC								
Taxon clinically significant	.47**	.29	.18	.29	.34	.29	.37	.17	.37
Depersonalization /derealization	.47**	.26	.20	.26	.30	.30	.37**	.19	.36
Amnestic dissociation	.30	.19	.05	.26	.21	.21	.28	.13	.25
Absorption & imaginative involvement	.27	.24	.08	.24	.11	.18	.28	.15	.24
DES total	.42**	.28	.14	.30	.26	.27	.36	.18	.34
	BPD								
Taxon clinically significant_	.45**	.27	.40**	.34	.30	.27	.31	.25	.40**
Depersonalization /derealization	.41**	.22	.35**	.28	.25	.18	.23	.21	.33
Amnestic dissociation	.36**	.32	.40**	.43	.25	.32	.30	.23	.40**
Absorption & imaginative involvement	.44**	.33	.41**	.39**	.27	.29	.29	.29	.42**
DES total	.45**	.31	.42**	.38**	.29	.28	.30	.26	.41**

Note:** Bonferonni adjusted p< .001

6.4. Childhood trauma in BPD sample compared to HCs

The difference between BPD and HC participants in aversive childhood experiences was assessed using a factorial MANCOVA, controlling for key demographic variables. Levene's test showed that the variance was significantly different in the HC compared to the BPD sample on all subscales of the CTQ (CTQ total: $F(1,191)=18.57$, $p<0.001$), apart from the Emotional Neglect scale. Glass et al. (1972) suggested that the F ratios tend to be conservative when the larger variance is in the larger sample. The BPD sample (n=103), which was bigger than the HC group (n=90), presented with greater variance across all subscales of the CTQ, reducing the likelihood of a Type I error. The results revealed a statistically significant multivariate effect for group ($F(5, 183)=6.48$, $p<0.001$, $\eta 2p=.15$), with significant effects of two of the covariates, gender ($F(5, 183)=5.88$, $p<0.001$, $\eta 2p=.14$) and income ($F(5,183)= 2.55$,$p<.05$, $\eta 2p=.06$). Follow-up ANOVA results (Table 9) point to a significant effect of group across all types of trauma measured by the CTQ.

Table 9. Reports of childhood trauma by BPD and HC participants

	HC	BPD			
CTQ subscales	M (SD)	M (SD)	F	*p* value	$\eta 2_p$
Emotional abuse	9.77 (5.09)	15.97 (6.45)	21.37	<.0001	.10
Emotional neglect	11.64 (5.66)	17.05 (5.66)	26.00	<.0001	.12
Sexual abuse	6.74 (5.14)	11.09 (7.36)	7.62	.006	.04
Physical abuse	7.48 (4.15)	11.55 (6.29)	10.86	.001	.05
Physical neglect	7.70 (3.24)	11.26 (5.05)	18.76	<.0001	.09
Total	43.33 (17.21)	66.92 (23.82)	27.58	<.0001	.123

Note: Univariate effects of group on sub-types of childhood trauma (df=1, 187). η^2_p = partial eta squared.

6.5. Is childhood trauma related to psychological distress in adulthood?

To establish the effects of childhood trauma on adulthood a series of partial correlations was carried out assessing general psychopathology, personality disorder diagnoses and features, as well as dissociation. Similar to the OPD-SQ analysis to gain an estimate of the direct relationship of the constructs of interest, key demographic variables were controlled for (i.e. age, gender, income and years in education). To control for inflation of Type I error due to multiple comparison the alpha value was adjusted using Bonferroni correction.

6.5.1. Childhood trauma and Axis II disorders

Partial correlation analysis of childhood trauma and Axis II diagnosis (as measured by SCID-II) was carried out to assess the relationship between personality disorders to childhood trauma (Table 10). BPD was the only disorder that significantly

correlated with emotional abuse (r(97)=.36, p<0.0001), physical neglect (r(97)=.32, p<.0001) and total CTQ score (r(97)=.37, p<.0001). Childhood trauma did not correlate significantly with any other personality disorder, demonstrating small effect sizes (i.e. r=.02 to .26). This suggests that physical or emotional suffering in early life is associated with BPD in adulthood.

Table 10. Partial correlation between personality disorder diagnosis and childhood trauma controlling for demographic variables in PD sample (n=103)

SCID-II	Emotional abuse	Sexual abuse	Physical abuse	Emotional neglect	Physical neglect	CTQ total
Cluster B						
BPD	.36**	.29	.21	.24	.32**	.37**
Narcissistic	.06	.14	.11	.04	-.08	.08
Cluster C						
Dependant	-.16	-.15	-.16	.02	-.16	-.16
Obsessive compulsive	-.01	.09	-.05	-.13	-.14	-.05
Cluster A						
Paranoid	.15	.26	.18	-.06	.02	.16
Schizotypal	-.05	-.05	.04	.00	-.06	-.03
Schizoid	-.16	-.02	-.18	-.14	-.26	-.18

Note: ** Bonferonni adjusted *p*< .0007; Histrionic and ASPD diagnoses were not available in this sample; Avoidant PD was excluded from analysis due to high percentage of missing values (69%).

Childhood trauma and borderline personality features

The relationship between borderline personality feature and the experience of childhood trauma is presented in Table 11. Emotional abuse significantly correlated with affective instability in both groups after controlling for demographic variables (HC: r(84)=.39, p<.0001; PD: r(97)=.39, p<.0001) and negative relations (HC: r(84)=.33, p<.002; PD: r(97)=.31, p<.002). This might partially explain the correlation found between emotional abuse and BPD. The experience of sexual abuse in childhood was found to be related to more severe identity problems in HC participants (r(84)=.41,

p<.0001).

Table 11. Partial correlation between borderline personality features and childhood trauma controlling for demographic variables

PAI-BOR	Emotional abuse	Sexual abuse	Physical abuse	Emotional neglect	Physical neglect	CTQ total
	HC					
Identity problems	.16	.41**	.04	.02	-.07	.18
Negative relations	.33**	.24	.16	.11	.13	.28
Self-harm	-.01	.26	-.10	-.09	-.07	.01
Affective instability	.39**	.24	.22	.19	.19	.35
PAI-BOR total score	.29	.36**	.11	.07	.07	.27
	BPD					
Identity problems	.18	.01	.11	.14	.05	.12
Negative relations	.31**	.10	.20	.10	.10	.21
Self-harm	.28	.10	.14	.06	.17	.19
Affective instability	.34**	.07	.20	.23	.28	.28
PAI-BOR total score	.34**	.09	.20	.16	.19	.25

Note: ** Bonferonni adjusted $p < .002$

6.5.2. Childhood trauma and dissociation

The correlations of different types of childhood trauma to the experience of dissociation in adulthood are demonstrated in Table 12. The degree of experiencing childhood trauma in HC was not associated with participants' reports of dissociative symptoms. In the BPD sample the more aversive childhood experiences the individual endured the more likely they were to experience more severe dissociation (r(97)=.19-.52). Emotional abuse particularly was found to be associated with dissociative symptoms with a medium to large statistically significant effect size (r (97)=.43-.52). Physical abuse (PA) and physical neglect (PN) were also significantly correlated to dissociation scores in BPD with a medium effect size (PA: r(97)=.35; PN: r(97)=.34). DES scores were also associated with sexual abuse in BPD participants with moderate effect size (r(97)=.31).

Table 12. Partial correlation between dissociative symptoms and childhood trauma controlling for demographic variables

DES	Emotional abuse	Sexual abuse	Physical abuse	Emotional neglect	Physical neglect	CTQ total
	HC					
Taxon clinically significant	.20	.21	.11	.11	.16	.22
Amnestic dissociation	.16	-.04	.04	.10	.30	.14
Depersonalization/derealization	.22	.21	.16	.15	.09	.24
Absorption & imaginative involvement	.26	-.07	.04	.25	.30	.21
DES total	.24	.07	.09	.19	.26	.23
	BPD					
Taxon clinically significant	.51**	.33**	.35**	.25	.35**	.46**
Amnestic dissociation	.43**	.28	.41**	.19	.26	.41**
Depersonalization/derealization	.51**	.30	.28	.26	.34**	.43**
Absorption & imaginative involvement	.47**	.23	.34**	.21	.28	.39**
DES total	.52**	.31**	.37**	.25	.34**	.46**

Note: ** Bonferonni adjusted $p < .002$

6.5.3. Is childhood trauma related to the quality of structural integration?

Childhood sexual abuse correlated with inward emotional communication in HC with a medium effect size ($r(83)=.37$, $p<.0001$; Table 13). Emotional abuse was strongly linked with the OPD-SQ total score ($r(96)=.43$, $p<.0001$) and selected subscales. Internal attachment was found to be the main predictor of childhood emotional abuse ($R^2=.90$). This was not replicated in the correlation between external attachment and emotional abuse ($r(96)=.23$, n.s.). These findings support the hypothesis that the attachment relationship is likely to be directly affected by the experience of emotionally abusive environment in early life, which hinders the development of the personality structure.

Table 13. Partial correlation between childhood trauma and structural integration controlling for demographic variables and questionnaire version

	OPD-SQ subscales								
CTQ subscales	Self perception	Object perception	Self-regulation	Object relations	Inward emotional communication	External emotional communication	Internal attachment	External attachment	Structural integration total
	HC								
Emotional abuse	.24	.28	.16	.20	.17	.24	.23	.17	.25
Sexual abuse	.28	.22	.29	.18	.39**	.20	.25	.09	.29
Physical abuse	.04	.04	-.02	-.01	.22	.11	.09	.10	.09
Physical neglect	.09	.19	.00	.08	.17	.11	.10	-.01	.11
Emotional neglect	.20	.08	.14	.06	-.09	.04	.19	.07	.11
Total	.25	.23	.18	.15	.23	.20	.26	.13	.25
	BPD								
Emotional abuse	.33	.33	.41**	.39**	.36**	.34	.45**	.23	.43**
Sexual abuse	.04	.10	.17	.11	-.01	.14	.08	.07	.11
Physical abuse	.10	.20	.22	.21	.10	.22	.22	.13	.21
Physical neglect	.10	.11	.21	.19	.18	.13	.24	.07	.19
Emotional neglect	.25	.22	.23	.26	.31	.22	.33	.21	.31
Total	.21	.25	.32	.29	.23	.27	.33	.18	.32

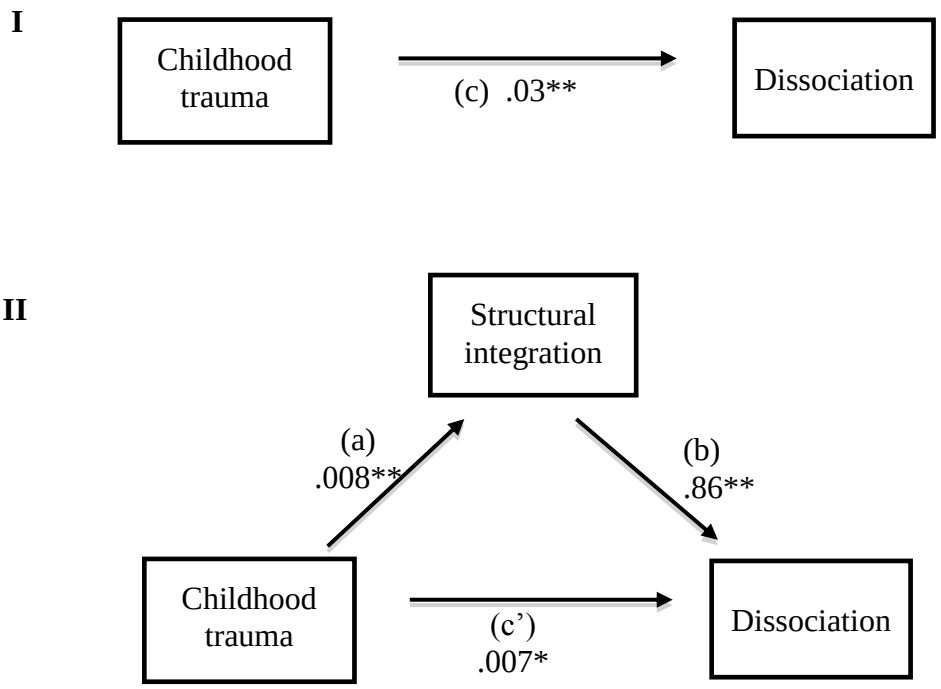
Note: ** Bonferonni adjusted $p < .0009$

6.6. Does structural integration mediate the influence of childhood trauma on dissociation in adulthood?

The correlational analysis revealed that the experience of childhood abuse was associated with more severe dissociative symptoms and poorer structural integration. However, this did not shed light on the mechanism through which childhood trauma influences dissociation in adulthood. The hypothesis that this relationship will be mediated by the quality of structural integration was explored using Preacher and Hayes (2008) bootstrapping method. The direct and indirect effects were evaluated to assess the regression pathways, including (1) Path a, the effect of childhood trauma on structural integration; (2) Path b, the effect of structural integration on dissociation, while controlling for childhood trauma; (3) Path c, the effect of childhood trauma on dissociation in adulthood; (4) Path c', the effect of childhood trauma on dissociation, when controlling for the quality of structural integration (i.e. the direct effect).

The relationship between childhood trauma and dissociation was partially mediated by the quality of structural integration after controlling for key demographic variables, OPD-SQ version and group membership (Fig. 1). As expected, based on the findings of the correlational analysis Path a (relationship between childhood trauma and structural integration) was statistically significant ($r=.008$, $p<.001$), as was path b (the relationship between structural integration and dissociation; $r=.86$, $p<.0001$). The direct effect of childhood trauma on dissociation was 0.028, $p<.0001$. The indirect effect (i.e. the mediation of structural integration) was .007 and 95% bootstrap CI of 0.003 to 0.013 ($p<.01$). Thus, the indirect effect was statistically significant, suggesting a partial mediation model.

Figure 1. The effect of childhood trauma and structural integration on



Note: The relationship between childhood trauma and dissociation without (I) and with (II) the mediating effect of structural integration after controlling for key demographic variables, group allocation and questionnaire version. Path a, the effect of childhood trauma on structural integration; Path b, the effect of structural integration on dissociation, while controlling for childhood; Path c, the effect of childhood trauma on dissociation in adulthood; Path c', the effect of childhood trauma on dissociation, when controlling for the quality of structural integration. * p<.01; **p<.001

7. Discussion

This study explored the relationship between personality structure and BPD, focusing particularly on dissociation as a core symptom of this disorder. All hypotheses were confirmed, as quality of structural integration was significantly correlated with psychological distress, BPD and history of childhood trauma. These findings can help explain the significant interpersonal difficulties that BPD patients experience (APA, 2013; Skodol et al., 2002). This study also adds to the current understanding that childhood trauma can be a predisposing factor of dissociation in BPD, by offering evidence that this trajectory is modified by the quality of structural integration.

4.1. Psychopathology and personality structure

The level of structural integration was associated with symptom severity. The more disrupted the personality structure was, the more severe symptoms were recorded. The latent mechanisms underlying psychological distress were predictive of the quality of structural integration. Linehan (1989) suggests that an unstable sense of self raises the individual's vulnerability to emotional difficulties and maladaptive coping strategies. The results of this study suggest that higher levels of distress are correlated with a less integrated personality structure. It is noteworthy that this relationship was particularly significant in the BPD sample and less so in the control group. A possible explanation for this finding might be that individuals below the threshold of PD posses a more robust personality structure that is less amenable to affects of episodic psychological distress. This study replicates previous findings showing that BPD patients present with higher co-morbidity of Axis I and II disorders (Critchfield, Clarkin, Levy, & Kernberg, 2008;

Skodol et al., 2002). Fischer-Kern et al. (2010) discovered that the severity of structural impairment correspond with the degree of co-morbidity with mood disorders. The mood dependent nature of BPD representations might underlie the difficulties in achieving a sense of continuity, which is characteristic of these patients.

The BPD group scored significantly higher on all dimensions of structural integration after controlling for demographic variables, suggesting greater impairment compared to non-psychiatric participants across all subscales of the OPD-SQ. Furthermore BPD diagnosis was most strongly associated with the profile of structural integration when compared to other Axis II disorders. All other PD disorders were not significantly correlated with individuals' scores on the OPD-SQ. This might help explain the previous findings showing that BPD patients present with fragile identity, poor affect regulation, impulsive behaviours and unstable relationships (Lieb et al., 2004; Linehan, 1989). The overlap revealed between the OPD-SQ and PAI, strengthens the relevance of structural integration in understanding emotional and behavioral features of BPD. Kernberg (1975) proposed that borderline personality organization is rooted in distortions in reality perception, immature and maladaptive defenses, along with problems in representations of others. These difficulties contribute to interpersonal instability often reported by this client group.

The 'states of consciousness' model proposes that pathological dissociation disturbs the ability to modulate states of consciousness and integrate the self across emotions and memories induced by trauma (Putnam, 1991). Accordingly self-perception was found to be associated with dissociative symptoms. This finding was significant in both BPD and control samples. Maladaptive beliefs about oneself and their environment

have been suggested to reduce tolerance to emotional distress and increase vulnerabilities to cognitive dysfunction (Linehan, 1989). Dissociation also correlated with regulation of the self in BPD participants. This is consistent with previous findings that under strong emotional arousal BPD patients may show significant decline in normal functioning, including dissociation (Shedler & Westen, 2004; Conklin, Bradley, & Westen, 2006; Westen & Shedler, 1999a). This supports the consensus across theoretical modalities that BPD patients experience a less coherent and unstable sense of self that is interrupted by dissociative episodes (Bradley & Westen, 2005). Kernberg (1975) suggested that due to problems in differentiating representations of self and other BPD patients are more susceptible to experiencing cognitive disturbances. Accordingly the quality of object relations was found to be related to imaginative involvement and global dissociation severity score in BPD sample and internal attachment with depersonalization in the control group.

4.2. The indirect effect of maltreatment on dissociation

Participants in the BPD sample reported significantly more severe traumatic experiences in childhood compared to control participants. This replicates findings of previous studies that suggest that a history of maltreatment is more common in BPD than the general population (Ball & Links, 2009; Barnow et al., 2010; Igarashi et al. 2010; Zanarini et al. 2008). Adverse childhood experiences were not associated with the diagnoses of other PDs. This supports the findings that childhood history of abuse is common in BPD and differentiates it from other disorders (Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989).

In line with previous studies childhood sexual, emotional and physical abuse, as well as physical neglect were found to be associated with the reports of dissociative symptoms in BPD participants (Nijenhuis, Vanderlinden & Spinhoven, 1998; Spitzer, Barnow, Freyberger & Grabe, 2006; Shearer, 1994). This corresponds with the biosocial model, which suggests that an invalidating environment in early life increases vulnerability to high sensitivity to emotional stimuli and intense responses to even low-level stimuli (Linehan, 1993). The lack of significant correlations between childhood trauma and experience of dissociation in control participants might provide evidence of non-pathological dissociation, which is not a result of trauma (Waller, Putnam, & Carlson, 1996). This might also reflect the variance in the effects of childhood trauma on dissociation in adulthood. Goodman et al. (2003) did not find a significant correlation between childhood trauma and dissociation in a sample of patients presenting with PD. This highlights the complexity of the relationship between trauma and dissociation.

The findings of this study suggest that the impact of trauma on dissociative symptoms in adulthood is partially mediated by the quality of structural integration. Personality structure was found to correlate with the severity of emotional abuse in early life in BPD participants. This is consistent with previous findings linking adverse childhood experiences with compromised integration of the self, disturbed sense of identity and poor structural integration (Albini & Pease, 1989; Fink, 1988; Fonagy & Target, 1997). History of emotional abuse in BPD was most strongly correlated with affect regulation and quality of relationships. This supports the hypothesis that experience of an aversive and invalidating caregiver can lead to emotional and interpersonal difficulties (Linehan, 1989). An experience of an inconsistent, insensitive

and non-empathic parent impedes the development of stable representations of self and others that can be applied in moments of distress, giving rise to symptoms of dissociation. These findings can help explain the increased vulnerability of individual's with history of childhood trauma to transient dissociation.

4.3. Implications for practice and research

Psychodynamic studies have highlighted the contribution of structural aspects of personality in the diagnosis, treatment planning and outcome assessment (Fischer-Kern et al., 2010). However this information can also be relevant for other interventions, as the significance of pervasive personality dysfunction in BPD is widely acknowledged (Linehan, 1993; Skodol et al., 2002). The assessment of structural integration can provide a better understanding of the patient's ability to self regulate and build coherent and stable narratives of their experiences. Patients presenting with comprised personality structure may be less able to tolerate strong emotions that arise within therapy and are likely to be more easily overwhelmed (Ehrenthal et al., 2012). Stern (1938) noted that BPD patients have less resilient psychological stability and security, which may bring rise to more intense feelings in the therapeutic relationship. Such patients are likely to present with greater difficulties in mentalizing and distorted perception of interactions (Fonagy & Target, 1997). They are likely to enact conflicts and respond in a more depressed, angry and despondent nature (Stern, 1938). Assessing the quality of structural integration can therefore provide a more in-depth understanding of the individual's difficulties (Skodol et al., 2002).

The evidence for the benefits of dimensional assessment of PD is slowly growing, as it provides a more comprehensive and sensitive measure of psychopathology (Zimmermann et al., 2012). The results of this study show that the OPD-SQ can be a useful measure in clinical and research settings for a dimensional understanding of personality features. The interview version of the OPD-SQ, named the OPD- Levels of Structural Integration Axis (OPD-LSIA; OPD Task Force, 2008) has been shown to tap general psychopathology as well as specific impairments in personality functioning (Zimmermann et al., 2012). The OPD-SQ also appears to capture both general psychological distress (measured by BSI) and personality characteristics (as measured by the PAI). This study also indicates that structural integration can discriminate BPD from other PDs. However this should be explored in larger samples with sufficient statistical power. The degree of disturbance in self-regulation, self-other presentations and affect regulation is the main focus of the dimensional axis added to the DMS-5 Section III (APA, 2013), which provides useful measures and techniques for improving clinical assessment. The OPD-SQ is a newly developed measure for the assessment of structural integration that can be used in research and in clinical work. The English version of the measure has shown similar psychometric properties to the original German based questionnaire (Ehrenthal et al., 2012). Although the validity of the questionnaire requires further research before firm conclusions can be drawn, this study points to promising qualities of this instrument. The internal consistency of the measure was found to be relatively high (.8 to .97) with all the items hanging well together, suggesting that the measure assesses related constructs. Similar to the reports of Ehrenthal et al. (2012), the OPD-SQ was found to be

effective in differentiating controls from participants with Axis II disorders, which strengthens its construct validity. The overlap in the constructs of the OPD-SQ with the PAI, suggest that it can be a useful instrument for the assessment of underlying mechanisms of BPD. Furthermore this study indicates that OPD-SQ was significantly linked to BPD and not to other PDs. However, this finding should be considered with caution and further explored in future research.

This study replicates findings of previous studies while adding to the understanding of dissociation in BPD. It helps identify the factors relating to dissociation and contributing to its etiology. However, it is not completely clear from these results whether certain features of structural integration are more prominent than others in respect to psychological distress and particularly dissociation. Although the influence of childhood trauma appears to be significant it is also clear from these findings that it cannot explain on its own the development of BPD and particularly dissociative symptoms of this disorder.

4.4. Limitations

The main limitation of the study is the reliance on cross sectional analyses. Although the results suggests of links between childhood trauma, structural integration, BPD and dissociation the direction of causality of these relationships cannot be inferred. This can be perhaps better understood in studies evaluating outcomes of interventions and assessing these constructs in more client groups, such as Axis I disorders or other personality disorders. Achieving a more homogenous sample can also improve the validity of these findings. BPD is a highly diverse diagnosis, which was demonstrated in

the study's sample, as most participants met criteria for co-morbid PD diagnosis. On the other hand approximately a quarter of the sample did not reach the clinical threshold, despite being referred for BPD.

This study compared two populations that differ considerably from one another, which might partially explain the significant results found. The majority of the control sample reported very minimal symptoms, as expected of a non-psychiatric population, whereas the BPD participants scored very high on all the questionnaires. The high percentage of co-morbidity in this sample weakens the findings, as the differences between the groups are not necessarily unique to BPD and might be explained by degree of distress. The groups also differed in gender, household income and years in education. The BPD sample reported of higher levels of distress and dysfunction, which is likely to effect employment and education. However, measures were taken to control for potentially confounding factors. This included controlling for demographic variables and not removing outliers. Group membership was controlled for, but symptom severity was not. Ehrenthal et al. (2012) found that the total score of structural integration did not change significantly when GSI score was controlled for. As the control participants scored very low on all measures keeping the extreme values raised the mean of the sample and therefore reduced likelihood of Type I error. In doing so the possibility of missing an existing effect was increased, which is a central consideration of every study. Due to the minimal symptomatology the control sample was positively skewed, but F tests are considered robust to violations of non-normality (Glass, 1972) and were therefore kept in the analysis.

Another limitation of the study lies in the use of a new measure that was used for the first time in this project. This paper reports promising results of the OPD-SQ. However, more research is required to establish its psychometric properties. Despite the rigorous translation of the questionnaire a few wording improvements were required, which were identified after starting recruitment. This led to introducing a new version of the measure at midpoint. Although this version differed only mildly from the original questionnaire the scores of participants completing the latter version were significantly different than those administered the revised version. The difference found might be partially explained by the difference in the ratio of BPD control participants. The questionnaire version was controlled for, but it would be useful to replicate this study to test whether the findings were real and not due to change in measurement.

4.5. Conclusions

This study provided further support for the presence of structural deficits in BPD patients using a newly developed self-report measure. As expected BPD participants showed more significant difficulties in the qualities underlying structural integration, such as impaired regulation capacities, maladaptive coping strategies, as well as fragile representations of self and others. This indicates of promising construct validity of the OPD-SQ, which should be further studied to ascertain its psychometric properties. The indirect effect of childhood trauma on dissociation strengthens the theory that exposure to an adverse environment in early life can hinder the development of effective capacities for managing stress and increase the individual's vulnerability to transient dissociation as seen in BPD.

Future research can provide further evidence of the importance of structural integration in understanding psychopathology. The emergence of personality structure should be further studied across the age span (e.g. childhood, adolescence and adulthood). This could help improve understanding of the developmental trajectory into developing BPD in adulthood. Assessing structural integration in other PDs and Axis II disorders will help achieve a more specific and sensitive definition of BPD characteristics. This might also help explain the heterogeneity common to this client group. The impact of attachment quality on personality structure should also be explored. This can contribute to the understanding of the etiology of BPD. Finally studying the relevance of qualities underlying structural integration (e.g. perception of self and other, affect regulation skills and quality of relationships) to therapy outcome will facilitate the development of more effective interventions for BPD.

References

Albini, T K., & Pease, T. E. (1989). Normal and pathological dissociations of early childhood. *Dissociation*, 2,144-150.

American Psychiatric Association (1994). Diagnostic and StatisticalManual of Mental Disorders (DSM-IV). 4th Edition. Washington DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing

Ball, J. S., & Links, P. S. (2009). Borderline personality disorder and childhood trauma: evidence for a causal relationship. *Current Psychiatry Reports*, 11, 63–68.

Barnow, S., Arens, E., Sieswerda, S., Dinu-Biringer, R., Spitzer, C., & Lang, S. (2010). Borderline personality disorder and psychosis: a review. *Current Psychiatry Reports*, 12, 186–195.

Beauchaine, T. P., & Marsh, P., (2006). Taxometric methods: Enhancing early detection and prevention of psychopathology by identifying latent vulnerability traits. In D. Cicchetti, & D. Cohen (Eds.), *Developmental psychopathology, Vol 1: Theory and method* (2nd ed.; pp. 931-967). Hoboken, NJ: Wiley & Sons Inc.

Beauchaine, T. P., Neuhaus, E., Brenner, S. L., & Gatzke-Kopp, L. (2008). Ten good reasons to consider biological processes in prevention and intervention research. *Developmental Psychopathology*, 20, 745-74.

Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapareto, E., & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry,* 151, 1132–1136.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J, Hnadelsman, L., Medrano, M., Desmond, D. & Zule, W. (2003). Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse and Neglect,* 27, 169-190.

Bernstein, D., & Fink, L. (1998). *Childhood Trauma Questionnaire: A retrospective self-report*. San Antonio, TX: The Psychological Corporation.

Bernstein, E. M. & Putnam, F. W. (1986). Development, reliability and validity of a dissociation scale. *Journal of Nerves and Mental Disease*, 174, 727-735.

Boeker, H., Himmighoffen, H.,Straub, M., Schopper, C., Endrass, J., Kuechenhoff, B., Weber, S. & Hell, D. (2008). Deliberate self-harm in female patients with affective disorders investigation of personality structure and affect regulation by means of Operationalized Psychodynamic Diagnostics. *Journal of Nervous and Mental Disease*, 196, 743-751.

Bowlby, J. (1969). *Attachment and loss*, Vol. 1. Attachment. London: Hogarth Press and the Institute of Psychoanalysis.

Bradley, R., & Westen, D. (2005). The psychodynamics of borderline personality disorder: a view from developmental psychopathology. *Development and Psychopathology*, 17, 927–57.

Bretherton, I., Bates, E., Benigni, L., Camaioni, L., & Volterra, V. (1979). Relationships between cognition, communication, and quality of attachment. In E. Bates, L. Benigni, I. Bretherton, L. Camaioni, & V. Volterra (Eds.), *The Emergence of Symbols*. New York: Academic Press.

Briere, J., &Runtz, M. (1988). Symptomatology associated with childhood sexual victimization in a non-clinical adult sample. *Child Abuse and Neglect*, 12, 51-59.

Bullinger, M., Alonso, J., Apolone, G., Leplège, A., Sullivan, M., Wood-Dauphinee, S., ... & Ware Jr, J. E. (1998). Translating health status questionnaires and evaluating their quality: the IQOLA project approach. *Journal of clinical epidemiology*, 51, 913-923.

Carlson, E. B., Dalenberg, C., Armstrong, J., Daniels, J. W., Loewenstein, R., & Roth, D. (2001). Multivariate prediction of posttraumatic symptoms in psychiatric inpatients. *Journal of Traumatic Stress*, 14, 549–567.

Carlson, E., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation*, VI, 16–27.

Chan, M., Rogers, K. H., Parisotto, K. L., & Biesanz, J. C. (2011). Forming first impressions: The role of gender and normative accuracy in personality perception. *Journal of Research in Personality*, 45,117-120.

Cierpka, M., Grande, T., Rudlof, G., von der Tann, M., Stasch, M. & the OPD Task Force (2007). The Operationalized Psychodynamic Diangostics System: Clinical relevance, reliability and validity. *Psychopathology*, 40, 209-220.

Clark, L. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology*, 58, 227–257.

Clarkin, J. F., Levy, K. N., Lenzenweger, M. F., & Kern- berg, O. F. (2004). The Personality Disorders Institute/ Borderline Personality Disorder Research Foundation Randomized Control Trial for Borderline Personality Disorder: Rationale, methods, and patient characteristics. *Journal of Personality Disorders*, 18, 52–72.

Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, 50, 975 – 990.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Conklin, C. Z., Bradley, R., & Westen, D. (2006). Affect regulation in borderline personality disorder. *The Journal of nervous and mental disease*, 194, 69-77.

Critchfield, K. L., Clarkin, J. F., Levy, K. N., & Kernberg, O. F. (2008). Organization of co-occurring Axis II features in borderline personality disorder. *British Journal of Clinical Psychology*, 47, 185–200.

Crowell, S. E., Beauchaine, T. P., & Linehan, M. M. (2009). A biosocial developmental model of borderline personality: Elaborating and extending Linehan's theory. *Psychological bulletin*, 135, 495.

Derogatis, L. R. (1977). *SCL-90-R: Administration, scoring and procedures manual II*. Towson, MD: Clinical Psychometric Research.

Derogatis, L. R., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine*, 13, 595–605.

Dinger, U., Schauenburg, H., Hörz, S., Rentrop, M., Komo-Lang, M., Klinkerfuß, M., ... & Ehrenthal, J. C. (2014). Self-Report and Observer Ratings of Personality Functioning: A Study of the OPD System. *Journal of personality assessment*, 96, 220-225.

Doering, S., Burgmer, M., Heuft, G., Menke, D., Bäumer, B., Lübking, M., ... & Schneider, G. (2013). Reliability and validity of the German version of the Structured Interview of Personality Organization (STIPO). *BMC psychiatry*,13, 1-13.

Ehrenthal, J. C., Dinger, U., Horsch, L., Komo-Lang, M., Klinkerfuss, M., Grande, T., & Schauenburg, H. (2012). Der OPD-Strukturfragebogen (OPD- SF): Erste Ergebnisse zu Reliabilität und Vlidität [The OPD Structure Questionnaire (OPD-SQ): first results on reliability and validity]. *Psychotherapie, Psychosomatik, medizinische Psychologie*, 62(1), 25-32.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.

Fink, D. L. (1988). The core self: A developmental perspective on the dissociative disorders. *Dissociation*, l, 43-47.

First, M. B., Gibbon M., Spitzer R. L., Williams, J. B. W. & Benjamin, L.S. (1997). *Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II).* Washington, D.C.: American Psychiatric Press, Inc.

Fischer-Kern, M., Buchheim, A., Hörz, S., Schuster, P., Doering, S., Kapusta, N. D., Taubner, S., Tmej, A., Rentrop, M., Buchheim & P., Fonagy, P. (2010). The relationship between personality organization, reflective functioning, and psychiatric classification in borderline personality disorder. *Psychoanalytic Psychology*, 27, 395-409.

Fonagy. P. (2014). (Probing social exchanges- a computation neuroscience approach to the understanding of borderline and anti-social personality disorder). Unpublished raw data.

Fonagy, P. & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology*, 9, 679-690.

Fonagy, P. & Target, M. (2000), Playing with reality III: The persistence of dual psychic reality in borderline patients. *International Journal of Psycho-Analysis*, 81, 853-874.

Fonagy, P. Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., Target, M. & Gerber, A. (1996). The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting and Clinical Psychology*, 64(1), 22-31.

Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2002). *Affect Regulation, Mentalization and the Development of the Self*. New York: Karnac Books.

Fonagy, P., Target, M., Gergely, G., Allen, J. G., & Bateman, A. W. (2003). The developmental roots of borderline personality disorder in early attachment relationships: A theory and some evidence. *Psychoanalytic Inquiry*, 23(3), 412-459.

Ghossain (2014). The role of reflective functioning in mediating the relationship between attachment style and psychopathology (unpublished doctoral dissertation). University College London, UK.

Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of educational research*, 42, 237-288.

Goodman, M., Weiss, D. S., Ma, V. M., New, A., Koenigsberg, H., Silverman, J. M., & Siever, L. (2003). The relationship between pathological dissociation, self-Injury and childhood trauma in patients with personality disorders using taxometric analyses. *Journal of Trauma & Dissociation*, 4, 37–41.

Grande, T., Rudolf, G. & Oberbracht, C. (1998). Die Strukturachse der Operationalisierten Psychodynamischen Diagnostik (OPD): forschungsergebnisse

zum konzept und zur klinischen anwendung [The structure axis of Operationalized Psychodynamic Diagnosis (OPD): research findings on its concept and clinical application]. *Persönlichkeitsstörungen,* 2, 173-182.

Grande, T., Schauenburg, H., & Rudolf, G. (2002). Zum Begriff "Struktur" in verschiedenen Operationalisierungen. Ein empirischer Vergleich der "Scales of Psychological Capacities" und der "Operationalisierten Psychodynamis- chen Diagnostik" [Different operationalizations of the concept of "structure": An empirical comparison of the "Scales of Psychological Capacities" and the "Operationalized Psychodynamic Diagnosis"]. In G. Rudolf, T. Grande, & P. Henningsen (Eds.), *Die Struktur der Pers¨ onlichkeit: Vom theoretischen Verst¨ andnis zur therapeutischen Anwendung des psychodynamischen Strukturkonzepts* (pp. 177–196). Stuttgart, Germany: Schattauer.

Igarashi, H., Hasui, C., Uji, M., Shono, M., Nagata, T., & Kitamura T (2010). Effects of child abuse history on borderline personality traits, negative life events, and depression: a study among a university student population in Japan. *Psychiatry Research,* 180, 120–125.

Irwin, H.J. (1994). Proneness to dissociation and traumatic childhood events. *Journal of Nervous and Mental Disease*, 182, 456-460.

Kemperman, I., Russ, M. J., Clark, W. C., Kakuma, T., Zanine, E., & Harrison, K. (1997). Pain assessment in self-injurious patients with borderline personality disorder. *Psychiatry Research,* 70, 175-183.

Kernberg, O. F. (1975). *Borderline conditions and pathological narcissism*. Northvale, NJ: Jason Aronson.

Kernberg, O. F. (1981). Structural interviewing. *Psychiatric Clinics of North America*, 4, 169–195.

Kernberg, O. F. (1984). *Severe personality disorders: Psychotherapeutic strategies*. New Haven, CT: Yale University Press.

Kernberg, O. F. (1996). A psychoanalytic theory of personality disorders. In J. F. Clarkin & M. F. Lenzenweger (Eds.), *Major theories of personality disorder* (pp. 106 –140). New York: Guilford Press.

Kihlstrom, J. F., Glisky, M. L., & Angiulo, M. J. (1994). Dissociative tendencies and dissociative disorders. *Journal of Abnormal Psychology*, 103, 117-124.

Korzekwa, M. I., Dell, P. F., Links, P. S., Thabane, L., & Fougere, P. (2009). Dissociation in borderline personality disorder: A detailed look. *Journal of Trauma & Dissociation : The Official Journal of the International Society for the Study of Dissociation* (ISSD), 10, 346–67.

Leichsenring, F., Leibing, E., Kruse, J., New, A. S., & Leweke, F. (2011). Borderline personality disorder. *Lancet*, 377(9759), 74-84.

Lenzenweger, M. F., & Cicchetti, D. (2005). Toward a developmental psychopathology approach to borderline personality disorder. *Development and Psychopathology*, 17, 893–8.

Lieb, K., Zanarini, M. C., Schmahl, C., Linehan, M. M., & Bohus, M. (2004). Borderline personality disorder. *Lancet*, 364(9432), 453–61.

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

Linehan, M. M. (1989). Cognitive and behavior therapy for borderline personality disorder. *Review of psychiatry*, 8, 84-102.

Links, P. S., Steiner, M., Offord, D. R., & Eppel, A. (1988). Characteristics of borderline personality disorder: A Canadian study. *Canadian Journal of Psychiatry*, 33, 336-340.

Little, T. D. (2013*). Longitudinal structural equation modeling*. New York, NY: Guilford.

Livesley, W. J. (1998). Suggestions for a framework for an empirically based classification of personality disorder. *The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie*, 43, 137–147.

Livesley, W. J., Jang, K. J., & Vernon, P. A. (1998). Phenotypic and genetic structure of traits delineating personality disorder. *Archive of General Psychiatry*, 55, 941-948.

Lyons–Ruth, K., & Jacobvitz, D. (1999). Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 550–554). New York: Guilford Press.

Maffei, C., Fossati, A., Agostoni, A., Barraco, A., Bagnato, M., Deborah, D., Namia, C., Novella, L. & Petrachi, M. (1997). Interrater reliability and internal consistency of the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II), version 2.0. *Journal of Personality Disorders, 11*, 279-284.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development*, 50, 66–104.

Mann, A. H, Jenkins, R., Cutting, J. C. & Cown, P. J. (1981). The development and use of a standardized assessment of abnormal personality. *Psychological Medicine*, 11, 839-847.

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., ... & Stout, R. L. (2000). The Collaborative Longitudinal Personality Disorders Study: Baseline Axis I/II and II/II diagnostic co- occurrence. *Acta Psychiatrica Scandinavica*, 102, 256-264.

Moran, P., Leese M., Lee, T., Walters, P., Thornicroft, G. & Mann, A. (2003). Standardised Assessment of Personality Abbreviated Scale (SAPAS): Preliminary validation of a brief screen fro personality disorder. *British Journal of Psychiatry*, 183, 228-232.

Morey, L. C., & Boggs, C. (1991). *Personality assessment inventory* (PAI). Lutz, FL: Psychological Assessment Resources.

Müller, C., Kaufhold, J., Overbeck, G., & Grabhorn, R. (2006). The importance of

reflective functioning to the diagnosis of psychic structure. *Psychology and Psychotherapy: Theory, Research and Practice*, 79, 485–494.

Nijenhuis, E. R., Vanderlinden, J., & Spinhoven, P. (1998). Animal defensive reactions as a model for trauma-induced dissociative reactions. *Journal of Traumatic Stress,* 11, 243–260.

OPD Task Force. (Eds.). (2008). *Operationalized Psychodynamic Diagnosis OPD–2: Manual of diagnosis and treatment planning.* Cambridge, MA: Hogrefe & Huber.

Paris, J., Zweig-Frank, H., & Guzder, J. (1994). Psychological risk factors for borderline personality disorder in female patients. Comprehensive Psychiatry, 35, 301-305.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, 40, 879-891.

Putnam, F. W. (1991). Dissociative phenomena. In A. Tasman & S.M. Goldfinger (Eds.), *American Psychiatric Press review of psychiatry*, Vol. 10 (pp.145-160). Washington, DC: American Psychiatric Press.

Putnam, F. W. (1993). Dissociative disorders in children: behavioral profiles and problems. *Child Abuse and Neglect,* 17, 39-45.

Reich, R. B., Vera, S. C., Marino, M. F., Levin, A., Yong, L., & Frankenburg, F. R. (1997). Reported pathological childhood experiences associated with the development of borderline personality disorder. *American Journal of Psychiatry*, 154, 1101-1106.

Ross, C. A. (2007). Borderline Personality Disorder and Dissociation and Dissociation. *Journal of Trauma & Dissociation*, *8*(1), 71–80.

Ross, C. A., Norton, G. R., & Anderson, G. (1988). The Dissociative Experiences Scale: A replication study. *Dissociation*, 2, 21-25.

Sar, V., Kundakci, T., Kiziltan, E., Yargic, I. L., Tutkun, H., Bakim, B., … & Özdemir, Ö.2003). The Axis-I dissociative disorder comorbidity of borderline personality disorder among psychiatric outpatients. *Journal of Trauma and Dissociation*, 4, 119–136.

Schauenburg, H., & Grande, T. (2011). Interview measures of interpersonal functioning and quality of object relations: The Operationalized Psychodynamic Diagnosis. In L. M. Horowitzand & S. Strack (Eds.) *Handbook of interpersonal psychology: teory, research, assessment and therapeutic interventions* (pp. 343-356). Hoboken, NJ: John Wiley & Sons.

Shearer, S. L. (1994). Dissociative phenomena in women with borderline personality disorder. *American Journal of Psychiatry*, 151, 1324-1328.

Shedler, J., & Westen, D. (2004). Refining personality disorder diagnoses: Integrating science and practice. *American Journal of Psychiatry*, 161, 1350–1365.

Simeon, D., Nelson, D., Elias, R., Greenberg, J., & Hollander, E. (2003). Relationship of personality to dissociation and childhood trauma in borderline personality disorder. *CNS Spectrums*, 8, 755–757, 760–762.

Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The borderline diagnosis: I. Psychopathology, comorbidity, and personality structure. *Biological Psychiatry*, 51, 936–950.

Spitzer, C., Barnow S., Freyberger, H. J., & Grabe, H. J. (2006). Recent developments in the theory of dissociation. *World Psychiatry*, 5, 82–86.

Spitzer, C., Michels-Lucht, F., Siebel, U., & Freyberger, H. J. (2002). Die Strukturachse der operationalisierten psychodynamischenDiagnostik (OPD): Zusammenh¨ ange mit soziodemographischen, klinischen und psychopathol- ogischen Merkmalen sowie kategorialen Diagnosen [The axis "structure" of the Operationalized Psychodynamic Diagnostics (OPD): Its relationship with sociodemographic, clinical and psychopathological features as well as categorical diagnoses]. Psychotherapie, Psychosomatik, Medizinische Psy- chologie, 52, 392–397.

Stern, A. (1938). Psychoanalytic investigation and therapy in the borderline group of neuroses. *Psychoanalytic Quarterly*, 7, 467–489.

Torgersen, S. (2009). Prevalence, sociodemographics, and functional impairment. In: J. M. Oldham, A. E. Skodol, & D. S. Bender (Eds.), *Essentials of Personality Disorders, 1 (pp.* 83–101 . Arlington, VA: American Psychiatric Publishing.

Trull, T. J. (1995). Borderline personality disorder features in nonclinical young adults: 1. Identification and validation. *Psychological Assessment*, 7, 33-41.

Trull, T. J. (2001). Structural relations between borderline personality disorder features and putative etiological correlates. *Journal of Abnormal Psychology*,110, 471-481.

Tyrer, P., & Ferguson, B. (2000). Classification of personality disorder. In P. Tyrer (Ed.), *Personality disorders: Diagnosis, management and course*. Oxford: Butterworth.

Verheul, R., Andrea, H., Berghout, C. C., Dolan, C., Busschbach, J. J., van der Kroft, P. J., ... & Fonagy, P. (2008). Severity Indices of Personality Problems (SIPP-118): development, factor structure, reliability, and validity. *Psychological Assessment*, 20, 23- 34.

Waller, N. G., & Ross, C. A. (1997). The prevalence and biometric structure of pathological dissociation in the general population: Taxometric and behavior genetic findings. *Journal of Abnormal Psychology*, 106, 499–510.

Waller, N. G., Putnam, F. W., & Carlson, E. B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods*, 3, 300-321.

Wallerstein, R. S. (1991). Assessment of structural change in psychoanalytic therapy and research. *Journal of the American Psychoanalytic Association*, 36(Suppl.), 241–261.

Westen, D., & Shedler, J. (1999). Revising and assessing Axis II, Part 1: Developing a clinically and empirically valid assessment method. *American Journal of Psychiatry*, 156, 258–272.

Westen, D., Gabbard, G. O., & Blagov, P. (2006). Back to the future. Personality structure as a context for psychopathology. In R. F. Krueger & J. L. Tackett (Eds.),

Personality and psychopathology (pp. 335–384). New York, NY: Guilford.

Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: Shifting to a dimensional model. *American Psychologist*, 62, 71–83.

Zanarini M. C., Frankenburg, F. R., Reich, D. B., Silk, K. R., Hudson, J. I., & McSweeney, L. B. (2007). The subsyndromal phenomenology of borderline personality disorder: A 10-year follow-up study. *American Journal of Psychiatry*, 164, 929–35.

Zanarini, M. C., Frankenburg, F. R., Jager-Hyman, S., Reich, D. B., & Fitzmaurice G. (2008). The course of dissociation for patients with borderline personality disorder and axis II comparison subjects: a 10-year follow-up study. *Acta Psychiatrica Scandinavica*, 118, 291–296.

Zanarini, M. C., Gunderson, J. G., Marino, M. F., Schwartz, E. O., & Frankenburg, F. R. (1989). Childhood experiences of borderline patients. *Comprehensive psychiatry*, 30(1), 18-25.

Zanarini, M. C., Ruser, T. F., Frankenburg, F. R., Hennen, J., & Gunderson, J. G. (2000). Risk factors associated with the dissociative experiences of borderline patients. *Journal of Nervous and Mental Disease*, 188, 26–30.

Zimmermann, J., Ehrenthal, J. C., Cierpka, M., Schauenburg, H., Doering, S. & Benecke, C. (2012). Assessing the level of structural integration using Operationalized Psychodynamic Diagnosis (OPD): Implications for DSM–5. *Journal of Personality Assessment*, 1–11.

Zittel Conklin, C., & Westen, D. (2005). Borderline person- ality disorder in clinical practice. *American Journal of Psychiatry*, 162, 867–875.

Zweig-Frank, H., Paris, J. & Guzder, J. (1994a). Dissociation in female patients with borderline and non-borderline personality disorders. *Journal of Personality Disorders*, 8, 203-209.

Zweig-Frank, H., Paris, J. & Guzder, J. (1994b). Dissociation in male patients with borderline and non-borderline personality disorders. *Journal of Personality Disorders*, 8,210-218.

Part 3: Critical Appraisal

1. Introduction

The process of writing the literature review and empirical paper revealed theoretical as well as methodological issues in the study of borderline personality disorder (BPD). These issues are reviewed here with consideration of the context of the study and its design. This paper discusses the heterogeneity of BPD diagnosis, as reviewed in the literature and demonstrated in the sample recruited for the research project. The limited knowledge on dissociative symptoms and its implications for this thesis are considered. Furthermore, the variability in the operationalization of personality structure across theoretical modalities is discussed. The paper also explores the challenges that arose while carrying out this project and how these were resolved. Finally, conclusions from completing this dissertation and recommendations for future studies are proposed.

2. Context of the research

The study of personality structure and dissociation in BPD population attracted me based on my prior interest and clinical work with this client group. Before moving to the UK and starting my training I worked with women diagnosed with BPD in a therapeutic community in Israel. Dissociative episodes were very common amongst these women and often left staff feeling unskilled in effectively supporting patients in these moments. Although most of these women reported very difficult life experiences, trauma was not necessarily detected in all these cases and on the other hand history of trauma did not always predict the occurrence of dissociative symptoms. This made me

curious about the impact of trauma on dissociation in BPD. By researching this area I hoped to increase my knowledge of this serious and perplexing disorder.

Working on this project provided me with an opportunity to improve my understanding of common clinical hallmarks of BPD patients and theoretical models for formulating the difficulties that are characteristic of this client group. Through this I hoped not only to contribute to the literature on BPD, but also improve my clinical skills with these patients. Using a newly developed measure that is based on psychodynamic theories of personality organization offered me the opportunity to learn about theories of personality structure and organization that can be utilized when offering therapy from any theoretical framework. This also taught me about the process of establishing the psychometric properties of a newly translated measure.

In the process of conducting this research I also got the opportunity to work in an inpatient unit for adolescents specializing in emerging personality disorder (PD). This service was also planned to be one of the recruitment sites for the adolescent sample of the study. Although my study focused on adult patients, my clinical experience provided me with a wider perspective on the developmental trajectory of the disorder. I was also able to rely on the knowledge that I have gained from carrying out my research and literature review to improve my clinical work. Learning about the characteristics of BPD and its etiology increased my awareness of possible risk factors that my patients may present with. My clinical experience in turn contributed to my research, as it helped me improve my engagement skills with the participants of the study. Working there also gave me the opportunity to help promote the study and recruitment from that site, as we were not receiving many referrals for adolescents at the time.

3. Theoretical and methodological issues

1.1. Heterogeneity of BPD diagnosis

The large heterogeneity in this client group was evident in the study. This research highlighted the issues of extreme variability in the diagnosis of BPD. As previously discussed, it is highly common for BPD patients to meet criteria for co-morbid mood disorders, substance misuse, eating disorders, post-traumatic stress disorder and other personality disorders (PD; McGlashan et al., 2000). Accordingly more than half of the BPD sample recruited to this study scored above the above the cut off score of the Structured Clinical Interview for Axis II disorders (SCID-II; First, Spitzer, Gibbon, & Williams, 1996) meeting criteria for two or more PDs. Furthermore the standard deviation of the BPD group on all symptom severity measures and BPD features was larger than that found in the control sample, indicating of greater variability. This was also evident in the reports of dissociation and structural integration profile, with some participants scoring in the severe range while others were in the mild to moderate range. Reported history of childhood abuse was also diverse across the BPD sample. Millon (1987) showed that BPD patients reported highly varied childhood histories, which suggests that BPD can be reached via a number of developmental pathways. The large heterogeneity in this diagnosis has led to rising focus on developing more accurate diagnostic systems that will reflect the dimensional nature of personality characteristics (Zimmermann et al., 2012).

Skodol et al. (2002) discuss the problem of phenotypic categorization of this disorder. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American

Psychiatric Association [APA], 2013) focuses on observable phenomena, leaving little place for other approaches to diagnosis, such as psychological test performance, social functioning and defense mechanisms. For a definite diagnosis the DSM-5 requires five out of nine symptoms and four for a probable diagnosis (APA, 2013). This system has created a scenario in which two people that meet the threshold might present very differently in practice. The breadth of literature I reviewed in the process of completing this dissertation demonstrated the downfalls of a categorical diagnostic system. The range of severities and variability of symptoms created very heterogeneous samples in most studies.

The large clinical variability has led to efforts to try and identify latent variables within the diagnosis of BPD that are common in this client group and differentiate it from other disorders (Gunderson & Kolb, 1978; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Skodol et al., 2002). The evidence for the benefits of dimensional classification is slowly growing. When starting this project it was originally thought that the new version of the DSM-5 (APA, 2013) would revolutionize the diagnosis of personality disorder (Widiger, Simonsen, Sirovatka & Regier, 2006). The new version was expected to introduce a hybrid model of dimensional and categorical classification with a personality functioning scale (Morey et al., 2011). This shift in the diagnostic classification was expected to significantly increase the need for multidimensional assessment measurements, such as the OPD-SQ. However this did not meet the approval of the APA and Section II of the manual remained largely unchanged (APA, 2013). The new model was redirected to Section III, which includes useful measures and techniques for enhancing clinical decision-making. Although the DSM does not require a

dimensional assessment to diagnose PD, it is becoming gradually more accepted as the criticism for the arbitrary thresholds for diagnosis for most personality disorders is rising (Skodol et al., 2002). This study shows that the OPD-SQ can be a reliable and easy to use measure to supplement the assessment of PD. I would be interested in further developing this measure to promote its use in clinical and research settings.

1.2. Assessment of personality structure

In the process of reviewing psychological theories of BPD I experienced some confusion regarding the definition of personality structure. Although there seems to be an agreement across theoretical modalities that personality organization shapes the individual's experiences and their actions and that this is highly influenced by social developmental environment, the operationalization of this construct appeared to vary between theoretical frameworks and different measures. Current conceptualization of personality structure encompasses a range of functional domains, including affective, cognitive and self- regulatory capacities, quality of self-other representations and the ability to build and maintain meaningful relationships (Zimmermann et al., 2012). All models of personality structure converge on the view that the degree of functional impairment lies on a continuum that can be divided into several prototypical levels.

The Operationalized Psychodynamic Diagnosis (OPD), suggests that personality structure is composed of six dimensions (e.g. self-perception, self-regulation, defense, object perception, communication, and attachment). This is closely related to Kernberg's (1984) model of personality organization, which identifies three key ego functions that capture personality functioning, including identity formation, defenses, and reality

testing. The five-factor model (FFM; Costa & Widiger 1994), which relies on a growing evidence base defines personality across five broad personality domains. Other models of personality functioning include the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley, & Vernon, 1998), the Schedule for Nonadapative and Adaptive Personality (SNAP; Clark, 1993), the Temperament and Character Inventory (TCI; Cloninger, Svrakic, & Przybeck, 1993) and the Shedler-Westen Assessment Procedure (SWAP-200; Westen & Shedler, 1999a, 1999b). Table 1 summarises the dimensions of personality as defined by these models. The differences in definition of personality structure between measures makes it hard to compare the findings of this research to other studies using different instruments. Although this study relies mostly on the psychodynamic conceptualization of personality structure, I believe its findings are still highly relevant for all therapeutic orientations. Skodol et al. (2002) propose that despite differences in the theoretical basis and development methods of each model, there is a substantial overlap in the domains of functioning assessed. Further studies are needed, to identify commonalities and differences of various existing measures of PD severity (Crawford, Koldobsky,Mulder, & Tyrer, 2011).

Table 1. Dimensional models of personality structure

OPD-SQ	SNAP	DAPP-BQ	TCI	FFM	SWAP-200
Self perception	Mistrust	Compulsivity	Novelty seeking	Neuroticism	Psychological health
Object perception	Manipulation	Conduct problems	Harm avoidance	Etraversion	Psychopathy
Self-regulation	Aggression	Diffidence	Reward dependence	Openness	Hostility
Object relations	Self-harm	Identity problems	Persistence	Agreeableness	Narcissism
Inward emotional communication	Eccentric perceptions	Insecure attachment	Self directedness	Conscientiousness	Emotional dysregulation
External emotional communication	Dependency	Intimacy problems	Cooperativeness		Dysphoria
Internal attachment	Exhibitionism	Narcissism	Self-transcendence		Schizoid orientation
External attachment	Entitlement	Suspiciousness			Obsessionality
	Detachment	Affective liability			Thought disorder
	Impulsivity	Passive opposition			Oedipal conflict
	Propriety	Cognitive distortion			Dissociated
	Workaholism	Rejection			Sexual conflict
		Self-harm behaviors			
		Restricted expression			
		Social avoidance			
		Stimulus seeking			
		Interpersonal disesteem			
		Anxiousness			

Note: OPD-SQ= Operationalised Psychodynamic Diagnosis-Structure Questionnaire; SNAP= Schedule for Nonadaptive and Adaptive Personality; DAPP-BQ=Dimensional Assessment of Personality Pathology-Basic Questionnaire; TCI=Temperament and Character Inventory; FFM=Five-Factor Model; SWAP-200=Schedler-Westen Assessment Procedure.

1.3. Current knowledge on dissociation in BPD

Improving understanding of dissociative symptoms in BPD was the main aim of this dissertation. Dissociation is the most common cognitive symptom of BPD along with paranoid ideation (Gunderson & Kolb, 1978; Skodol et al., 2002). Accordingly transient stress-related dissociative experiences have been added to the diagnostic criteria since the publication of the DSM-IV (APA, 1994). Studies have consistently found that dissociation is significantly more common in BPD pateints compared to healthy controls, other personality disorders and general psychiatric patients (Herman, Perry, & Van der Kolk, 1989; Ross, 2007; Simeon, Nelson, Elias, Greenberg, & Hollander, 2003; Zanarini et al., 2000). Despite its high prevalence in this client group I found that studies in this area were quite hard to find compared to other diagnostic criteria of BPD (e.g. affective instability, recurrent suicidal behaviour). This was most likely due to limited literature available about dissociation specifically in BPD (Stiglmayr, Shapiro, Stieglitz, Limberger, & Bohus, 2001). The lack of sufficient understanding of dissociation in BPD encouraged me to focus my thesis on this area.

Ross (2007) points to the lack of clear guidelines to help clinicians determine when dissociative symptoms can be subsumed under the BPD crtieria or warrant a co-morbid Axis I dissociative disorder diagnosis. The limited literautre in this area and the ambiguity about the characteristics of dissociation in BPD was evident in the process of conducting my literature review. A very small number of RCTs measured dissociation in their outcome measures battery (9 out of a total of 36 papers identified). The majority of efficacy studies included in my review assessed dissociation as a secondary outcome with minimal discussion about the findings (e.g. a few studies only reported the baseline

and outcome scores without discussing these). This led me to include prospective studies in the review to gain a better understanding of the therapy effectiveness for dissociative symptoms.

The ambiguous diagnostic criteria might partially explain the great variability in dissociative symptoms reported in this client group. Many studies I read did not differentiate between pathological and non-patholol gical dissociation. Most of the studies included in the literature review and the majority of papers I read to gain a background understanding of dissociation in BPD used screening self-report questionnaires rather than more comprehensive measures, such as the Structured Clinical Interview for DSM–IV Dissociative Disorders- Revised (SCID-D-R; Steinberg, 1994) or psychobiological measures (e.g. skin conductance). Testing the validity of the findings of the empirical paper using more comprehensive dissociative measures is also required.

Although dissociation is highly common in BPD patients, the degree of severity varies significantly. While some might present with severe symptoms of dissociation meeting criteria for comorbid dissociative disorder (DD), others might experience dissociative symptoms that do not reach the clinical threshold (Conklin & Westen, 2005; Goodman et al., 2003; Korzekwa, Dell, Links, Thabane & Fougere, 2009; Ross, 2007; Sar et al., 2003). The distinction between these two subgroup is crucial, as their sypotms are likely to have an impact on their presentation in services and their prognosis (Korzekwa et al., 2009). When conducting my literature review I chose not to use the term ‘dissociative disorder’, as I found it yielded mostly studies that assessed therapy outcome for DD rather than BPD. I also considered exlcuding papers that did not distinct between these two subgroups, as they are likely to respond differently to treatment (Sar

& Ross, 2006). The majority of my studies excluded participants with co-morbid DD. Due to the limited literature I found on treatment outcomes of dissociation I decided to include papers that did not report screening for DD. I thought this compromise will allow a more comprehensive and informative review of the efficacy of therapy for BPD in reducing dissociation, despite not clearly controlling for dissociation severity. Future studies should consider assessing dissociation severity and clearly distinguishing between pariticipants presenting with and without co-morbid DD.

4. Challenges

One of the main advantages of working with a well-resourced study was that it allowed access to a much larger sample that would have been very difficult to recruit otherwise in the time frame I had. Working with leading researchers and having the support of a large research team made recruitment a much easier process. This allowed me to focus on the assessment of participants while other members of the team managed the referrals and promoted recruitment. The study recruited from multiple sites across London, which minimized the risk of a biased sample. However, recruiting a matched control sample was more challenging than initially anticipated. As mentioned in the empirical paper, the groups differed significantly on various demographic variables, including gender, educational level and household income. Although this was to be expected based on previous findings of correlates of PD (Coid, Yang, Tyrer, Roberts & Ullrich, 2006), it was a concern that this will confound the results. To minimize risk of confounds, key demographic variables that correlated with the measures of interest were controlled for such as, age, household income and educational level.

Participants were assessed in their local service. This was normally a facility that they were familiar with. This was not only convenient for the participants, but also might have helped reduced the anxiety of an unknown situation. However, the downside of this was that the assessment site was not entirely neutral, as the majority of participants were likely to have formed associations with the service based on past experiences there or in other services. This had the potential of influencing their performance. Participants were often unsure about the link between the service and the research team. This was clarified before starting the assessment, ensuring participants that the data will remain anonymous. Another implication of conducting the assessments in participants' local services was that this meant that assessors were not blind to the sample allocation. This could have potentially influenced the assessment, which is particularly relevant for the interview-based measures (e.g. SCID-II). From a technical perspective performing the assessments on different sites meant that the assessment rooms were not always suitably designed. On many occasion the assessors would have to sit in the room quietly with the participants, due to lack of space in clinics. This might have also had an impact on participants' responses.

Studying structural integration using the English version of the OPD-SQ was one of the objectives of the empirical paper. I saw this as an exciting opportunity to take part in developing a very promising and interesting measure. However this was also a challenge of the study. Because this was a new measure there was very little literature in English to rely on. The fact that it was the first version in the English language meant that it had not had the opportunity of being perfected after a few revisions. Unfortunately we discovered half way through recruiting the sample that the wording of the questions

required a few adjustments. Although these were just minor adjustments the difference between the versions was statistically significant. In hindsight it might have been better to test out the questionnaire more and evaluate the translation more carefully prior to starting recruitment. Perhaps if there was more time and resources participants could have been contacted to ask to recomplete the questionnaire. However it was thought this would raise another series of confounders (e.g. different time points of assessments) and therefore after discussing this with my research supervisor it was decide to control for the change in versions while conducting the analysis. Replicating studies administering only the latest version of the questionnaire are required to test the validity of this study.

Another central challenge of the study was the length of the assessment. The data for this study was collected under the recruitment of a larger research project that included a long battery of behavioral tasks, self-report measures and interview assessments. Due to the multitude of measures the assessment had to be conducted over two 4-hour sessions. Although participants were mostly very patient and keen to volunteer their time, it was understandably difficult to sustain an equal level of concentration for such a long period of time. This was a main consideration when designing the sequence of tasks in the assessment, trying to achieve a balance between level of complexity of the tasks and the emotional involvement it required from the individual. Participants were frequently encouraged to take a few refreshment breaks and inform the researcher if they prefer to cut the assessment short. On a few occasion it led to participants not completing the full assessment pack. However this occurred only in about 5% of the sample.

The study also included interview measures (e.g. SCID-II) that required asking participants very personal questions that can potentially trigger unpleasant memories and distress. From my experience participants were often surprisingly trusting of the interviewer and were remarkably open to discussing difficult events in their lives. I found participants' willingness to share their experiences very inspiring. I also noticed that as participants' trust in me grew they started to share more of themselves with me. This would have been suitable if I was seeing them in a therapeutic setting, but not in a research context. This placed me in an uncomfortable position at times, as I had to remind participants that although we discussed very personal issues and started to develop a relationship we would not be meeting again after completing the assessment. I often encouraged participants to turn to their team for further support and assessed risk before completing the assessment. All participants were given contact numbers for help lines and clinicians to contact in case of crisis following the assessment. They were also provided with a handout with relaxation exercises to help reduce anxiety and distress that might have been induced by the study (Appendix 12).

5. Conclusions

The process of completing this thesis has taught me a great deal about BPD, as well as how to plan, conduct and analyze results of a non-experimental research. There are a number of learning points that can be drawn from this study. The diagnostic classification of BPD should be further developed to characterize BPD in a more sensitive and specific manner. The dimensional assessment of personality structure appears to be promising. However this requires further research to establish its reliability and validity. The literature review and empirical paper point to the need to improve

understanding of dissociation, as a symptom of BPD. The study of dissociation requires further development and improvement. A more detailed description and guidelines for assessment can help identify the characteristic of dissociation in BPD. This could inform psychological interventions for this client group to maximize therapy efficacy.

References

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders: DSM- IV*. (4th ed). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Clark, L. A. (1993). *Manual for the Schedule for Nonadaptive and Adaptive Personality* (SNAP). Minneapolis, MN: University of Minnesota Press.

Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archive of General Psychiatry*, 50, 975–990.

Coid, J., Yang, M., Tyrer, P., Roberts, A., & Ullrich, S. (2006). Prevalence and correlates of personality disorder in Great Britain. *The British Journal of Psychiatry*, 188, 423-431.

Conklin, C.Z. & Westen, D. (2005). Borderline personality disorder in clinical prac- tice. *American Journal of Psychiatry*, 62, 867-875.

Costa, P. T., Widiger, T. A., editors (1994). *Personality Disorders and the Five-Factor Model of Personality*. Washington, DC: American Psychological Association.

Crawford, M. J., Koldobsky, N., Mulder, R., & Tyrer, P. (2011). Classifying personality disorder according to severity. *Journal of Personality Disorders*, 25, 321–330.

First, M. B., Gibbon M., Spitzer R. L., Williams, J. B. W. & Benjamin, L.S. (1997). *Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II).* Washington, D.C.: American Psychiatric Press, Inc.

Goodman, M., Weiss, D. S., Mitropoulou, V., New, A., Koenigsberg, H., Silverman, J. M., & Siever, L. (2003). The relationship between pathological dissociation, self-injury and childhood trauma in patients with personality disorders using taxometric analyses. *Journal of trauma & dissociation*, 4, 65-88.

Gunderson, J. G., & Kolb, J. E. (1978). Dicriminating Features of Borderline Patients. American Journal of Psychiatry, 135, 792–796.

Herman, J. L., Perry, J., & Van der Kolk, B. A. (1989). Childhood trauma in borderline personality disorder. *American Journal of Psychiatry*, 146, 490–495.

Kernberg, O.F. (1984). *Severe personality disorders*. New Haven: Yale University Press.

Korzekwa, M. I., Dell, P. F., Links, P. S., Thabane, L., & Fougere, P. (2009). Dissociation in borderline personality disorder: A detailed look. *Journal of Trauma & Dissociation : The Official Journal of the International Society for the Study of Dissociation (ISSD)*, *10*, 346–67.

Lieb, K., Zanarini, M. C., Schmahl, C., Linehan, M. M., & Bohus, M. (2004). Borderline personality disorder. *Lancet*, 364, 453–61.

Livesley, W. J., Jang, K. L., & Vernon, P. A. (1998). Phenotypic and genetic structure of traits delineating personality disorder. Archive of General Psychiatry, 55,941–948.

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., ... & Stout, R. L. (2000). The Collaborative Longitudinal Personality Disorders Study: baseline Axis I/II and II/II diagnostic co- occurrence. *Acta Psychiatrica Scandinavica*, 102, 256-264.

Millon, T. (1986). A theoretical derivation of pathological personalities. In T. Millon & G. L. Klerman (Eds.), *Contemporary directions in psycho- pathology: Toward the DSM-IV* (pp. 639–669). New York: Guilford Press.

Morey, L. C., Berghuis, H., Bender, D. S., Verheul, R., Krueger, R. F., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM–5, Part II: Empirical articulation of a core dimension of personality pathology. *Journal of Personality Assessment*, 93, 347–353.

Ross, C. A. (2007). Borderline Personality Disorder and Dissociation and Dissociation. *Journal of Trauma & Dissociation*, *8*, 71–80.

Sar, V., Kundakci, T., Kiziltan, E., Yargic, I. L., Tutkun, H., Bakim, B., … & Özdemir, Ö.2003). The Axis-I dissociative disorder comorbidity of borderline personality disorder among psychiatric outpatients. *Journal of Trauma and Dissociation*, 4, 119–136.

Sar, V., & Ross, C. (2006). Dissociative disorders as a confounding factor in psychi-atric research. *Psychiatric Clinics of North America*, 29, 129–144.

Simeon, D., Nelson, D., Elias, R., Greenberg, J., & Hollander, E. (2003). Relationship of personality to dissociation and childhood trauma in borderline personality disorder. *CNS Spectrums*, 8, 755–757, 760–762.

Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The Borderline Diagnosis I: Psychopathology , comorbidity, and personality structure. *Biological psychiatry*, 51, 936-950.

Stiglmayr, C. E., Shapiro, D. A., Stieglitz, R. D., Limberger, M. F., & Bohus, M. (2001). Experience of aversive tension and dissociation in female patients with borderline personality disorder-a controlled study. *Journal of Psychiatric Research*, 35, 111–118.

Westen, D., Shedler, J. (1999a). Revising and assessing Axis II, Part I: Developing a clinically and empirically valid assessment method. *American Journal of Psychiatry* 156, 258–272.

Westen, D., & Shedler, J. (1999b). Revising and assessing Axis II, Part II: Toward an empirically based and clinically useful classification of personality disorders. *American Journal of Psychiatry*, 156, 273–285.

Widiger, T. A., Simonsen, E., Sirovatka, M. S. & Regier, D. A. (2006). *Dimensional models of personality disorders. Refining the research agenda for DSM-V*. Washington: American Psychiatric Association.

Zanarini, M. C., Ruser, T. F., Frankenburg, F. R., Hennen, J., & Gunderson, J. G. (2000). Risk factors associated with the dissociative experiences of borderline patients. *Journal of Nervous & Mental Disorders*, 188, 26–30.

Zimmermann, J., Ehrenthal, J. C., Cierpka, M., Schauenburg, H., Doering, S. & Benecke, C. (2012). Assessing the level of structural integration using Operationalized Psychodynamic Diagnosis (OPD): Implications for DSM–5. *Journal of Personality Assessment*, 1–11.

Appendix 1: Quality of practice-based evidence checklist

Reporting Yes = 1 No = 0 Unable to determine = 0			
1	Is the hypothesis/aim/objectives of the study clearly described	☐	
2	Are the main outcomes to be measured clearly described in the introduction or methods section	☐	If the main outcomes are first mentioned in the results section, the question should be answered No
3	Are the characteristics of the clients included in the study clearly described	☐	Inclusion and/or exclusion criteria should be given. Emphasis on inclusion and exclusion criteria, other characteristics are age/gender/morbidity
4	Are the interventions/treatments of interest clearly described?	☐	Treatments and placebo (where relevant) that are to be compared should be clearly described
5	Are the distributions of principal confounders in each group of clients to be compared (or within a single group) clearly described?	☐	A list of principal confounders is provided. Morbidity, co-morbidity, age, gender, previous history. Good qual will include adjustment regression or matching
6	Are the main findings of the study clearly described?	☐	Simple outcome data (including denominators and numerators) should be reported for all major findings so that the reader can check the major analyses and conclusions. This question does not cover statistical testes which are considered below
7	Does the study provide estimates of the random variability in the data for the main outcomes?	☐	In non normally distributed data the inter-quartile range of results should be reported. In normally distributed data the standard error, standard deviation, or confidence intervals should be reported. If the distribution of the data is not described, it must be assumed that the estimates used were appropriate and the question should be answered yes
8	Have all the important adverse events that may be a consequence of the intervention/treatment been reported?	☐	This should be answered yes if the study demonstrates that there was a comprehensive attempt to measure adverse events (A list of adverse events is provided). E.g. early discontinuation of therapy
9	Have the characteristics of clients lost to follow-up been described?	☐	This should be answered yes where there were no losses to follow-up or where losses to follow-up were so small that findings would be unaffected by their inclusion. This should be answered no where a study does not report the number of patients lost to follow-up. Follow − up = post − therapy, or loss from study at baseline

Reporting Yes = 1 No = 0 Unable to determine = 0			
10	Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.01	☐	
11	Have sufficient data been provided to enable calculation of outcomes such as pre–post ESs, estimates of reliable a nd clinically significant change	☐	If data are provided to enable calculation of any one of these outcomes score the question yes

External valitity/clinical representativeness Yes = 0 No = 0 Unable to determine = 0			
12	(a) Were the clients asked to participate in the study representative of the entire population from which they were recruited	☐	The study must identify the source population for clients and describe how the patients were selected. Clients would be representative if they comprised the entire source population, an unselected sample of consecutive clients, or a random sample. Random sampling is only feasible where a list of all members of the relevant population exists. Where a study does not report the proportion of the source population from which the patients are derived the question should be answered as unable to determine
	(b) Were clients referred through usual clinic routes	☐	
13	Were those clients who were prepared to participate representative of the entire population from which they were recruited?	☐	The proportion of those asked who agreed should be stated. Validation that the sample was representative would included demonstrating that the distribution of the main confounding factors was the same in the study sample and the source population
14	(a) Were client heterogeneous in personal characteristics	☐	
	(b) Were clients heterogeneous in terms of presenting problems	☐	
15	(a) Were the staff, places, facilities where the patients were treated representative of the treatment the majority of patients receive?	☐	For the question to be answered yes the study should demonstrate that the intervention was representative of that in use in the source population
	(b) Was the treatment conducted in a non university setting	☐	The question should be answered no if, for example, the intervention was undertaken in a specialist centre unrepresentative of the hospitals most of the source population would attend
	(c) Was implementation of treatment monitored (R)	☐	

External valitity/clinical representativeness Yes = 0 No = 0 Unable to determine = 0		
16	Were therapists experienced, professionals with regular caseloads	☐
17	Were therapists free to use a wide variety of procedures in treatment and not just limited to one treatment procedure	☐
18 (R)	Were therapists trained immediately before the study and in the specific treatment being studied	☐

Internal reliability Yes = 1 No = 0 Unable to determine = 0		
19	If any of the results of the study were based on 'data dredging' was this made clear	☐ Any analysis that had not been planned at the outset of the study should be clearly indicated. If no retrospective unplanned subgroup analysis were reported, then answer yes
20	Were the statistical tests used to assess the main outcomes appropriate	☐ The statistical techniques used must be appropriate to the data. For example, non parametric methods should be used for small sample sizes. Where little statistical analysis has been undertaken, but where there is no evidence of bias, the question should be answered yes. If the distribution of the data (normal or not) is not described it must be assumed that the estimates used were appropriate and the question should be answered yes
21	Was the compliance with the intervention/s/treatments reliable?	☐ Where there was non compliance with the allocated the question should be answered no
22	Were the main outcome measures used accurate (valid and reliable)	☐ For studies where the outcome measures are clearly described, the question should be answered yes. For studies which refer to other work or that demonstrates the outcome measures are accurate, the question should be answered yes
23	Do the analyses adjust for different lengths of follow-up of patients in different treatment groups?	☐ Where no comparison group score 0. Where lengths of follow-up the same score 1

Appendix 2: List of abbreviations

AAQ= Acceptance and Action Questionnaire

BPDSI-IV= Borderline Personality Severity Index-IV, measures dissociation and paranoid ideation

CAT=cognitive analytic therapy

CSI= clinically significant improvement

CT= controlled trial

DBT= dialectical behavioral therapy

DDP= dynamic deconstructive therapy

DES= Dissociative Experience Scale

DES=Dissociative Experience Scale

DES-II= Dissociative Experiences Scale II

DES-T=DES-Taxon

DSH=deliberate self-harm

ITT= intention to treat

MBCT-a= mindfulness based cognitive therapy- adapted

Obs=observational study

OCC= optimized community care

PE= prolonged exposure

PTSD= post-traumatic stress disorder

RCI= reliability of change index

SDQ= Somatoform Dissociation Questionnaire

SFT= schema focused therapy

TAU= treatment as usual

TC=treatment completers

TC=treatment completers

WL=waiting list

Appendix 3: Ethical approval

Part of the research infrastructure for Wales funded by the National Institute for Social Care and Health Research, Welsh Government.
Yn rhan o seilwaith ymchwil Cymru a ariannir gan y Sefydliad Cenedlaethol ar gyfer Ymchwil Gofal Cymdeithasol ac Iechyd, Llywodraeth Cymru

NISCHR

Gwasanaeth Moeseg Ymchwil | RES Research Ethics Service

Research Ethics Committee (REC) for Wales
Sixth Floor, Churchill House
17 Churchill Way
Cardiff CF10 2TW
Telephone : 029 2037 6829
Fax : 029 2037 6824

E-mail : corinne.scott@wales.nhs.uk

Website : www.nres.nhs.uk

09 October 2012

Professor Peter Fonagy
HoD, Department of Clinical, Educational and Health Psychology, UCL
UCL
Gower Street
London WC1N 3BG

Dear Professor Fonagy

Study title: **Probing Social Exchanges – A Computational Neuroscience Approach to the Understanding of Borderline and Anti-Social Personality Disorder**
REC reference: **12/WA/0283**

Thank you for your letter of 25 September 2012, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 05 October 2012. A list of the sub-committee members is attached.

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.

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 "Conditions of the favourable opinion" 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 the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated 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

- *The Clinical / Probation Service information sheet, page two paragraph one, has the phrase "which is a psychiatric interview" twice; one of these instances should be removed;*
- *The word "However" should be removed from the start of the first paragraph of page three under "What are the possible disadvantages and risks of taking part?";*
- *The second paragraph of the same section is the same sentence repeated twice, and one of these instances should be removed;*
- *The Healthy volunteers information page three, the word "However" should be removed from the start of the first paragraph of page three under "What are the possible disadvantages and risks of taking part?"*

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).

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Confirmation should also be provided to host organisations together with relevant documentation.

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

Document	Version	Date
Advertisement	Letter of invitation = advertisement material as well; version 1.1	22 August 2012
Covering Letter	signed Tobias Nolte, Anna Freud Centre	22 August 2012
Evidence of insurance or indemnity	Arthur J Gallagher International certificate of insurance - University College London - expires 01 August 2013	30 July 2012
GP/Consultant Information Sheets	1	22 August 2012
Investigator CV	Professor Fonagy; version 1.1	22 August 2012
Investigator CV	Dr Feigenbaum; version 1.1	22 August 2012
Investigator CV	Tobias Nolte; version 1.1	22 August 2012
Investigator CV	P Read Montague; no version or date	
Letter from Sponsor	signed David Wilson, University College London	21 August 2012
Letter of invitation to participant		22 August 2012
Other: Risk and Safety Protocol	1.1	22 August 2012
Other: Data Protection Form	no version or date	
Other: Additional details regarding MRI data	1.1	22 August 2012
Other: Consent to contact form	1.1	22 August 2012
Participant Consent Form: Healthy volunteers	1.2	
Participant Consent Form: Clinical / Probation service	1.2	
Participant Information Sheet: Genetics	1.1	22 August 2012
Participant Information Sheet: Healthy volunteers	1.2	

Participant Information Sheet: Clinical / Probation service	1.2	
REC application	signed electronically by Professor Fonagy, and electronically by Mr David Wilson, sponsor's representative	21 August 2012
Response to Request for Further Information	signed Dr Nolte	25 September 2012

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

Feedback
You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

12/WA/0283	**Please quote this number on all correspondence**

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

Yours sincerely

pp **Dr Gordon Taylor**
Chairman

Email: corinne.scott@wales.nhs.uk

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments

"After ethical review – guidance for researchers"

Copy to: David Wilson, University College London
Dr Janet Feigenbaum, North East London Foundation Trust

Appendix 4: Joint working statement

This was a joint thesis conducted in partnership with my course mate, Daniel Ghossain and several other members of the research team working on a study directed by Profs. Peter Fonagy and Read Montague (ongoing). We all equally contributed to the study, were fully involved in the study's recruitment, delivery of the intervention and administering the study's assessment battery. The analysis and write up of the thesis were done independently from one another.

Appendix 5: Assessment battery

List of measures

Self report questionnaires completed over two sessions:

- Dispositional Behaviour Questionnaire
- Brief Symptom Inventory (BSI)
- Antisocial Process Screening Device (APSD)
- The Borderline Personality Disorder Features Scale or respective version for Children and Adolecents (BPFSC)
- Inventory of Interpersonal Problems (IIP)
- Self-report Psychopathy Scale
- Schizotypal Personality Questionnaire (SPQ)
- Drugs Alcohol and Self Injury Questionnaire (DASI)
- Structured Assessment of Personality – Abbreviated Scale (SAPAS-AV)
- Childhood Trauma Questionnaire (CTQ)
- Dissociative Experience Scale (DES)
- Post-traumatic Checklist-specific (PCL-S)
- Green et al. Paranoid Thought Scales (GPTS)
- Barret Impulsivity Scale (BIS)
- Other As Shamer Questionnaire
- Reflective Functioning Questionnaire (RFQ54)
- Revised Experience in Close Relationships Questionnaire (ECR-R)
- Operationalised Psychodynamic Diagnostics – Structure Questionnaire (OPD-SQ)
- Autonomous Functioning Index (AFI)
- Difficulties in Emotion Regulation Strategies Scale (DERS)
- Empathy Quotient (EQ)
- Lifetime History or Aggression (LHA)

Computer based behavioral tasks:

- Trust Game-

An interpersonal exchange game in which a player makes a series of decisions to either trust or repay trust in a social partner, typically either a human partner or a computer agent that is programmed to provide human-like responses. The experience of playing the trust task mimics a standard video game, but with simpler icons and images. One player is be designated as the investor, and the other is designated the trustee; the roles remain the same through the entire game session. At the start of each round, the investor is given 20 points and decides how much (between 0-20 points) to invest with the trustee. The number of points invested is tripled and the number kept remains with the investor and cannot be taken away. The trustee, in turn, decides how much to keep and how much to give back to the investor. At the end of each round, the total points earned by each player are added to their respective totals. In order to incentivize performance, subjects are compensated, in part, based on the number of points accumulated across the task.

- Social Hierarchy Task:

An interpersonal exchange game in which two players make decisions that determine which player has control of a monetary endowment ('alpha') and which has no control of monetary endowments ('beta') across a series of interactions. Players in this game play against a computer agent that is programmed to provide human-like responses. The experience of playing the trust task mimics a standard video game, but with simpler icons and images. At the start of each round, the player in the 'alpha' role is given 10

points, a portion of which (0-4 points) can be given to a second player in the 'beta' role. Following this transaction, the player in the 'beta' role can choose to challenge their partner, or not. If the 'beta' player chooses not to challenge, the round is over and the next round begins. If the 'beta' player chooses to challenge, the 'beta' player can spend 1-10 points to 'challenge' their partner, and the 'alpha' player can spend 0-10 points to 'defend' against the challenge. If the number of points used to challenge is greater than the number of points used to defend, the 'beta' player unseats the 'alpha' and becomes 'alpha' in the subsequent round. Should both 'alpha' and 'beta' use the same number of points to defend and challenge, there is a 50% chance that the players switch roles. At the end of each round, the total points earned by each player are added to their respective totals. In order to incentivize performance, subjects are compensated, in part, based on the number of points accumulated across the task.

- The Bargaining Task-

Interpersonal exchange game in which two players make decisions either about selling or buying an imaginary object. The "Seller" has the object, while the other player, "Buyer", wants the object. Each participant played the game both from the buyer's position and the seller's in consecutive rounds. The order of the games was randomized between participants. The buyer is told the value of the object (i.e. the points they will get if they buy the object) at the start of each round and needs to suggest a price (0-10). The seller is only told the price that the buyer suggested and is required to suggest a price based on this. If the seller sets the price lower than the value of the object, then the buyer will buy the object and receive points for getting the object equal to the value of the object minus the price they set for the purchase. If the seller sets the price higher

than the value of the object, the buyer will not receive the object. Participants were not told either the object's actual value or the seller's final price and whether they got/sold the object after each round.

Interview based measures:

- **Narrative-based measures:**
  - Adult Attachment Interview (attachment and Reflective Function)
  - Object Relations Inventory (Differentiation-Relatedness Scale)
- **Diagnostic measures:**
  - Structured Clinical Interview of Axis II Disorders (SCID-II)

Appendix 6: Information and consent form

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Project Title:

Understanding the Social Brain in Healthy Volunteers and People with Psychological Difficulties.

This study has been approved by the Research Ethics Committee for Wales (Project ID): 12/WA/0283.

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you to decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Participant's Statement

I

have read the notes written above and the Information Sheet, and understand what the study involves. I am also aware that I can consent to certain aspects of the study in order to participate in them whereas I can withhold my consent for others parts.

understand that if I decide at any time that I no longer wish to take part in this project, I can notify the researchers involved and withdraw immediately.

consent to the processing of my personal information for the purposes of this research study.

understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.

understand that some of the MRI data will be transferred for analysis to the Principal Investigator's second laboratory at Virginia Tech University in the USA and will therefore no longer be subject to EEA data protection laws but that this data will be anonymised and no identifiable personal information will be shared or transferred.

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in this study.

I agree that my non-personal research data may be used by others for future research. I am assured that the confidentiality of my personal data will be upheld through the removal of identifiers.

I understand that part of my participation will be audio-recorded (the interviews) and I consent to the anonymous use of this material as part of the project.

I agree to be contacted in the future by UCL researchers who would like to invite me to participate in follow-up studies.

I understand that the information I have submitted will be published as a report and that I can request a copy. Confidentiality and anonymity will be maintained and it will not be possible to identify me from any publications.

I agree that the research team might re-contact me in case that additional data has to be obtained or for follow- up studies.

Please initial the statements below if you agree with them:
Initial here

I agree to take part in the general part of the PD-CPA study as outlined in the information

Sheet and to all points listed above.

(a separate consent for the MRI, tattoocomponent, and genetics component follows below).

I agree to the audio recording of interviews and I consent to the anonymous use of this material as part of the project.

I agree that some of the study data will be shared with the collaborating laboratory at Virginia Tech University in the USA.

I understand that relevant sections of medical and or probation notes and data collected during my clinical assessment and during the study from me, may be looked at by individuals from the PD-CPA research team, my clinician or

from the NHS Trust, where it is relevant to our taking part in this research. I give permission for these individuals to have access to my records.

I agree that the PD-CPA research team can contact me about coming in for up to two follow-up sessions over the next three years.

I agree that I can be contacted after the end of this study about possible future research and follow-up with PD-CPA and related groups.

I agree that my GP can be told that I am participating in this study.

GP's name: _____ Surgery: _____

Address: _____

MRI and Cognition:

I agree to have an MRI scan and I understand what will happen in the scan.

I have had an MRI safety check and I am confident that there is no reason why I can't have a scan, such as a recent operation.

I agree that my test results can be held by the Wellcome Trust and shared with other research groups, and I understand that this data will be anonymous and not contain any personal information.

Genetics:

You do not have to agree to provide blood or saliva samples to take part in the research.

You do not have to agree that any samples you do give can be stored for future testing.

By giving a sample, you consent to be contacted by BioResource about the possibility of joining their panel, but you are under no obligation to join BioResource.

I agree to give a sample of **blood and saliva** (delete as appropriate) for medical research

and for details about me and any samples I provide to be kept on a secure database. I agree that BioResource, the study collaborator on genetics, can store my samples and can contact me to invite me to join their panel.

I agree that the samples and information I provide can be stored for use in future medical research, subject to ethical approval.

I understand that I will not benefit financially if my samples are used in research leading to a new treatment or medical test being developed.

In the unlikely event that an abnormality is picked up from tests carried out on my sample, I agree to be informed, and with my consent my GP can be told.

Thank you for your help.

By completing and returning this form, you are giving us your consent that the personal information you provide will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.

Participant:

Signed: Date:

Researcher:

Signed: Date:

Appendix 7: Operationalized Psychodynamic Diagnosis-Structural Questionnaire

5. Questionnaire on Self-description — OPD-SQ

On the following pages you will find a number of statements that describe various characteristics of a person. Please indicate to what extent these statements apply to you. Please tick the answer, which in general describes you the best. There are no right or wrong answers because people differ in the way they experience themselves. Some statements apply to relationships. Please answer those questions according to how you usually experience yourself in relationships. If you have not been in a relationship with a romantic partner yet, imagine yourself to be in one.

		fully disagree	**partly disagree**	**neither agree nor disagree**	**partly agree**	**fully agree**
1.	I find it very difficult to describe myself.	☐	☐	☐	☐	☐
2.	When I'm very upset, I often act without thinking.	☐	☐	☐	☐	☐
3.	I sometimes feel like a stranger to myself.	☐	☐	☐	☐	☐
4.	My inner images and ideas frighten me.	☐	☐	☐	☐	☐
5.	If I lose something that is familiar to me, I easily lose my footing.	☐	☐	☐	☐	☐
6.	I'm often accused of being selfish in relationships.	☐	☐	☐	☐	☐
7.	Others often experience my behavior very differently from how it was meant.	☐	☐	☐	☐	☐

8.	I often have feelings that I can't understand.	☐	☐	☐	☐	☐
9.	I think losses are more painful for me than for other people.	☐	☐	☐	☐	☐
10.	I often get myself into difficult situations unintentionally.	☐	☐	☐	☐	☐
11.	When dealing with others, I'm more awkward than other people.	☐	☐	☐	☐	☐
12.	It's easy for me to accept when people offer to help me.	☐	☐	☐	☐	☐
13.	If someone criticises me I find it hard to get over it.	☐	☐	☐	☐	☐
14.	I struggle with separations and goodbyes.	☐	☐	☐	☐	☐
15.	Other people are either very familiar or very alien to me.	☐	☐	☐	☐	☐
16.	I'm often uncertain as to what I'm feeling in that moment.	☐	☐	☐	☐	☐
17.	I often get unpleasant surprises with others because I am too uncritical.	☐	☐	☐	☐	☐
18.	Sometimes I feel like other people can look right through me and read my thoughts or feelings.	☐	☐	☐	☐	☐
19.	Sometimes I am so full of rage that I feel I might lose it.	☐	☐	☐	☐	☐

20.	If someone is having a bad time that usually preoccupies me very much.	☐	☐	☐	☐	☐
21.	Sometimes I'm not sure whether someone has particular thoughts about me, or whether it's just my imagination.	☐	☐	☐	☐	☐
22.	I find difficult to be aware of my feelings.	☐	☐	☐	☐	☐
23.	When I'm angry, I frequently cause harm in relationships.	☐	☐	☐	☐	☐
24.	Ultimately, for me there are only friends or foes and not much in between.	☐	☐	☐	☐	☐
25.	My inner fantasies and ideas enliven and enrich me.	☐	☐	☐	☐	☐
26.	Misunderstandings often occur between myself and others.	☐	☐	☐	☐	☐
27.	If I think too much about myself, I tend to get confused.	☐	☐	☐	☐	☐
28.	I find it difficult to ask others for help.	☐	☐	☐	☐	☐
29.	If someone gets too close to me I get tense or even [start to] panic, even if it is meant in a friendly way.	☐	☐	☐	☐	☐
30.	I think I often neglect myself.	☐	☐	☐	☐	☐
31.	I've often been told that I don't show my feelings enough.	☐	☐	☐	☐	☐

32.	It can be dangerous to let others get too close to you.	☐	☐	☐	☐	☐
33.	It is often not clear to me what exactly I'm feeling in that moment.	☐	☐	☐	☐	☐
34.	I tend to relate others' remarks or actions to myself that may not be connected to me at all.	☐	☐	☐	☐	☐
35.	When someone tells me about their problems it stays with me for a long time.	☐	☐	☐	☐	☐
36.	I've usually got a good grip on myself, even when I'm boiling with rage.	☐	☐	☐	☐	☐
37.	Basically my body is alien to me.	☐	☐	☐	☐	☐
38.	All in all, I'm happy with the way I am.	☐	☐	☐	☐	☐
39.	Sometimes something arises in methat feels like it doesn't belong to me.	☐	☐	☐	☐	☐
40.	I don't have good self-esteem.	☐	☐	☐	☐	☐
41.	Inside me, there's often such a chaos of feelings that I couldn't even describe it.	☐	☐	☐	☐	☐
42.	Sometimes I explode.	☐	☐	☐	☐	☐
43.	In arguments I sometimes feel like: "It's either it's either me or them".	☐	☐	☐	☐	☐
44.	Sometimes the only thing I feel is panic.	☐	☐	☐	☐	☐

45.	In my life I haven't had many good experiences with others.	☐	☐	☐	☐	☐
46.	I think it affects me more than others if someone around me is having problems.	☐	☐	☐	☐	☐
47.	If I can't cope on my own I ask others for help.	☐	☐	☐	☐	☐
48.	I prefer not to think about myself as all I'd face is chaos.	☐	☐	☐	☐	☐
49.	I sometimes misjudge how my behaviour affects others.	☐	☐	☐	☐	☐
50.	If others know a lot about me I often feel somehow controlled or observed.	☐	☐	☐	☐	☐
51.	I often suffer from an unbearable inner tension without knowing the reason for it.	☐	☐	☐	☐	☐
52.	It frightens me that in different situations I feel like different persons.	☐	☐	☐	☐	☐
53.	I think I come across as cold and callous.	☐	☐	☐	☐	☐
54.	I've been told repeatedly that I'm not considerate enough about other people's needs.	☐	☐	☐	☐	☐
55.	Inner images and using my imagination help me to restore my inner balance.	☐	☐	☐	☐	☐
56.	I often get involved with others who only reveal their true character after a while.	☐	☐	☐	☐	☐

57.	I find it hard to do something good for myself.	☐	☐	☐	☐	☐
58.	I often can't feel my body properly.	☐	☐	☐	☐	☐
59.	I notice that events which are in fact important hardly evoke any feelings in me.	☐	☐	☐	☐	☐
60.	People either are on the same wavelength as me or I don't know what to make of them.	☐	☐	☐	☐	☐
61.	It happens repeatedly that I completely misinterpret what other people say.	☐	☐	☐	☐	☐
62.	From time to time I enjoy letting my thoughts and fantasies drift.	☐	☐	☐	☐	☐
63.	I put my foot in it quite often.	☐	☐	☐	☐	☐
64.	I often experience myself more like an object than a human being.	☐	☐	☐	☐	☐
65.	Others often react to me in a rejecting way and I don't understand why.	☐	☐	☐	☐	☐
66.	I often have to think of certain people who might harm me.	☐	☐	☐	☐	☐
67.	Thinking about myself frightens me.	☐	☐	☐	☐	☐
68.	I guess I'm often quite naive.	☐	☐	☐	☐	☐

69.	I hate my body.	☐	☐	☐	☐	☐
70.	I often have terrifying fantasies.	☐	☐	☐	☐	☐
71.	Sometimes I'm afraid that the boundary between me and others will disappear.	☐	☐	☐	☐	☐
72.	I find it easy to get in contact with other people.	☐	☐	☐	☐	☐
73.	Sometimes my feelings are so intense that I get scared.	☐	☐	☐	☐	☐
74.	I often feel like a house of cards that could collapse any minute.	☐	☐	☐	☐	☐
75.	With me, conversations often turn into fights when something important is at stake.	☐	☐	☐	☐	☐
76.	No matter what I do I am never quite satisfied with it.	☐	☐	☐	☐	☐
77.	A lot has to happen before I ask other people for help.	☐	☐	☐	☐	☐
78.	I've been hurt badly because of misjudging someone.	☐	☐	☐	☐	☐
79.	I find it hard to get in contact with other people.	☐	☐	☐	☐	☐
80.	I often feel useless and dispensable.	☐	☐	☐	☐	☐

81.	I find it difficult to make myself understood to others.	☐	☐	☐	☐	☐
82.	After separations or losses I feel like the rug has been pulled from under me.	☐	☐	☐	☐	☐
83.	I wish I could keep other people's problems away from me more easily.	☐	☐	☐	☐	☐
84.	To me, people are either good or bad.	☐	☐	☐	☐	☐
85.	From time to time it is difficult for me to predict how others will react to me.	☐	☐	☐	☐	☐
86.	I'd like to be able to have more access to my inner feelings.	☐	☐	☐	☐	☐
87.	During arguments I sometimes hurt people badly who are actually important to me.	☐	☐	☐	☐	☐
88.	I don't treat myself particularly well.	☐	☐	☐	☐	☐
89.	If a partner is very clingy I often feel a strong aversion.	☐	☐	☐	☐	☐
90.	My experience is: If you trust people too much you can get nasty surprises.	☐	☐	☐	☐	☐
91.	Others tell me that I keep choosing the wrong friends.	☐	☐	☐	☐	☐
92.	My feelings often are like a rollercoaster.	☐	☐	☐	☐	☐

93.	If I have to approach a stranger, I feel uneasy.	☐	☐	☐	☐	☐
94.	It often takes a long time until I discover other people's dark sides.	☐	☐	☐	☐	☐
95.	I have really regretted some arguments later on because something was destroyed by them.	☐	☐	☐	☐	☐

Appendix 8: OPD-SQ revised

6. Self-description Questionnaire — OPD-SQ

On the following pages you will find a number of statements that describe various characteristics of a person. Please indicate to what extent these statements apply to you. Please tick the answer which describes you the best in general. There are no right or wrong answers because people differ in the way they experience themselves. Some statements apply to relationships. Please answer those questions according to how you usually experience yourself in relationships. If you have not yet been in a romantic relationship, imagine how you would see yourself in one.

		fully disagree	**partly disagree**	**neither agree nor disagree**	**partly agree**	**fully agree**
1.	I find it very difficult to describe myself.	☐	☐	☐	☐	☐
2.	When I'm very upset, I often act without thinking.	☐	☐	☐	☐	☐
3.	I sometimes feel like a stranger to myself.	☐	☐	☐	☐	☐
4.	The images and ideas in my mind frighten me.	☐	☐	☐	☐	☐
5.	If I lose something that is special to me, I easily lose my footing.	☐	☐	☐	☐	☐
6.	I'm often accused of being selfish in relationships.	☐	☐	☐	☐	☐
7.	Others often experience my actions very differently from how they were meant.	☐	☐	☐	☐	☐
8.	I often have feelings that I can't	☐	☐	☐	☐	☐

	understand.					
9.	I think losses are more painful for me than for other people.	☐	☐	☐	☐	☐
10.	I often get myself into difficult situations unintentionally.	☐	☐	☐	☐	☐
11.	When dealing with others, I'm more awkward than other people.	☐	☐	☐	☐	☐
12.	It's easy for me to accept help when people offer it.	☐	☐	☐	☐	☐
13.	If someone criticises me I find it hard to get over it.	☐	☐	☐	☐	☐
14.	I struggle with separations and goodbyes.	☐	☐	☐	☐	☐
15.	Other people are either very familiar or very alien to me.	☐	☐	☐	☐	☐
16.	I'm often uncertain as to what I'm feeling in that moment.	☐	☐	☐	☐	☐
17.	I am often unpleasantly surprised by others because I'm not a good judge of character.	☐	☐	☐	☐	☐
18.	Sometimes I feel like other people can look right through me and read my thoughts or feelings.	☐	☐	☐	☐	☐
19.	Sometimes I am so full of rage that I feel I might lose it.	☐	☐	☐	☐	☐

20.	If someone is having a bad time that usually troubles me very much.	☐	☐	☐	☐	☐
21.	Sometimes I'm not sure whether someone has particular thoughts about me, or whether it's just my imagination.	☐	☐	☐	☐	☐
22.	I find difficult to be aware of my feelings.	☐	☐	☐	☐	☐
23.	I frequently cause harm in relationships when I'm angry.	☐	☐	☐	☐	☐
24.	Ultimately, for me there are only friends or foes and not much in between.	☐	☐	☐	☐	☐
25.	My inner fantasies and ideas enliven and enrich me.	☐	☐	☐	☐	☐
26.	Misunderstandings often occur between myself and others.	☐	☐	☐	☐	☐
27.	If I think too much about myself, I tend to get confused.	☐	☐	☐	☐	☐
28.	I find it difficult to ask others for help.	☐	☐	☐	☐	☐
29.	If someone gets too close to me I get tense or even start to panic, even if it was meant in a friendly way.	☐	☐	☐	☐	☐
30.	I think I often neglect myself.	☐	☐	☐	☐	☐
31.	I've often been told that I don't show my feelings enough.	☐	☐	☐	☐	☐

32.	It can be dangerous to let others get too close to you.	☐	☐	☐	☐	☐
33.	It is often not clear to me what exactly I'm feeling in that moment.	☐	☐	☐	☐	☐
34.	I tend to relate others' remarks or actions to myself which may not really be connected to me at all.	☐	☐	☐	☐	☐
35.	When someone tells me about their problems it stays with me for a long time.	☐	☐	☐	☐	☐
36.	I've usually got a good grip on myself, even when I'm boiling with rage.	☐	☐	☐	☐	☐
37.	My body is basically alien to me.	☐	☐	☐	☐	☐
38.	All in all, I'm happy with the way I am.	☐	☐	☐	☐	☐
39.	Sometimes something arises in me that feels like it doesn't belong to me.	☐	☐	☐	☐	☐
40.	I don't have good self-esteem.	☐	☐	☐	☐	☐
41.	There is often such a chaos of feelings inside me that I couldn't even describe it.	☐	☐	☐	☐	☐
42.	Sometimes I explode.	☐	☐	☐	☐	☐
43.	In arguments I sometimes feel like: "It's either me or them".	☐	☐	☐	☐	☐
44.	Sometimes the only thing I feel is panic.	☐	☐	☐	☐	☐

45.	I haven't had many good experiences with others in my life.	☐	☐	☐	☐	☐
46.	I think it affects me more than others if someone around me is having problems.	☐	☐	☐	☐	☐
47.	If I can't cope on my own I ask others for help.	☐	☐	☐	☐	☐
48.	I prefer not to think about myself because all I would face is chaos.	☐	☐	☐	☐	☐
49.	I sometimes misjudge how my behaviour affects others.	☐	☐	☐	☐	☐
50.	If others know a lot about me I often feel somehow controlled or observed.	☐	☐	☐	☐	☐
51.	I often suffer from an unbearable inner tension without knowing the reason for it.	☐	☐	☐	☐	☐
52.	It frightens me that in different situations I feel like different persons.	☐	☐	☐	☐	☐
53.	I think I come across as cold and callous.	☐	☐	☐	☐	☐
54.	I've been told repeatedly that I'm not considerate enough of other people's needs.	☐	☐	☐	☐	☐
55.	Internal images and using my imagination help me to restore my inner balance.	☐	☐	☐	☐	☐
56.	I often get involved with others who only reveal their true character after a while.	☐	☐	☐	☐	☐

57.	I find it hard to do something good for myself.	☐	☐	☐	☐	☐
58.	I often can't feel my body properly.	☐	☐	☐	☐	☐
59.	I notice that events which are in fact important hardly evoke any feelings in me.	☐	☐	☐	☐	☐
60.	People either are on the same wavelength as me or I don't know what to make of them.	☐	☐	☐	☐	☐
61.	It is often the case that I completely misinterpret what other people say.	☐	☐	☐	☐	☐
62.	I enjoy letting my thoughts and fantasies drift from time to time.	☐	☐	☐	☐	☐
63.	I feel like I "put my foot in it" quite often.	☐	☐	☐	☐	☐
64.	I often perceive myself more like an object than a human being.	☐	☐	☐	☐	☐
65.	Others often react towards me in a rejecting way and I don't understand why.	☐	☐	☐	☐	☐
66.	I often have to think about certain people who might harm me.	☐	☐	☐	☐	☐
67.	Thinking about myself frightens me.	☐	☐	☐	☐	☐
68.	I would say that I'm often quite naive.	☐	☐	☐	☐	☐
69.	I hate my body.	☐	☐	☐	☐	☐

70.	I often have terrifying fantasies.	☐	☐	☐	☐	☐
71.	Sometimes I'm afraid that the boundary between me and others will disappear.	☐	☐	☐	☐	☐
72.	I find it easy to get in contact with other people.	☐	☐	☐	☐	☐
73.	Sometimes my feelings are so intense that I get scared.	☐	☐	☐	☐	☐
74.	I often feel like a house of cards that could collapse any minute.	☐	☐	☐	☐	☐
75.	With me, conversations often turn into arguments when something important is at stake.	☐	☐	☐	☐	☐
76.	No matter what I do I am never quite satisfied with it.	☐	☐	☐	☐	☐
77.	A lot has to happen before I ask other people for help.	☐	☐	☐	☐	☐
78.	I've been hurt badly because I misjudged someone.	☐	☐	☐	☐	☐
79.	I find it hard to get in contact with other people.	☐	☐	☐	☐	☐
80.	I often feel useless and dispensable.	☐	☐	☐	☐	☐
81.	I find it difficult to make others understand me.	☐	☐	☐	☐	☐

82.	After separations or losses I feel like the rug has been pulled from under me.	☐	☐	☐	☐	☐
83.	I wish I could keep other people's problems away from me more easily.	☐	☐	☐	☐	☐
84.	To me, people are either good or bad.	☐	☐	☐	☐	☐
85.	From time to time it is difficult for me to predict how others will react towards me.	☐	☐	☐	☐	☐
86.	I'd like to be able to have more access to my inner feelings.	☐	☐	☐	☐	☐
87.	During arguments I sometimes hurt people badly who are actually important to me.	☐	☐	☐	☐	☐
88.	I don't treat myself particularly well.	☐	☐	☐	☐	☐
89.	I often feel a strong aversion if a partner is very clingy.	☐	☐	☐	☐	☐
90.	My experience is: If you trust people too much you can get nasty surprises.	☐	☐	☐	☐	☐
91.	Others tell me that I keep choosing the wrong friends.	☐	☐	☐	☐	☐
92.	My feelings often are like a rollercoaster.	☐	☐	☐	☐	☐
93.	I feel uneasy if I have to approach a stranger.	☐	☐	☐	☐	☐
94.	It often takes a long time until I discover	☐	☐	☐	☐	☐

	other people's dark sides.					
95.	I have really regretted some arguments later on because they were damaging to the relationship	☐	☐	☐	☐	☐

Appendix 9: Internal consistency of the OPD-SQ

Table 1. Internal consistency of OPD-SQ

Subscales	Cronbach's Alpha
Self perception	0.97
Object perception	0.90
Self-regulation	0.94
Object relations	0.94
Inward emotional communication	0.80
External emotional communication	0.88
Internal attachment	0.95
External attachment	0.84
OPD-SQ total	0.97

Appendix 10: Results of canonical correlation between

BSI and OPD-SQ

Table 1. Canonical correlation for BSI predicting OPD-SQ for functions 1 and 2

Variables	Function 1			Function 2		
	Coefficient	r	R^2 (%)	Coefficient	r	R^2 (%)
Depression	-.05	-.82	67.24	-.08	-.28	7.84
Paranoid	-.01	.77	59.29	.15	.23	5.29
Psychoticism	.01	-.72	51.84	-.12	-.29	8.41
Interpersonal sensitivity	-.04	-.84	70.56	.06	-.07	.49
Somatization	-.01	-.61	37.21	.06	.05	.25
Obsessive compulsive	-.07	-.86	73.96	-.03	-.16	2.56
Anxiety	.03	-.75	56.25	-.10	-.23	5.29
Hostility	-.05	-.68	46.24	.12	.47	22.09
Phobic anxiety	-.02	-.72	51.84	-.01	-.12	1.44

Appendix 11: Results of canonical correlation between PAI-BOR and OPD-SQ

Table 1. Canonical correlation for PAI-BOR predicting OPD-SQ for functions 1 and 2

Variables	Function 1			Function 2		
	Coefficient	r	R^2 (%)	Coefficient	r	R^2 (%)
Identity problems	.04	.85	72.3	.15	.49	24.01
Negative relations	.02	.77	59.3	-.08	-.31	9.61
Slef-harm	.01	.74	54.8	-.04	-.21	4.41
Affective instability	.06	.93	86.5	-.05	-.21	4.41

Appendix 12: Debriefing handout given to participants at the end of assessment

People with Psychological Difficulties.

Thank you for taking part in our study, we appreciate that you gave up your time to take part and hope that you found it interesting.

Summary of the Research Project

The aim of our study is to understand how mind and brain work in order to better understand patients with psychological difficulties. We hope that this will have an impact on the development of specific treatment interventions.

Most of our tasks are designed to look at how we think about ourselves and others (called "mentalisation"), how we regulate our emotions, value co-operation or experience close relationships and how problems can sometimes develop in these relationships.

Getting a better sense of the different strategies that people apply in these areas can help us understand more about when people experience mental health problems that can lead them to find certain social interactions and situations challenging. We hope to use these findings so that treatments can be tailored to help improve the domains where a patient's difficulties may lie.

We are also interested in how someone's experiences in childhood and his or her parenting at that time impact on the performances in the tasks and the functioning of the brain areas that underpin them. For instance, the long interview can tell us more about the quality of your bonding with parents.

Some of the topics discussed in the course of the study may have brought about thoughts or feelings which you had not previously considered or may have made you recall memories which could be perceived as distressing or lead you to feel tense or ruminate on thoughts. Therefore, we have provided some exercises at the back of this sheet which may help you to cope with any such feelings which you may experience.

What to do if you continue to feel concerned

If you continue to feel concerned after taking part in the study it may be useful to talk to a family member, a friend or your GP. Your Lead Clinician (care co-ordinator) or Probation Worker will also be able to support you, if you have one.

In addition to this support there is also free and confidential advice provided by the Mental Health charity Mind which can be found on their website: http://www.mind.org.uk/ or by calling their advice line 0300 123 3393.

If you feel at immediate risk do not hesitate to contact Dr Janet Feigenbaum (details overleaf).

Contact Details

If you still have concerns or wish to contact the research team to discuss any of the information further or any concerns you have about the study, then please do so by getting in touch with the members of the research team listed below:

If you feel that we have not addressed your questions adequately or if you have any concerns about the conduct of the research team, then please contact my supervisor Dr. Janet Feigenbaum (Strategic and Clinical Lead for Personality Disorder Services, North East London NHS Foundation Trust and Senior Lecturer, Research Department of Clinical, Educational and Health Psychology, UCL) on 07957 919 961 or by email at janet.feigenbaum@nhs.net.

Janet Feigenbaum, PhD

Research Department of Clinical, Educational and Health Psychology

General Office, Room 436, 4th Floor
1-19 Torrington Place, London, WC1E 7HB

telephone: 07957 919 961

Tobias Nolte MD

Wellcome Trust Centre for Neuroimaging & Research Department of Clinical, Educational and Health Psychology

12 Queen Square

London

WC1N 3BG

Tobias.nolte@annafreud.org

Thank you very much for taking the time to read this information sheet.

Relaxation Exercises

Progressive Muscle Relaxation Technique
{Pause between instructions}

Begin by finding a comfortable position either sitting or lying down in a location where you will not be interrupted.
Allow your attention to focus only on your body. If you begin to notice your mind wandering, bring it back to the muscle you are working on.

Take a deep breath through your abdomen, hold for a few seconds, and exhale slowly. Again, as you breathe notice your stomach rising and your lungs filling with air.

As you exhale, imagine the tension in your body being released and flowing out of your body.
And again inhale…..and exhale. Feel your body already relaxing.

As you go through each step, remember to keep breathing .

Now let's begin. Tighten the muscles in your forehead by raising your eyebrows as high as you can. Hold for about five seconds. And abruptly release feeling that tension fall away.

Now smile widely, feeling your mouth and cheeks tense. Hold for about 5 seconds, and release, appreciating the softness in your face.

Next, tighten your eye muscles by squinting your eyelids tightly shut. Hold for about 5 seconds, and release.

Gently pull your head back as if to look at the ceiling. Hold for about 5 seconds, and release, feeling the tension melting away.

Now feel the weight of your relaxed head and neck sink.

Breath in…and out.

In…and out.

Let go of all the stress

In…and out.

Now, tightly, but without straining, clench your fists and hold this position until I say stop. Hold for about 5 seconds, and release.

Now, flex your biceps. Feel that buildup of tension. You may even visualize that muscle tightening.

Hold for about 5 seconds, and release, enjoying that feeling of limpness.

Breath in...and out.

Now tighten your triceps by extending your arms out and locking your elbows. Hold for about 5 seconds, and release.

Now lift your shoulders up as if they could touch your ears. Hold for about 5 seconds, and quickly release, feeling their heaviness.

Tense your upper back by pulling your shoulders back trying to make your shoulder blades touch.

Hold for about 5 seconds, and release.

Tighten your chest by taking a deep breath in, hold for about 5 seconds, and exhale, blowing out all the tension.

Now tighten the muscles in your stomach by sucking in. Hold for about 5 seconds, and release.

Gently arch your lower back. Hold for about 5 seconds, relax.

Feel the limpness in your upper body letting go of the tension and stress, hold for about 5 seconds, and relax.

Tighten your buttocks. Hold for about 5 seconds…, release, imagine your hips falling loose.

Tighten your thighs by pressing your knees together, as if you were holding a penny between them.

Hold for about 5 seconds…and release.

Now flex your feet, pulling your toes towards you and feeling the tension in your calves. Hold for about 5 seconds, and relax, feel the weight of your legs sinking down.

Curl your toes under tensing your feet. Hold for about 5 seconds, release.

Now imagine a wave of relaxation slowly spreading through your body beginning at your head and going all the way down to your feet.

Feel the weight of your relaxed body.

Breathe in…and out…in…out….in…out.

Mindfulness Exercise

Read the following instructions

Sit comfortably, with your eyes closed and your spine reasonably straight.

Bring your attention to your breathing.

Imagine that you have a balloon in your tummy. Every time you breathe in, the balloon inflates. Each time you breathe out, the balloon deflates. Notice the sensations in your abdomen as the balloon inflates and deflates. Your abdomen rising with the in-breath, and falling with the out-breath.

Thoughts will come into your mind, and that's okay, because that's just what the human mind does. Simply notice those thoughts, then bring your attention back to your breathing.

Likewise, you can notice sounds, physical feelings, and emotions, and again, just bring your attention back to your breathing.

You don't have to follow those thoughts or feelings, don't judge yourself for having them, or analyse them in any way. It's okay for the thoughts to be there. Just notice those thoughts, and let them drift on by, bringing your attention back to your breathing.

Whenever you notice that your attention has drifted off and is becoming caught up in thoughts or feelings, simply note that the attention has drifted, and then gently bring the attention back to your breathing.

It's okay and natural for thoughts to enter into your awareness, and for your attention to follow them. No matter how many times this happens, just keep bringing your attention back to your breathing.