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A Systematic Review of Potential Mechanisms of Change in Psychotherapeutic Interventions for Personality Disorder

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Abstract

Purpose: Despite increased understanding about 'what works' for people with personality disorder, there remains a significant gap in knowledge about how these interventions work. This systematic review summarises and critiques the existing literature about mechanisms of change in psychotherapies for people with personality disorder.

Method: Relevant literature was identified through systematic electronic searches of online databases and key journals.

Results: Twenty one empirical papers were identified which indicated that the therapeutic alliance, rupture resolution, therapist interpretations, reflective functioning (mentalizing), skills use, emotion regulation, experiential avoidance, personality organisation, and cognitive change are possible mechanisms of change in individual psychotherapeutic interventions for people with personality disorder.

Conclusions: There is greater evidence for the role of the therapeutic alliance and resolution of its rupture in change processes compared to other potential mechanisms of change. Identifying mechanisms of change has implications for clinical practice, and these are discussed. Further research into change processes for people with personality disorder is required.

Keywords: Personality disorder; Therapeutic alliance; Rupture; Interpretations; Reflective functioning; Skills us; Emotion regulation; Experiential avoidance; Personality organisation; Cognitive change

Practitioner Points

- Identifying mechanisms of change may facilitate the development of more effective psychotherapeutic interventions.
- Nine potential mechanisms of change operating across interventions for people with personality disorder are the therapeutic alliance, rupture resolution, therapist interpretations, reflective functioning, skills use, emotion regulation, experiential avoidance, personality organisation, and cognitive change.
- Varying degrees of empirical evidence support the operation of these potential mechanisms of change as having an impact upon treatment outcome.
- Each mechanism of change has the potential to be harnessed by clinicians to enhance and refine existing interventions for people with personality disorder.

Introduction

Mechanisms of change

Mechanisms of change refer to the key processes within therapy that are crucial to clinical change [1]. Investigating mechanisms of change can help to identify and preserve the ingredients of an intervention which must not be diluted to achieve change, and can enable the development of more effective treatments [2,3]. Nock and Kazdin proposed eight methodological criteria required for demonstrating the operation of a mechanism of change. These are described in Table 1[4,5].

Mediation and moderation

Two concepts which are crucial for understanding more about mechanisms of change are mediation and moderation [2,5]. A mediating variable "accounts for the relation between treatment and outcome…a mediator changes during the course of treatment, and changes in outcome can be explained by changes in the mediator" [6]. However, mediators may not explain the precise process through which change occurs [2]. By definition, all mechanisms of change are mediators, but not all mediators are mechanisms [7]. Much of the literature does not discriminate between mediators and mechanisms and this review will therefore need to use the terms interchangeably.

A moderating variable is a factor that precedes the intervention, such as severity of symptoms, and the value or level of this moderator makes a differential impact on the outcome of the intervention [7,8]. As this review is interested in the mechanisms responsible for change processes in interventions for personality disorder, findings about moderators will not be included unless the type of personality disorder itself moderates a relationship between the proposed mechanism and outcome.

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Criterion	Explanation
Strong Association	There must be correlation between the variables: A strong association should not only exist between the intervention and outcome, but also between the proposed mechanism and the intervention, and between the proposed mechanism and treatment outcome.
Specificity	Change in the intervention is uniquely related to change in the proposed mechanism, and change in the proposed mechanism is uniquely related to change in treatment outcome.
Gradient	Amount of change in the intervention is directly related to the amount of change in the proposed mechanism, which consequently influences the degree of patient change. Greater activation of the proposed mechanism which corresponds with greater change in outcome supports the operation of a change mechanism or mediator.
Temporal Relation	A change in the proposed mechanism precedes a change in outcome. This requires simultaneous and repeated assessment of the proposed mechanism and outcome throughout the course of the intervention.
Consistency	Findings are replicated across studies, samples, and conditions. However, inconsistency in findings may point towards a moderating variable rather than evidence that the proposed mechanism of change does not exist.
Experimental Design	Allows careful manipulation of variables to demonstrate a causal effect of treatment upon outcome, and of the proposed mechanism of change upon outcome. Manipulating the proposed mechanism and observing a differential effect on outcome supports the case for a mechanism of change.
Plausibility and Coherence	There needs to be a plausible explanation of the process through which the mechanism of change has an effect, and this explanation should be coherent with existing knowledge.
In concert	The satisfaction of these criteria 'in concert' strengthens the case for a mechanism of change, and this is unlikely to be achieved in one study alone. At a minimum, the criteria of strong association, temporal relation, experimental design, and specificity are required to support the operation of a mechanism of change.

Table 1: Eight criteria for establishing the operation of a mechanism of change [4,5].

Personality disorders

Personality Disorders are characterised by severe and complex psychopathology, and represent "extreme or significant deviations from the way in which the average individual in a given culture perceives, thinks, feels and, particularly, relates to others" [9]. Personality Disorders are thought to be deeply ingrained, and can manifest in enduring patterns of behaviour which may be unhelpful and inflexible across personal and social situations. In addition, they are frequently associated with subjective distress and problems in interpersonal and social functioning [9].

Ten different types of personality disorders are identified in the Diagnostic and Statistical Manual for Mental Disorders which are categorised according to three clusters: Cluster A described as odd or eccentric (paranoid, schizoid, schizotypal), Cluster B described as emotional and dramatic (antisocial, borderline, histrionic, narcissistic), and Cluster C referring to fearful and anxious (obsessive-compulsive, avoidant, dependent) [10]. The recent publication of the DSM-5 means that much of the current literature refers to the earlier DSM-IV, which identified the same diagnostic criteria [11]. It is important to note that some different diagnostic terms are used by the International Statistical Classification of Diseases and Related Health Problems [12].

Tyrer et al. [13] emphasised that this lack of agreement between systems of diagnosis, and the high level of instability inherent in personality pathology, create difficulties in the assessment and diagnosis of personality disorder. However, the DSM-5 aims to address limitations in diagnosis; an alternative hybrid dimensional-categorical approach is included in addition to the categorical approach retained from the DSM-IV. This hybrid approach assesses difficulties in personality functioning and patterns of pathological traits, and is intended to stimulate further research in the assessment and diagnosis of personality disorder [10].

The definitive causes of personality disorders are unclear, yet contributing factors may include cognitive factors, such as dysfunctional beliefs, psychosocial factors such as abuse and neglect, and neuropsychological factors such as deficits in attention and memory [14-16]. Much of the research has investigated the aetiology of Borderline Personality Disorder (BPD) in particular, and it has been demonstrated that causal factors for BPD may include Disorganised Attachment and a deficit in mentalizing [17,18].

Interventions for personality disorder and their mechanisms

A number of evidence-based psychotherapeutic interventions for personality disorder have been developed, including Transference Focused Psychotherapy (TFP), Cognitive Therapy, Cognitive Analytic Therapy (CAT), Schema-Focused Therapy (SFT), Dialectical Behaviour Therapy (DBT), and Mentalization-Based Treatment (MBT) [19-24]. It is important to note that many of these were developed primarily for people BPD.

The question of how therapy leads to change is described as "most pressing", yet it seems a particularly difficult question to address in the field of personality disorder for a number of reasons [2]. Firstly, the number of personality disorder diagnoses means that research about mechanisms of change in interventions for Borderline Personality Disorder for example, may not be generalizable to other types of personality disorder. This may be particularly salient given that many psychotherapeutic interventions for personality disorder have been developed primarily for people with BPD. Secondly, diagnoses of personality disorders tend to overlap and be comorbid with other disorders which could influence the operation of mechanisms of change and make it difficult to ascertain whether the mechanism is related to personality disorder or to another disorder [25]. A third potential challenge is that people with personality disorder may experience significant change which is not dependent on psychotherapeutic intervention, as a longitudinal study of 240 individuals with BPD indicated that 88% of the sample remitted over a 10 year period [26]. This seemingly spontaneous remission of personality disorder raises questions about the utility of mechanisms of change operating within psychotherapeutic treatments, and indicates that there may be "mechanisms" operating outside of psychotherapeutic intervention affording a significant area for future study.

Aims of Review

Despite the potential challenges of identifying mechanisms of change in interventions for personality disorder, this review aims to clarify the current position of such research and identify which mechanisms of change appear to be operating across different psychotherapeutic interventions for this population. The review will summarise and evaluate existing empirical research about potential mechanisms of

change in individual interventions for personality disorder, and direct future research towards advancing understanding about how treatments have their effect so that more effective interventions can be developed.

Method

Guidelines

This review was designed and conducted with reference to the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) [27]. As the primary aim of the review was to identify possible mechanisms of change in interventions for personality disorder, it was also relevant to assess the evidence according to Nock and Kazdin [4,5] criteria for establishing the operation of a mechanism of change. Due to the limited quality of some of the relevant studies, a systematic review rather than a meta-analysis was deemed to be more appropriate (Table 1).

Inclusion criteria

This review included published empirical research studies which explicitly investigated potential mechanisms of change within psychotherapeutic interventions for personality disorder. Relevant mechanisms were those which were hypothesized to operate within a treatment rather than occurring outside of a treatment, and which had been measured more than once during the study period to explore changes or differences in the potential mechanism. Studies were included if something was specifically being considered as a potential mechanism of change within a psychotherapeutic intervention, and that the relationship between the proposed mechanism and symptom change was investigated, or if the operation of the proposed mechanism was being investigated across more than one intervention to explore a more universal operation of the mechanism.

Studies were included if all participants in the sample were reported as meeting diagnostic criteria for any type of personality disorder, as assessed by a validated diagnostic tool or interview. This included studies where personality disorder was the only diagnosis, or where the identified personality disorder was co-morbid with other disorders. Much of the literature focused upon adults but one study involving adolescents was found and included as personality pathology between 14-18 years resembles that in adults [28]. Studies were included if available in English, and no date restrictions were placed on year of publication. Studies utilising any research design were included, with the exception of case studies as they are not thought to provide high quality evidence [29].

In order to enhance the utility of this review for informing clinical practice, mechanisms of change that could potentially operate across many interventions for personality disorder were investigated, rather than mechanisms hypothesised to be specific to one intervention. Studies about mechanisms of change in group interventions were not included; the modality of treatment delivery can be a moderator of treatment effects with potentially "enormous impact" and it was beyond the scope of this review to explore this moderation [2]. Where a treatment consisted of conjoint group and individual delivery modes, studies were included where the mechanism of change investigated was not identified as being specific to group processes.

Search strategy

Relevant literature was identified through electronic searches of online databases accessed through the National Library for Health (EMBASE, MEDLINE, PsycINFO, and CINAHL) and key journals, (including Journal of Personality Disorders; Psychology and Psychotherapy: Theory, Research, and Practice). The literature search was conducted in different stages, moving from a broader search initially (e.g., personality disorder AND mechanism of change; personality disorder AND mediat* AND (treatment or intervention)) to more specific searches regarding particular mechanisms of change which had been identified in the initial broad search (e.g., therapeutic alliance AND personality disorder). The search terms used and the number of papers generated for each stage of the electronic search are provided in Figure 1. Titles and abstracts of all identified papers were screened to determine relevance. Reference lists of all full text papers accessed were hand searched for further relevant papers.

Results

The initial broad search identified 206 unique results followed by more specific searches which resulted in a further 2022 results. Figure 1 shows the flow of information through the review which resulted in 21 studies being included in this review. The potential mechanisms of change identified as having been empirically investigated in psychotherapeutic treatments for personality disorder were: the therapeutic alliance; rupture resolution; therapist interpretations; reflective functioning or mentalizing; skills use; emotion regulation; experiential avoidance, personality organisation, and cognitive change. Of the 21 included studies, 10 focused upon the alliance and rupture resolution (Table 2). The remaining 11 studies (Table 3), investigated interpretations (n=3), reflective functioning (n=2), skills use (n=2), emotion regulation (n=1), experiential avoidance (n=1), personality organisation (n=1), and cognitive change (n=1). The evidence for each potential mechanism is appraised individually.

Therapeutic alliance

The therapeutic alliance is an intrinsic aspect of the therapeutic relationship and refers to the "on-going process of negotiation between patient and therapist at both conscious and unconscious levels" and represents how much the patient feels understood and respected [30,31]. The therapeutic alliance is a dynamic part of the relationship that is constantly changing both within and between sessions.

The therapeutic alliance and its rupture have received the most attention in the literature compared to other possible mechanisms of change, and this is reflected by the content of this review. Ten empirical papers were identified for inclusion in this review. Unfortunately, some papers failed to distinguish between the therapeutic relationship more generally and the alliance specifically, and so it was not always clear what was being investigated.

Spinhoven et al. [32] investigated whether the quality of the therapeutic alliance in Schema-Focused Therapy (SFT) and Transference-Focused Psychotherapy (TFP) predicted treatment outcome for 78 adults with BPD. They found the alliance was rated significantly higher by therapists and patients in the SFT group compared to the TFP group. Early patient ratings of the alliance at three months significantly predicted treatment outcome when treatment type was controlled for. The odds ratios for 'reliable improvement' in BPD symptoms or 'recovery' were 1.36 and 1.39 respectively. Of note, the difference in alliance ratings between the SFT and TFP groups remained statistically significant after controlling for symptom change, which indicates that the quality of the alliance is not just a "mere epiphenomenon" of positive change in treatment [32]. These findings suggest that the development and operation of the therapeutic alliance can be affected by treatment type. Nock's and Kazdin's [4,5] criteria for

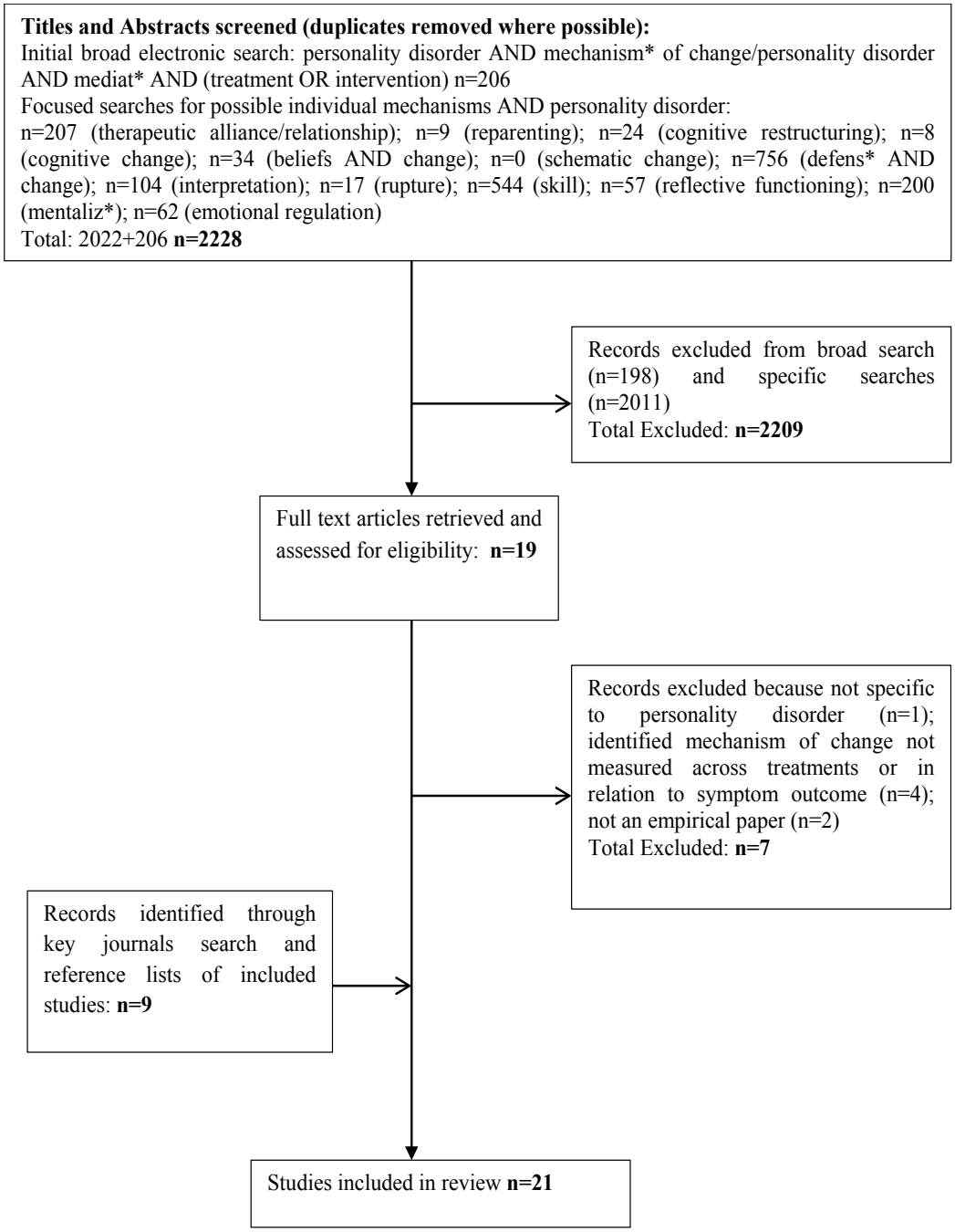

Figure 1: Flow of information through systematic review.

identifying a mechanism of change were met by this study, including an experimental design and strong association, yet the measurement of the therapeutic alliance was infrequent which may undermine the ability to demonstrate a close temporal relationship between change in the proposed mechanism and change in outcome.

A similar investigation was conducted by Bedics et al. [33] in a sample of 101 females with BPD. The therapeutic relationship did not predict treatment outcome by itself, yet there was a significant interaction between the therapeutic relationship and treatment condition in predicting outcome: DBT patients who rated their therapists as actively loving and protecting reported greater self-love and self-care (β=0.23, p<0.001), and reduced self-injury (β=-0.01, p<0.05); the opposite trend was observed in CTBE patients (β=0.18, p<.04; β=0.01, p<0.05). Of merit, blinded independent assessors measured outcome. In accordance with Nock's and Kazdin's [4,5] criterion of consistency, the results reported by Bedics et al. [33] support the results of Spinhoven et al. [32].

Ulvenes et al. [34] investigated the role of the alliance in Cognitive Therapy (CT) and Short-Term Dynamic Psychotherapy (STDP) for 50 patients with Cluster C personality disorders. The therapeutic alliance was positively associated with treatment outcome (β=0.23, p=0.059), yet

Study	Design	Participant n, gender, mean age, diagnosis	Intervention and Follow-Up	Relevant Measures of Mechanism and Outcome	Hypothesized Mechanism(s) of Change and Key Findings	Main Conclusions
Bedics et al. [33]	RCT	n=101 All female 29.3 years BPD	DBT CTBE One year follow up	SASB SASII	Therapeutic Relationship DBT participants reported greater self-affirmation, self-love, and self-protect across treatment and follow-up compared to the CTBE group. DBT therapists were experienced as more affirming, protecting, and controlling than CTBE therapists.	TR by itself did not predict outcomes (patient introject and non-suicidal self-injury), but there was a significant interaction between treatment condition and TR for both outcomes: DBT participants who experienced their therapist as affirming and protecting reported more positive outcomes.
Goldman and Gregory [36]	RCT	n=10 9 female 1 male 27.4 years BPD plus Alcohol Use Disorder	DDP	WAI-observer version BEST	Therapeutic Alliance Quality of the TA was positively associated with improvements in BPD symptoms and alcohol misuse.	Although there was an association between TA and treatment outcome, the sample size was too small to establish mediation or moderation effects.
Gunderson et al. [42]	Exploratory study	n=33 All female 17-35 years BPD	Dynamically-informed and cognitive-behavioural long-term interventions	HAQ SCL-90 GAS	Therapeutic Alliance TA improved over treatment. TA ratings did not correlate with SCL-90 or GAS outcomes.	Ratings of TA are not reliably associated with change in symptoms.
Lingiardi et al. [43]	Exploratory study	n=47 patient-therapist dyads 31 female 16 male 29 years Cluster A (n=12) Cluster B (n=15) Cluster C (n=20)	Individual outpatient psychotherapy	CALPAS SCL-90	Therapeutic Alliance Cluster A patient TA ratings were significantly lower than Cluster B and Cluster C patient ratings. Therapist TA ratings were significantly lower for Cluster B patients than Cluster A and Cluster C patients.	Significant correlations between TA scores and symptom scores (causality not established), but did not measure this at end of treatment. Type of personality disorder impacts upon development of TA.
Marziali et al. [35]	Part of RCT	n=18 Gender and average age not reported BPD	Individual Dynamic Psychotherapy (6-44 sessions; mean = 17.1 sessions)	SAS BDI SCL-90 OBI P-TAS	Therapeutic Alliance Strong association between early and later alliance scores. TA accounted for a significant proportion of the variance in all measure of treatment outcome at 12 months. TA ratings predicted social adjustment scores only at 24 months.	Early and later patient ratings of the TA can account for treatment outcomes at 12 months.
Spinhoven et al. [32]	Part of RCT, exploratory study	n=78 72 female 6 male 29.4 years (TFP) 31.7 years (SFT) BPD	SFT TFP (3 years)	BPDSI-IV WAI DDPRQ-10 YSQ IPO	Therapeutic Alliance TA ratings higher in SFT than TFP. Early TA ratings not predictive of clinical improvement. When treatment condition was controlled for, patient ratings of TA predicted later changes on BPDSI.	Treatment outcome can be partly accounted for by the quality of the TA. Quality of TA is affected by type of treatment approach.
Ulvenes et al. [34]	Part of RCT	n= 46 23 female 23 male 33.5 years (STDP) 34.3 years (CT) Cluster C personality disorder	CT STDP (40 sessions)	HAQ Psychotherapy Process Q-Short [81] SCL-90-R	Therapeutic Alliance TA positively associated with symptom reduction. Therapist avoidance of affect was positively associated with TA. Avoidance of affect was associated with better outcomes in CT. A focus on affect was associated with better outcomes in STDP.	The therapeutic bond is associated with treatment outcome, but appears to interact differently with specific components of treatment according to type of treatment.
Muran et al. [50]	Clinical trial	n=128 68 female 60 male 41.3 years Cluster C personality disorders	30-session CBT, BRT, and STDP	WAI SCL-90R WISPI IIP GAS SEQ Single-item measures about rupture intensity and RR	Therapeutic Alliance; Rupture Resolution TA ratings predictive of change in symptoms. Ruptures rated as lower in intensity associated with higher TA. Greater RR significantly associated with higher TA. No significant correlation between RR and symptom change.	TA associated with treatment outcome. No causality established due to correlational design.-

Strauss et al. [38]	Non-randomized clinical trial	n=30 34.2 years APD OCPD 28% additional PD	CT	CALPAS WISPI BDI SCID-II	Therapeutic Alliance; Rupture Resolution Early patient TA ratings were not correlated with early WISPI and SCID-II scores, but were significantly correlated with early BDI change. RR episodes were associated with substantial (50% or greater) reduction in symptoms.	Early TA ratings and number of RR episodes predict improvement in personality disorder symptoms and depression.
Daly et al. [48]	Adjunct to RCT	n=5 4 female 1 male 15.8 years BPD	CAT	ARM CGI-I SEQ	Rupture Resolution Significant relationships between: i) Adherence to CAT model of responding to ruptures [46] and RR; ii) Adherence to model of RR and positive outcome; iii) RR and improvement on CGI-I.	RR linked to following the steps in Bennett et al.'s [46] model. RR associated with better treatment outcome.

Note: n=number; RCT=Randomised Controlled Trial

Personality Disorders: APD: Avoidant Personality Disorder; BPD: Borderline Personality Disorder; OCPD: Obsessive Compulsive Personality Disorder

Interventions: BRT: Brief Relational Therapy; CAT: Cognitive Analytic Therapy; CBT: Cognitive Behavioural Therapy; CCT: Client-centred Therapy; CT: Cognitive Therapy; CTBE: Community Treatment by Experts; DBT: Dialectical Behavioural Therapy; DDP: Dynamic Deconstructive Psychotherapy; SFT: Schema-Focused Therapy; STDP: Short-term Dynamic Psychotherapy; TFP: Transference-Focused Psychotherapy Mechanisms of Change: RR: Rupture Resolution; TA: Therapeutic Alliance; TR: Therapeutic Relationship

Measures: ARM: Agnew Relationship Measure [82]; BDI: Beck Depression Inventory [41]; BEST: Borderline Evaluation of Severity Index [83]; BPDSI-IV: Borderline Personality Disorder Severity Index [84]; BPRS: Brief Psychiatric Rating Scale [85]; CALPAS: Californian Psychotherapy Alliance Scale [86]; CGI: Clinical Global Impression Improvement [87]; DDPRQ-10: Difficult Doctor Patient Relationship Questionnaire [88]; GAS: Global Assessment Scale [89]; HAQ: Helping Alliance Questionnaire [90]; IIP: Inventory of Interpersonal Problems; IPO: Inventory of Personality Organisation [73]; OBI: Objective Behavioural Index [35]; P-TAS: Patient Therapeutic Alliance Scale [91]; SAS: Social Adjustment Scale [92]; SASBB: Structural Analysis of Social Behaviour [93]; SASII: Suicide Attempt Self Injury Interview [94]; SCID-II: Structured Clinician Interview for DSM-III-R Axis II Disorders [40]; SCL-90: Symptom Checklist [95]; SCL-90-R: Symptom Checklist Revised [96]; SEQ: Session Evaluation Questionnaire [97]; WAI: Working Alliance Inventory [37,98]; WISPI: Wisconsin Personality Disorder Inventory [39]; YSQ: Young Schema Questionnaire [99]

Table 2: A summary of included studies investigating the therapeutic relationship and alliance ruptures.

Study	Design	Participant n, gender, mean age, diagnosis	Intervention and Follow-Up	Relevant Measures of Mechanism and Outcome	Hypothesized Mechanism(s) of Change and Key Findings	Main Conclusions
Hoglend [53]	Adjunct to clinical trial	n=15 12 female 3 male 20-39 years DPD or APD (n=8) BPD or HPD or NPD (n=7)	Dynamic Psychotherapy (up to 53 sessions) with or without transference interpretations	Dynamic Psychotherapy (up to 53 sessions) with or without transference interpretations	Interpretations Significant negative main effect of high frequency of interpretation on dynamic change, not symptom change. Interpretation group not rated as improved on any outcome measure.	Transference interpretations not supported as a mechanism of change.
McCullough et al. [55]	Adjunct to clinical trial, exploratory study	n=16 13 female 3 male 38 years OCPD APD DPD PAPD HPD	STDP BAP (up to 53 sessions)	Process coding system [100]	Interpretations Interpretation of therapist-patient relationship followed by patient affect correlated positively with symptom change. All therapist interventions followed by defensiveness significantly negatively associated with outcome.	Interpretations may be important in the change process for certain patients who respond to them with affect rather than defensiveness.
Schut et al. [52]	Open trial Exploratory study	n=14 9 female 5 male 35.9 years APD Additional personality disorder (64%)	Psychodynamic Psychotherapy (52 sessions)	BAI BDI GAF IIP SASB WISPI	Interpretations Frequency of interpretation was not associated with outcome. Higher concentration of interpretation significantly associated with higher therapist hostility, lower therapist warmth, and poorer GAF and WISPI scores. Unexpected inverse relationship between affiliativeness and symptom outcome.	Interpretations can foster therapeutic change where made in a positive relational context and when not too frequent. Further research required to explore link between interpretation, interpersonal context, and symptom change.
Clarkin and Levy [1]	RCT	n=90 84 female 6 male 18-50 years BPD	TFP DBT SPT (12 months)	AAI RFS	Reflective Functioning Significant increases in RF, attachment security, and attachment coherence in the TFP group compared to the SPT group. Outcomes were reported in Clarkin, Levy, Lenzenweger (2007), which showed all three interventions were associated with positive outcomes. Of 12 outcome variables, TFP predicted improvement in 10 of them, DBT in 5 of them, and SPT in 6 of them.	RF and attachment organization are possible mechanisms of change, although did not report relationship between change in RF and change in symptoms.
Vermote et al. [59]	Clinical trial	n=44 31 female 13 male 28 years Cluster B (n=32) Cluster C (n=7) Cluster B and C (n=5)	Psychodynamic hospitalization-based treatment (up to 12 months)	BDI IPO RFS SCID-II SCL-90 SHI STAXI	Reflective Functioning Significant improvements in outcomes during treatment and follow-up. No linear increases in RF during treatment or follow up, and RF was not associated with symptom change.	RF not supported as a mechanism of change, but authors acknowledged that the relationship between RF and change may be more complex than a linear relationship.

Neacsiu et al. [61]	Part of a RCT	n=108 All female 31.44 years BPD Additional drug dependence (n=45)	DBT (12 months) 4 month follow up Control conditions – CTBE, Treatment as usual, or Validation therapy	DBT-WCCL HRSD SASII STAXI	Skills Use Significantly higher skills use over time in DBT group compared to control conditions. Skills use fully mediated decrease in depression and suicide attempts, and increased control over anger. Skills use partially mediated decrease in non-suicidal self-injury.	Skills use is a mechanism of change for suicidal behaviour (attempts and self-injury), anger control, and depression.
Perroud et al. [63]	Exploratory study	n=53 47 female 5 male 30.5 years BPD	4 week Intensive DBT followed by one year DBT	BDI-II BHS KIMS SCID-II	Skills Use Non-significant decrease in BPD symptoms over time. Significant increase in 'accepting without judgment' mindfulness skill was associated with greater decline in BPD symptoms but this was no longer significant after correction for multiple tests. Other mindfulness skills not associated with symptom change.	The discrete skill of 'accepting without judgment' within Mindfulness skill-set was the only one to increase significantly over treatment and was positively correlated with symptom change, yet not significantly. Use of different skills as mechanisms of change need further study.
Axelrod et al. [64]	Exploratory study	n=27 All female 38 years BPD and Substance Dependence	DBT (20 weeks)	BDI DERS Substance use frequency	Emotion Regulation Significant reduction in substance use by end of treatment. Significant interaction between reduced substance use and improved ER, but not between substance use and BDI.	Improvements in ER associated with reduced substance use. Improvements in mood did not account for reduced substance use.
Berking et al. [67]	RCT	n=81 All females 28.9 years	DBT CTBE (one year)	AAQ HRSD BDI	Experiential Avoidance Scores on AAQ, HRSD, and BDI improved by end of treatment. AAQ significantly associated with BDI and HRSD: reduced avoidance associated with improved depression scores.	Reductions in EA were associated with decreased depression scores. Importantly however, depression scores were not associated with subsequent changes on AAQ.
Arntz and Bernstein [71]	Randomized trial	n=86 80 female 6 male 30 years BPD	SFT TFP (three years)	IPO BDPSI	Personality Organisation Significant symptom improvement in SFT and TFP; superior outcomes in SFT. Changes in IPO throughout treatment correlated strongly with changes in BPDSI scores.	Changes in IPO were associated with improvements in BPD symptomatology.
Brown et al. [76]	Clinical trial	n=32 28 female 4 male 29 years BPD Additional personality disorder (72%)	One year of weekly CT 6 month follow up	BDI-II BHS PBQ SSI	Cognitive Change Significant reductions over time on all outcomes. PBQ scores were significantly reduced by the end of treatment, and between end of treatment and follow-up. Small associations between changes on PBQ and symptom outcome measures.	Beliefs changed significantly during CT, yet this was not strongly associated with change in symptoms.

Note: N: number; RCT: Randomised Controlled Trial
Personality Disorders: APD: Avoidant Personality Disorder; BPD: Borderline Personality Disorder; DPD: Dependent Personality Disorder; HPD: Histrionic Personality Disorder; NPD: Narcissistic Personality Disorder; OCPD: Obsessive Compulsive Personality Disorder; PAPD: Passive Aggressive Personality Disorder
Treatments: BAP: Brief Adaptation-Oriented Psychotherapy; DBT: Dialectical Behaviour Therapy; STDP: Short-term Dynamic Psychotherapy; SPT: Supportive Psychotherapy; TFP: Transference-Focused Psychotherapy
Mechanisms of Change: RF: Reflective Functioning; ER: Emotion Regulation; EA: Experiential Avoidance
Measures: AAI: Adult Attachment Interview [101]; AAQ: Acceptance and Actions Questionnaire [65]; BAI: Beck Anxiety Inventory [102]; BDI: Beck Depression Inventory [41]; BDI-II: Beck Depression Inventory II [103]; BHS: Beck Hopelessness Scale [104]; BPDSI-IV: Borderline Personality Disorder Severity Index [83]; DBT-WCCL: DBT Ways of Coping Checklist [62]; DERS: Difficulties in Emotion Regulation Scale [105]; GAF: Global Assessment of Functioning [106]; GAS: Global Assessment Scale [88]; HRSD: Hamilton Rating Scale of Depression [68,107]; IIP: Inventory of Interpersonal Problems; IPO: Inventory of Personality Organisation [73]; KIMS: Kentucky Inventory of Mindfulness Skills [108]; PBQ: Personality Beliefs Questionnaire [109]; RFS: Reflective Functioning Scale [110]; SASB: Structural Analysis of Behaviour [93]; SASII: Suicide Attempts and Self-Injury Interview [94]; SCID-II: Structured Clinician Interview for DSM-III-R Axis II Disorders [40]; SCL-90: Symptom Checklist [95]; SHI: Self-Harm Inventory [111]; SSI: Scale for Suicide Ideation [112]; STAXI: State Trait Anger Expression Inventory [113]; WISPI: Wisconsin Personality Disorder Inventory [39]

Table 3: A summary of included studies investigating reflective functioning, interpretations, skills use, emotion regulation, experiential avoidance, personality organisation, and cognitive change.

operated differently in CT and STDP in terms of 'affective avoidance'; the degree to which the therapist attends to affect in the session [34]. Although in STDP a focus on affect was positively associated with symptom improvement, this was not the case in CT where the avoidance of affect led to better outcomes. These different results were explained by Ulvenes et al. [34] with reference to the different models of intervention and the potency of different aspects of the therapeutic bond. In this way, Ulvenes et al. [34] were able to provide a plausible and coherent explanation of their results and hence satisfy Nock's and Kazdin'scriterion [4,5]. These results overall are consistent with other studies which indicate that the operation of this potential mechanism of change varies according to treatment type.

Another study which investigated the role of the alliance in predicting treatment outcome was conducted by Marziali et al. [35]. In a subset of the sample participating in a Randomised Controlled Trial which compared individual and group psychotherapy, Marziali et al. [35] analysed patient ratings of the therapeutic alliance by 18 participants with BPD receiving individual psychotherapy. The results indicated that patient ratings of the alliance predicted all treatment outcomes at 12

months (social adjustment r=0.81, p<0.001; symptoms of depression r=0.57, p<0.05; overall symptomatology r= 0.65, p<0.01), and social adjustment scores only at 24 months (r=0.35, p<0.10). Interestingly, early (initial five sessions) and later (sessions 8,10,15,20) alliance scores were strongly associated with each other (r=0.78, p<0.0001) which suggests that treatment outcome could be predicted by this proposed mechanism at different stages throughout the intervention, and as early as the first session.

Goldman and Gregory [36] explored the role of the therapeutic alliance in 10 participants with comorbid BPD and Alcohol Use Disorder who completed Dynamic Deconstructive Psychotherapy. They found a significant relationship between positive ratings of the alliance and reliable changes in BPD symptoms (ρ=0.74, p<0.05). However, it was not clear if the observer version of the Working Alliance Inventory was scored by raters who were blinded to the purpose of the study and this may have introduced bias to the results [37]. In terms of satisfying the criteria for a mechanism of change, a strong association was reported between the alliance and symptom change yet similarly to other studies, correlational analysis rather than regression analysis means that causality could not be reliably established.

The role of the therapeutic alliance in predicting change at different stages during CT for 30 individuals with Avoidant Personality Disorder (APD) or Obsessive-Compulsive Personality Disorder (OCPD) was investigated by Strauss et al. [38]. They found that patient rated alliance scores at the second and fifth sessions were not related to early symptom change at session 17 as measured by the Wisconsin Personality Disorders Inventory (WISPI) or the Structured Clinical Interview for Personality Disorders (SCID-II), but were related to change on the Beck Depression Inventory (BDI) [39-41]. When controlling for early change in depression scores and the number of sessions completed, a hierarchical regression analyses demonstrated that higher early alliance ratings predicted improved post-intervention outcome on the SCID-II (r=-0.41 p<0.05), WISPI (r=-0.40, p<0.05), and BDI (r=-0.49, p<0.01). Strength of this study is the early first measurement of the alliance at session 2, which Strauss et al. [38] explained was in order to measure the alliance before symptom change occurred. In this way, the authors attempted to address Nock's and Kazdin's [4,5] criterion for a temporal relationship, and they satisfied other criteria including a strong association, experimental design, and consistency.

However, the role of the therapeutic alliance as a mechanism of change is challenged by the results of Gunderson et al. [42]. Their study of 33 women with BPD in long-term cognitive-behavioural and dynamic interventions revealed that ratings of the alliance were not related to symptom improvement. Unfortunately, a small sample and very basic statistical tests were weaknesses of the study and Gunderson et al. acknowledged that these may have undermined their ability to find an effect [42].

Overall, the evidence suggests that the therapeutic alliance appears to have a role in change processes across different psychotherapeutic interventions for personality disorder, and that this association between therapeutic alliance and treatment outcome may vary according to treatment type. Furthermore, this relationship may also vary according to type of personality disorder, as different personality disorders have been shown to systematically affect the quality of the alliance. Lingiardi et al. [43] studied the alliance in 47 patient-therapist dyads undertaking expressive-supportive psychotherapy and identified that therapist ratings of alliance were significantly lower in relation to Cluster B patients compared to their alliance ratings in relation to Cluster A or Cluster C patients. These lower ratings for Cluster B patients may reflect that this group are sometimes viewed as 'heart sink' patients [44]. In contrast, patient ratings of alliance were significantly lower by Cluster A patients compared to alliance ratings by Cluster B or Cluster C patients. The lower ratings by Cluster A patients makes sense clinically if their typical presentation is considered: a lack of interest in social relationships and mistrust of others [10]. The differences in alliance ratings according to type of personality disorder are important in developing our understanding about how mechanisms of change may operate differently across types of personality disorder. Furthermore, this difference in how the patient and therapist experience the therapeutic relationship highlights the importance of rating the alliance from both sides of the relationship.

Rupture resolution

Another possible mechanism of change is the resolution of ruptures in the alliance. Rupture refers to "the tension or breakdown in the collaborative relationship between therapist and patient" and although a normal part of relationships, they are thought to mark potential change events [45-47]. Three relevant empirical papers were identified.

Bennett et al. [46] developed a nine stage model of rupture resolution for Cognitive Analytic Therapy (CAT) which included stages moving from acknowledgement, through understanding and assimilating warded off feelings, to closure. Daly et al. [48] tested this model by investigating ruptures in the therapeutic alliance for 5 adolescents with BPD undertaking CAT. They reported that level of adherence to the model was positively associated with increased rupture resolution, and there was a significant relationship between positive treatment outcome and having treatment sessions where ruptures were resolved (p=0.03); the criteria of strong association and temporal relation were met. They concluded that rupture resolution may be an "important ingredient of effective treatment", yet their sample did not include people who had not experienced any rupture. However, it may be the case that ruptures are a normal part of all therapeutic relationships and hence comparing treatment outcome between those who do and do not experience ruptures is not possible.

Strauss et al. [38] identified that 'rupture-repair' episodes were experienced by 56% of their sample in CT, and were significantly related to post-treatment scores on the WISPI (r=0.53, p<0.01) and BDI (r=-.49, p<.05) [39,41]. The 14 participants who experienced a rupture-repair episode demonstrated a 50% or greater reduction on the SCID-II, and 93% of them experienced this degree of change on the WISPI also [40]. Less than half of the group who did not experience a rupture-repair episode demonstrated this level of symptom change. Therefore, although it may seem to clinicians that alliance rupture is not a positive thing, the research suggests that resolving rupture facilitates therapeutic gains [49].

Muran et al. [50] investigated rupture resolution in 128 individuals with Cluster C personality disorders who were randomly assigned to one of three 30-session treatments (Table 2). Rupture resolution was positively associated with higher ratings of the therapeutic alliance and with session smoothness, but not strongly associated with treatment outcome. Patient and therapist ratings of the alliance however were positively associated with change in symptomatology (patient-rated alliance r=0.45, p<0.01; therapist-rated alliance r=0.38, p<0.01). Muran et al. [50] acknowledged the possibility that personality pathology may account for the relationship between poorer alliance and less favourable treatment outcome; further evidence for rupture resolution as a mechanism of change is required, and particularly that which can demonstrate the specificity of this potential mechanism.

Therapist interpretations

Psychodynamic and psychoanalytic psychotherapies view the use of transference interpretations as a powerful technique in promoting therapeutic change. Transference refers to the unconscious process whereby an individual transfers "feelings and attitudes from a person or situation in the past to a person or situation in the present" in a way that is not entirely appropriate to the present circumstances [51]. Non-transference interpretations do not refer to the patient-therapist relationship but can address a patient's internal conflict or difficulty. They are designed to offer insight beyond the patient's current level of awareness, such as recognition that the patient may be feeling anger, and not sadness as they describe [52]. Three papers investigating interpretation as a mechanism of change met the inclusion criteria.

In a quasi experimental study of 15 patients with different personality disorders undergoing brief dynamic psychotherapy, Hoglend [53] compared dynamic change and symptom change between those who received transference interpretations with those who did not receive any. In accordance with modified criteria for assessing suitability for receiving transference interpretations, only four of the fifteen patients were assessed as suitable for receiving transference interpretations [54]. Hoglend [53] adjusted for this deliberate non-equivalence in the analysis and found that the group which received interpretations were not rated as improved on any outcome measure. This was in contrast to the results of the group who did not receive any transference interpretations, where the majority were evaluated as 'much improved'. However, Hoglend [53] did not report whether pre-intervention symptom scores were similar across the two groups. A hierarchical multiple regression analysis revealed a significant negative effect of transference interpretations in relation to dynamic change, including interpersonal relations, self-esteem, and self-understanding, (r^2 change=0.42, $p<0.05$), but there was no significant relationship with symptom change. The small sample size compromises the reliability and validity of these findings, yet the experimental design allowed manipulation of the delivery of transference interpretations and this is crucial when investigating mechanisms of change [4,5].

McCullough et al. [55] investigated three types of therapist interventions: transference interpretations, non-transference interpretations, and clarification, which referred to the therapist restating or reflecting something the patient was already conscious of. Their sample consisted of 16 participants who had completed up to 53 sessions of brief psychotherapy. Four sessions from each participant were coded according to the type of therapist intervention and whether the patient response which followed was defensive or an expression of affect. McCullough et al. [55] demonstrated that all therapist interventions which were followed by patient defensiveness were significantly associated with negative outcome, whilst transference interpretations followed by affective responding from the patient were significantly associated with positive outcome ($r=0.60$, $p<0.05$). Therefore, it appears that the effectiveness of this potential mechanism of change depends upon how a patient responds to the transference interpretation. However, it is not clear whether the interpretations caused poor outcome; other factors may have influenced a patient's response to interpretations specifically, and to therapy more generally, which may have made them vulnerable to a poor outcome anyway.

In a sample of 14 patients with APD undergoing psychodynamic psychotherapy, Schut et al. [52] found an inverse relationship between the concentration of interpretations and improvements on the WISPI ($r=0.62$, $p<0.05$) and the GAF ($r=-0.50$, $p<0.10$). However, it might be the case that more interpretations were delivered in these cases because participants were experiencing higher levels of distress initially. Interpretations were associated with positive change when they were made in mutually affiliative patient-therapist interactions, which indicate that the quality of the relationship should be considered by therapists when making interpretations.

Overall, the empirical support for interpretations as a mechanism of change lacks consistency, and plausibility and coherence, as it has not been reliably established for whom interpretations could be consistently helpful and why this is the case. Although the studies employed experimental designs and aimed to explore the specificity of different types of interpretation upon outcome, a strong association and statistical mediation between interpretations and treatment outcomes needs to be more reliably established if interpretations are to be considered a mechanism or mediator of change.

Reflective functioning

Reflective functioning is the operationalized measure of mentalizing, which refers to an individual's ability to interpret their behaviours and the behaviours of others as meaningful in relation to mental states [56]. Although Mentalization-Based Treatment makes explicit what is being targeted in treatment by its name, mentalizing may be part of the change process in other treatments: Bateman and Fonagy [57] "make no claims of uniqueness" about this potential mechanism of change. Two relevant empirical papers were identified [24].

Levy et al. [1] investigated changes in reflective function and attachment patterns in 90 patients with BPD randomly assigned to TFP, DBT, and supportive psychotherapy. Significant increases in reflective function, attachment security, and attachment coherence were evident in the TFP group compared to the DBT and supportive psychotherapy groups. Treatment outcome was reported in another paper and revealed that all three treatments were associated with positive outcomes across 6 outcome domains (suicidality, aggression, impulsivity, anxiety, depression, social adjustment) [58]. TFP predicted improvement in 10 out of 12 possible outcome variables, whereas DBT and SPT were associated with improvement in only five or six outcome variables respectively. When reflective functioning at the beginning of treatment was controlled for, there was a significant effect of treatment condition on reflective functioning at the end of treatment ($F_{(3,54)}=15.05$, $p<0.05$, $r=0.89$). The TFP group demonstrated significantly increased reflective functioning compared to DBT ($t_{(54)}=2.10$, $p<0.05$, $r=0.27$) and SPT ($t_{(54)}=3.24$, $p<0.05$, $r=0.39$). It might be the case that superior treatment outcomes for TFP were related to the significantly greater increases in reflective function, attachment security, and attachment coherence evident in that group. Unfortunately, this study failed to directly investigate the criterion of strong association, as the analysis of treatment outcome was conducted independently of the investigation into mechanisms of change. However, the results between groups suggest that similar to the operation of the therapeutic alliance, the degree to which reflective functioning contributes to the overall change process may vary according to treatment type. This contrasts to the assertion of Bateman and Fonagy [57] that mentalizing is the mechanism by which all psychotherapies effect change.

The role of reflective functioning in change processes was not supported by the results of Vermote et al. [59]. They explored the relationship between symptom change and self- and object-relations, reflective functioning, and felt safety, for 44 patients with any personality disorder undergoing a psychodynamic hospital-based treatment program. Although there was a linear increase in self- and object- relations and in felt safety, this was not observed for reflective

functioning. Symptoms decreased significantly during the intervention yet Vermote et al. [59] did not find a relationship between this symptom change and reflective functioning.

Overall, the current empirical evidence cannot robustly support mentalizing or reflective functioning, as a mechanism of change operating across interventions for personality disorder. It should be noted that a significant limitation of research into mentalizing and reflective functioning, similar to other mechanisms of change, is the difficulty in measuring such a process.

Skills use

Skills use has been identified as a mechanism of change and has received most attention in relation to DBT where the 'skills' refer to the primary skill sets of mindfulness, distress tolerance, emotional regulation, and interpersonal effectiveness [60]. However, it has been explicitly stated that skills use can be considered a universal mechanism of change across interventions [61]. Three relevant papers were identified, one of which investigated emotion regulation only.

Neacsiu et al. [62] found that for 108 women with BPD in DBT or CTBE, overall skills use fully mediated improvements in anger control (β=1.25, $p<0.01$), depression (β=-1.55, $p<0.10$), and suicidal behaviours (β=0.76, $p<0.05$), and partially mediated a decrease in non-suicidal self-injury behaviours (β=0.94, $p<0.01$). This pattern of full or partial mediation indicates that certain mechanisms of change might be more or less potent in relation to some treatment outcomes compared to others. Of merit, Neacsiu et al. [61] used statistical mediation to demonstrate this strong association between skills use and treatment outcome. This association was evident for both DBT and the comparison interventions, yet level of skills use was significantly higher in the DBT group which is consistent with the gradient criterion [4,5].

A weakness of the study by Neacsiu et al. [61,62] is that it is not clear whether specific skills, such as emotional regulation, are more or less important in the change process than other skills, such as mindfulness. Indeed, in a review of RCTs for DBT, it was identified that very few studies 'dismantle' the different components [60]. Therefore, the relative influence of different skill sets upon change processes is unclear.

However, Perroud et al. [63] attempted to address this lack of specificity in relation to the skill set of mindfulness which they organised according to four discrete skills: observing, describing, acting with awareness, and accepting without judgment. In 52 patients with BPD who completed a four week intensive DBT course followed by one year of DBT, Perroud et al. [63] found a non-significant decrease in BPD symptoms over the course of treatment which appeared to be related to a significant increase in 'accepting without judgment' (β=-0.22, $p<0.05$). However, the association was no longer significant after controlling statistically for multiple tests and therefore criteria for establishing a mechanism of change were not satisfied here.

The skill of emotion regulation has been specifically investigated within a 20 week DBT intervention for 27 females with BPD and substance dependence [64]. A one way repeated measures analysis of variance indicated that a significant reduction in substance use at the end of treatment could be accounted for by improved emotion regulation ($F_{(1,21)}$=8.20, $p<0.01$). Conversely, improved mood could not account for reduced substance use which suggests the specificity of emotion regulation as a potential mechanism of change.

Experiential avoidance

Experiential avoidance refers to an individual aiming to avoid aversive experiences, such as particular private thoughts, feelings, memories, and behavioural dispositions, through employing potentially problematic behaviours including self-harm [65]. There is evidence that experiential avoidance is linked to BPD [66]. One study was identified which investigated experiential avoidance as a potential mechanism of change in psychotherapeutic treatment.

In 81 females with BPD who completed DBT or treatment by experts (TBE), Berking et al. [67] explored the relationship between experiential avoidance and symptoms of depression. There was a strong correlation between experiential avoidance, as measured by the Acceptance and Action Questionnaire (AAQ), and the BDI (r=0.85, $p<.001$) and HRSD (r=0.85, $p<0.001$) [41,65,68]. Using latent difference score models, Berking et al. [67] demonstrated that a reduction in experiential avoidance was significantly associated with subsequent changes in BDI and HRSD scores. Unfortunately, they did not explore the relationship between experiential avoidance and other outcomes which makes it difficult to elucidate the potential potency of this mechanism of change in treatments for personality disorder more generally. Of merit however, the AAQ, BDI, and HRSD were administered every four months throughout treatment which allows a temporal relationship to be explored.

Personality organisation

It has been proposed that different levels of personality organisation (psychotic, borderline, neurotic, and mature) can be identified according to an individual's identity formation and consolidation, internal object relations, defense mechanisms, and their capacity to perceive the outside world realistically [69]. Importantly, Kernberg [70] asserted that psychotherapeutic intervention could lead to change at the level of symptoms, and additionally at the level of personality organisation. One relevant paper investigating this potential mechanism of change was identified.

Arntz and Bernstein [71] reported on the findings obtained as part of the effectiveness study of Giesen-Bloo et al. [72]. In three years of treatment in either SFT or TFP, 86 participants with BPD demonstrated significant changes in personality organisation, as measured by the Inventory of Personality Organisation (IPO) [73]. Of importance for this review, changes on the IPO from the beginning of treatment to the end of treatment were strongly correlated with changes in BPD symptomatology (ρ=0.61, $p<0.001$). It is positive that the IPO was administered throughout the course of treatment at six monthly intervals, and the scores indicated that SFT was superior to TFP in both IPO and BPD symptom scores. The correlation between changes in personality organisation and BPD symptomatology persisted when pre-treatment scores were controlled for. Therefore, a strong association between IPO and treatment outcome has been established in two treatments for personality disorder, yet replication is required.

Cognitive change

Cognitive change, such as changing dysfunctional core beliefs or schemas, is deemed a key change process in SFT and CT, and yet there was a lack of empirical research explicitly testing this in interventions for personality disorder [74,75]. A clinical trial of CT for people with BPD demonstrated a significant reduction in dysfunctional core beliefs by the end of treatment, yet this was not significantly associated with treatment outcome [76]. As a minimum, a strong association would need to be established in further studies if cognitive change is to be considered a possible mechanism of change in interventions for

personality disorder.

Discussion

Overview of results

This review has identified potential mechanisms of change operating across psychotherapeutic interventions for personality disorder, and has highlighted the varying amounts of research which these different mechanisms have received. The included studies varied in terms of sample size, quality, and scientific rigour. Unfortunately, small sample sizes were a common weakness and may have undermined the ability of studies to perform appropriate statistical analyses and find an effect. In terms of Nock's and Kazdin's criteria for establishing a mechanism of change, there were often too few studies to satisfy these criteria 'in concert' and correlational study designs were a limitation as robust causal relationships could not be established [4,5]. Furthermore, with the exception of the study by Lingiardi et al. [43] which demonstrated that type of personality disorder affected the quality of the alliance, the majority of research studies did not investigate possible moderating effects of type of personality disorder upon different mechanisms of change.

The role of the therapeutic alliance has received the most empirical support and overall, the studies were able to endorse Nock's and Kazdin's criteria for establishing a mechanism of change [4,5]. The resolution of alliance rupture also received empirical support as a possible mechanism of change, yet the specificity of this potential mechanism and its unique contribution to change processes independent of the effect of the therapeutic alliance needs further exploration.

Other potential mechanisms of change have somewhat limited evidence for their universal operation. For example, reflective functioning, interpretations, skills use, and experiential avoidance may have some credibility as possible mechanisms, but appear to be associated with particular treatment types rather than being viewed as potentially relevant to all. Furthermore, there appear to be significant gaps in the research literature given that some mechanisms of change, such as cognitive change, appear to have a theoretical rationale for their operation and yet the empirical evidence currently fails to satisfy even minimum criteria by Nock and Kazdin [4,5,75].

Clinical implications

The findings of this review suggest that there may be particular mechanisms of change, such as the therapeutic alliance, which operate across different interventions for personality disorder. Therefore, the clinical implications of such research are likely to extend beyond single treatment models. Indeed, the evidence indicates that all therapists should attend carefully to the development of the therapeutic relationship from the start of treatment, and be aware that the alliance may be experienced differently by patients compared to themselves, and particularly more negatively so by those with Cluster A personality disorder. Furthermore, with reference to the wider literature about mechanisms of change, the findings of this review support the current evidence for the therapeutic alliance as a non-specific treatment mechanism. For instance, in a systematic review of factors predicting outcome in treatments for BPD, Barnicot et al. [77] concluded that patient-rated alliance consistently and strongly predicted symptom change.

The evidence for rupture resolution indicates that interventions could be enhanced by the inclusion of models of how to repair ruptures in clinical practice. These models could enable therapists to feel more confident and competent in responding to these potential change events, and improved treatment outcomes following adherence to such models would support the operation of this mechanism of change.

There are fewer studies investigating other mechanisms of change, and increased measurement of potential mechanisms in clinical practice is required in order to help elucidate change processes and work towards enhancing treatment effectiveness. Understanding more about when and how to employ different mechanisms of change could enable interventions to be delivered in the most effective way possible and for treatment gains to be maximised. This is particularly relevant given the results about the therapeutic alliance whereby it may be the case that treatment type moderates the operation of a mechanism of change. Furthermore, given that McCullough et al. [55] found that therapist interpretations followed by patient defensiveness were associated with negative outcomes, it is possible that change processes not being employed appropriately could be associated with iatrogenic harm, and this also requires understanding.

Future research

In general, future research would benefit from ensuring that studies endorse Nock's and Kazdin's criteria for establishing a mechanism of change [4,5]. In particular, although it is necessary to demonstrate a strong association between a proposed mechanism and treatment outcome, it should also be a priority to establish a temporal relationship and statistical mediation in order to demonstrate causality rather than merely a correlation. This is particularly relevant in light of recent findings that there may be a reciprocal causal relationship between the therapeutic alliance and symptomatology: Falkenstrom et al. [78] reported such a finding in their study of 646 patients who had received primary care psychotherapy. In addition, investigating the 'dose-response relationship' between a mechanism of change and outcome would advance understanding about the optimum operation of different mechanisms of change.

With regards to specific mechanisms of change, investigating the role of the alliance in different psychotherapies using a between-groups design would permit tracking of the different trajectories of the therapeutic alliance, and explore further any interaction with treatment type. In addition, Strauss et al. [38] suggested that patients who experience an unresolved rupture of the alliance should be studied carefully to understand what happens when a potential change event is not harnessed effectively. Studies like this would enable the potency of different mechanisms to be investigated.

Further research into reflective functioning, or mentalizing, and interpretations, is required as the empirical evidence for these lacks consistency at present. In addition, empirical research about experiential avoidance and cognitive change is essential given that only one study investigating each of these was identified. With regards to skills use, the specificity of this mechanism has not been researched as to whether "use of emotion regulation skills actually improves emotional regulation" and studies which could clarify this are needed [61]. Research exploring the relative contribution of potential mechanisms of change to outcome is also required.

No empirical studies were identified which investigated defensive functioning as a possible mechanism of change in interventions for personality disorder. However, Bond and Perry [79] demonstrated that in a sample of 53 patients (40 of whom had a personality disorder) undergoing long-term psychodynamic psychotherapy, overall defensive functioning improved and predicted up to 21.8% variance in symptom

outcome. Therefore, this could be a potential mechanism of change warranting further research in the domain of personality disorder interventions.

Research into mechanisms of change could be advanced by not only appealing to researchers and clinicians to be involved in such research, but ensuring that people with personality disorder are also represented in this literature. Given that this is the population for whom mechanisms of change are being investigated, it follows that their perspectives about the key ingredients of an intervention could be extremely valuable.

Limitations of this review

The breadth of this review, incorporating a variety of treatments for personality disorder, means that the depth of information about the specific operation of mechanisms of change in particular interventions may have been compromised. The breadth of material was prioritised over the depth of information in order to explore the universal nature of mechanisms of change across treatments. In addition, this review focused upon the potential mechanisms of change operating across individual interventions for people with personality disorder, which may not reflect the mechanisms of change in group interventions for this population. Furthermore, this review focused upon potential mechanisms of change which had been explored empirically; many other mechanisms of change may exist that have not yet been investigated. It is also worth noting that the diversity of characteristics and psychopathology captured by the term 'personality disorder' means that the findings in this review are all tempered to some degree by the heterogeneity evident within this population.

Conclusion

This review has provided an overview of potential mechanisms of change operating across psychotherapeutic interventions for personality disorder, and demonstrated that the therapeutic alliance and resolution of its rupture appear key mechanisms of change. Overall, the quality of studies was variable, and the number of studies was somewhat limited. Nevertheless, a research base regarding mechanisms of change in treatments for personality disorder is being established, albeit slowly, and such research undoubtedly recognises that personality disorder is no longer a diagnosis of exclusion [80]. As the evidence base for the effectiveness of interventions continues to grow, it is imperative that attention is given to the mechanisms of change facilitating treatment gains. It is not enough to know 'what works', but to understand how it works and for whom.

References

1. Clarkin JF, Levy KN (2006) Psychotherapy for patients with borderline personality disorder: focusing on the mechanisms of change. J ClinPsychol 62: 405-410.
2. Kazdin AE (2009) Understanding how and why psychotherapy leads to change. Psychother Res 19: 418-428.
3. Gibbons MB, Crits-Christoph P, Barber JP, WiltseyStirman S, Gallop R, et al. (2009) Unique and common mechanisms of change across cognitive and dynamic psychotherapies. J Consult Clin Psychol 77: 801-813.
4. Nock MK (2007) Conceptual and design essentials for evaluating mechanisms of change. Alcohol ClinExp Res 31: 4s-12s.
5. Kazdin AE (2007) Mediators and mechanisms of change in psychotherapy research. Annu Rev ClinPsychol 3: 1-27.
6. Johannson P, Hoglend P (2007) Identifying mechanisms of change in psychotherapy: Mediators of treatment outcome. Clinical Psychology and Psychotherapy 14: 1-9.
7. Kraemer HC, Wilson GT, Fairburn CG, Agras WS (2002) Mediators and moderators of treatment effects in randomized clinical trials. Arch Gen Psychiatry 59: 877-883.
8. Clarkin JF, Levy KN (2003) The influence of client variables on psychotherapy. In: Bergin and Garfield's handbook of psychotherapy and behaviour change. (5th Edn.), John Wiley and Sons, USA, P: 194-226.
9. World Health Organisation (2007a) The international statistical classification of diseases and related health problems.
10. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders. (5thedn), Washington.
11. American Psychiatric Association (2000) Diagnostic and statistical manual of mental disorders. (4thedn), Washington.
12. World Health Organization (2007b) The ICD-10 classification of mental and behavioural disorders. Clinical descriptors and diagnostic guidelines.
13. Tyrer P, Coombs N, Ibrahimi F, Mathilakath A, Bajaj P, et al. (2007) Critical developments in the assessment of personality disorder. Br J Psychiatry Suppl 49: s51-59.
14. Pretzer JL, Beck AT (2005) A cognitive theory of personality disorders. In MF Lenzenweger& JF Clarkin (Eds.), Major Theories of Personality Disorder, (2nd Edn.), The Guilford Press, New York.
15. Bierer LM, Yehuda R, Schmeidler J, Mitropoulou V, New AS, et al. (2003) Abuse and neglect in childhood: relationship to personality disorder diagnoses.CNS Spectr 8:737-754.
16. Ruocco AC (2005) The neuropsychology of borderline personality disorder: a meta-analysis and review. Psychiatry Res 137: 191-202.
17. Carlson EA, Egeland B, Sroufe LA (2009) A prospective investigation of the development of borderline personality symptoms. Dev Psychopathol 21: 1311-1334.
18. Fonagy P, Bateman A (2008) The development of borderline personality disorder--a mentalizing model. J Pers Disord 22: 4-21.
19. Clarkin JF, Yeomans FE, Kernberg OF (1999) Psychotherapy for borderline personality. John Wiley and Sons, New York.
20. Davidson K (2007) Cognitive therapy for personality disorders. A guide for clinicians (2nd Edn.), Routledge.
21. Ryle A, Kerr IB (2002) Introducing cognitive analytic therapy. In: Principles and practice. Wiley-Blackwell, England.
22. Young JE, Klosko JS, Weishaar HG (2003) Schema therapy: A practitioner's guide. The Guilford Press, New York.
23. Linehan MM (1993) Skills training manual for treating borderline personality disorder. Guilford Press, New York.
24. Bateman AW, Fonagy P (2006) Mentalization–based treatment for borderline personality disorder: A practical guide. Oxford University Press, Oxford.
25. McGlashan TH, Grilo CM, Skodol AE, Gunderson JG, Shea MT, et al. (2000) The Collaborative Longitudinal Personality Disorders Study: baseline Axis I/II and II/II diagnostic co-occurrence. ActaPsychiatrScand 102: 256-264.
26. Zanarini MC, Frankenburg FR, Hennen J, Reich DB, Silk KR (2006) Prediction of the 10-year course of borderline personality disorder. Am J Psychiatry 163: 827-832.
27. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, et al. (2009) The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 6: e1000100.
28. Westen D, Shedler J, Durrett C, Glass S, Martens A (2003) Personality diagnoses in adolescence: DSM-IV axis II diagnoses and an empirically derived alternative. Am J Psychiatry 160: 952-966.
29. Centre for Reviews and Dissemination (2008). Systematic reviews: CRD's guidance for undertaking reviews in healthcare. University of York.
30. Safran JD, Muran JC (2006) Has the concept of the therapeutic alliance outlived its usefulness? Psychotherapy (Chic) 43: 286-291.
31. Bordin E (1979) The generalizability of the psychoanalytic concept of working alliance. Psychotherapy: Theory, Research, and Practice 16: 252-260.

32. Spinhoven P, Giesen-Bloo J, van Dyck R, Kooiman K, Arntz A (2007) The therapeutic alliance in schema-focused therapy and transference-focused psychotherapy for borderline personality disorder. J Consult ClinPsychol 75: 104-115.

33. Bedics JD, Atkins DC, Comtois KA, Linehan MM (2012) Treatment differences in the therapeutic relationship and introject during a 2-year randomized controlled trial of dialectical behaviour therapy versus non-behavioural psychotherapy experts for borderline personality disorder. J Consult Clin Psychol 80: 66-77.

34. Ulvenes PG, Berggraf L, Hoffart A, Stiles TC, Svartberg M, et al. (2012) Different processes for different therapies: therapist actions, therapeutic bond, and outcome. Psychotherapy (Chic) 49: 291-302.

35. Marziali E, Munroe-Blum H, McCleary L (1999) The effects of the therapeutic alliance on the outcomes of individual and group psychotherapy with borderline personality disorder. Psychotherapy Research 9: 424-436.

36. Goldman GA, Gregory RJ (2010) Relationships between techniques and outcomes for borderline personality disorder. Am J Psychother 64: 359-371.

37. Tracey TJ, Kokotovic AM (1989) Factor structure of the Working Alliance Inventory. Psychological Assessment 1: 207-210.

38. Strauss JL, Hayes AM, Johnson SL, Newman CF, Brown GK, et al. (2006) Early alliance, alliance ruptures, and symptom change in a nonrandomized trial of cognitive therapy for avoidant and obsessive-compulsive personality disorders. J Consult Clin Psychol 74: 337-345.

39. Klein MH, Benjamin LS, Rosenfeld R, Treece C, Husted J, et al. (1993) The Wisconsin personality disorders inventory: Development, reliability, and validity. Journal of Personality Disorders 7: 285-303.

40. Spitzer RL, Williams JBW, Gibbon M, First MB (1990) Structured Clinician Interview for DSM-III-R Axis II Disorders (SCID-II). American Psychiatric Press, Washington.

41. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J (1961) An inventory for measuring depression. Arch Gen Psychiatry 4: 561-571.

42. Gunderson J, Najavits L, Leonhard C, Sullivan C, Sabo A (1997) Ontogeny of the therapeutic alliance in borderline patients. Psychotherapy Research 7: 301-309.

43. Lingiardi V, Filippucci L, Baiocco R (2005) Therapeutic alliance evaluation in personality disorders. Psychotherapy Research 15: 45-53.

44. Schafer S, Nowlis PD (1998) Personality disorders among different patients. Archives of Family Medicine 7: 126 -129.

45. Safran JD, Muran JC, Samstag LW, Stevens C (2002) Repairing alliance ruptures. In JC Norcross (Edr.), Psychotherapy and relationships that work: Therapist contributions and responsiveness to patients. Oxford University Press, New York.

46. Bennett D, Parry G, Ryle A (2006) Resolving threats to the therapeutic alliance in cognitive analytic therapy of borderline personality disorder: a task analysis. PsycholPsychother 79: 395-418.

47. Rice L, Greenberg L (1984) Patterns of change: Intensive analysis of psychotherapy process. Guilford Press, New York.

48. Daly AM, Llewelyn S, McDougall E, Chanen AM (2010) Rupture resolution in cognitive analytic therapy for adolescents with borderline personality disorder. Psychol Psychother 83: 273-288.

49. Coutinho J, Ribeiro E, Hill C, Safran J (2011) Therapists' and clients' experiences of alliance ruptures: a qualitative study. Psychother Res 21: 525-540.

50. Muran JC, Safran JD, Gorman BS, Samstag LW, Eubanks-Carter C, et al. (2009) The relationship of early alliance ruptures and their resolution to process and outcome in three time-limited psychotherapies for personality disorders. Psychotherapy (Chic) 46: 233-248.

51. Hughes P, Kerr I (2000) Transference and countertransference in communication between doctor and patient. Advances in Psychiatric Treatment 6: 57-64.

52. Schut A J, Castonguay L G, Flanagab KM, Yamasaki A S, Barber J P, et al. (2005) Therapist interpretation, patient-therapist interpersonal process, and outcome in psychodynamic psychotherapy for avoidant personality disorder. Psychotherapy: Theory, Research, Practice, Training 42: 494-511.

53. Hoglend P (1996) Analysis of transference in patients with personality disorders. Journal of Personality Disorders 10: 122-131.

54. Sifneos P (1979) Short-term dynamic psychotherapy. Plenum Press, New York.

55. McCullough L, Winston A, Farber B A, Porter F, Pollack J, et al. (1991) The relationship of patient-therapist interaction to outcome in brief psychotherapy. Psychotherapy: Theory, Research, Practice, Training 28: 525-533.

56. Bateman AW, Fonagy P (2004) Mentalization-based treatment of BPD. J Pers Disord 18: 36-51.

57. Bateman A, Fonagy P (2010) Mentalization based treatment for borderline personality disorder. World Psychiatry 9: 11-15.

58. Clarkin JF, Levy KN, Lenzenweger MF, Kernberg OF (2007) Evaluating three treatments for borderline personality disorder: a multiwave study. Am J Psychiatry 164: 922-928.

59. Vermote R, Lowyck B, Luyten P, Vertommen H, Corveleyn J, et al. (2010) Process and outcome in psychodynamic hospitalization-based treatment for patients with a personality disorder. J NervMent Dis 198: 110-115.

60. Lynch TR, Trost WT, Salsman N, Linehan MM (2007) Dialectical behavior therapy for borderline personality disorder. Annu Rev Clin Psychol 3: 181-205.

61. Neacsiu AD, Rizvi SL, Linehan MM (2010) Dialectical behavior therapy skills use as a mediator and outcome of treatment for borderline personality disorder. Behav Res Ther 48: 832-839.

62. Neacsiu AD, Rizvi SL, Vitaliano PP, Lynch TR, Linehan, MM (2010) The dialectical behavior therapy ways of coping checklist (DBT-WCCL): Development and psychometric properties. Journal of Clinical Psychology 6: 1-20.

63. Perroud N, Nicastro R, Jermann F, Huguelet P (2012) Mindfulness skills in borderline personality disorder patients during dialectical behavior therapy: preliminary results. Int J Psychiatry Clin Pract 16: 189-196.

64. Axelrod SR, Perepletchikova F, Holtzman K, Sinha R (2011) Emotion regulation and substance use frequency in women with substance dependence and borderline personality disorder receiving dialectical behavior therapy. Am J Drug Alcohol Abuse 37: 37-42.

65. Hayes SC, Strosahl K, Wilson KG, Bissett RT, Pistorello J, et al. (2004) Measuring experiential avoidance: A preliminary test of a working model. The Psychological Record 54: 553-578.

66. Chapman AL, Specht MW, Cellucci T (2005) Borderline personality disorder and deliberate self-harm: does experiential avoidance play a role? Suicide Life Threat Behav 35: 388-399.

67. Berking M, Neacsiu A, Comtois KA, Linehan MM (2009) The impact of experiential avoidance on the reduction of depression in treatment for borderline personality disorder. Behav Res Ther 47: 663-670.

68. Miller IW, Bishop S, Norman WH, Maddever H (1985) The Modified Hamilton Rating Scale for Depression: reliability and validity. Psychiatry Res 14: 131-142.

69. Kernberg OF (1976) Object relations theory and clinical psychoanalysis. Jason Aronson, New York.

70. Kernberg OF (1996) Psychoanalytic theory of personality disorders. In JF Clarkin & MF Lenzenweger (Edr.), Major theories of personality disorder. Guilford, New York & London.

71. Arntz A, Bernstein D (2006) Can personality disorders be changed? Netherlands Journal of Psychology 62: 8-18.

72. Giesen Bloo J, van Dyck R, Spinhoven P, van Tilburg W, Dirksen C, et al. (2006) Outpatient psychotherapy for borderline personality disorder: A randomized trial of schema-focused therapy vs transference-focused psychotherapy. Archives of General Psychiatry 63: 649-658.

73. Lenzenweger MF, Clarkin JF, Kernberg OF, Foelsch PA (2001) The inventory of personality organization: Psychometric properties, factorial composition, and criterion relations with affect, aggressive dyscontrol, psychosis proneness, and self domains in a non-clinical sample. Psychological Assessment 13:577–591.

74. Kellogg SH, Young JE (2006) Schema therapy for borderline personality disorder. J ClinPsychol 62: 445-458.

75. Wenzel A, Chapman JE, Newman CF, Beck AT, Brown GK (2006) Hypothesized mechanisms of change in cognitive therapy for borderline personality disorder. J Clin Psychol 62: 503-516.

76. Brown GK, Newman CF, Charlesworth SE, Crits-Christoph P, Beck AT (2004)

An open clinical trial of cognitive therapy for borderline personality disorder. J Pers Disord 18: 257-271.

77. Barnicot K, Katsakou C, Bhatti N, Savill M, Fearns N, et al. (2012) Factors predicting the outcome of psychotherapy for borderline personality disorder: a systematic review. Clin Psychol Rev 32: 400-412.

78. Falkenström F, Granström F, Holmqvist R (2013) Therapeutic alliance predicts symptomatic improvement session by session. J Couns Psychol 60: 317-328.

79. Bond M, Perry JC (2004) Long-term changes in defense styles with psychodynamic psychotherapy for depressive, anxiety, and personality disorders. Am J Psychiatry 161: 1665-1671.

80. National Institute for Mental Health in England (2003) Personality disorder: No longer a diagnosis of exclusion. London.

81. Jones EE (1985) Manual for the psychotherapy process Q-sort. Unpublished manuscript, University of California, Berkeley, CA.

82. Agnew-Davies R, Stiles WB, Hardy GE, Barkham M, Shapiro DA (1998) Alliance structure assessed by Agnew Relationship Measure (ARM). British Journal of Clinical Psychology 37: 155-172.

83. Pfohl B, Blum N (1997) Borderline evaluation of severity over time (BEST). IA: University of Iowa, Iowa City.

84. Arntz A, van den Hoorn M, Cornelis J, Verheul R, van den Bosch WM, et al. (2003) Reliability and validity of the borderline personality disorder severity index. J Pers Disord 17: 45-59.

85. Overall JE, Gorman GR (1962) The brief psychiatric rating scale. Psychological Reports 10: 799-812.

86. Gaston L (1991) Reliability and criterion-related validity of the patient version of the California Psychotherapy Alliance Scale. Psychotherapy Assessment 3: 68-74.

87. Guy W (1976) Clinical global impression. In: ECDEU assessment manual for psychopharmacology revised. Rockville, MD: National Institute of Mental Health, USA.

88. Hahn SR, Thompson KS, Wills TA, Stern V, Budner NS (1994) The difficult doctor-patient relationship: somatization, personality and psychopathology. J Clin Epidemiol 47: 647-657.

89. Endicott J, Spitzer RL, Fleiss JL, Cohen J (1976) The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. Arch Gen Psychiatry 33: 766-771.

90. Luborsky L (1976) Helping alliance in psychotherapy. In: J.L. Claghorn (Edr), Successful psychotherapy, Bruner-Mazel, New York.

91. Marziali E (1984) Three viewpoints on the therapeutic alliance. Similarities, differences, and associations with psychotherapy outcome. J Nerv Ment Dis 172: 417-423.

92. Weissman MM, Bothwell S (1976) Assessment of social adjustment by patient self-report. Arch Gen Psychiatry 33: 1111-1115.

93. Benjamin LS (1974). Structural analysis of social behaviour. Psychological Review 81: 392-425.

94. Linehan MM, Comtois KA, Brown MZ, Heard HL, Wagner A (2006) Suicide Attempt Self-Injury Interview (SASII): development, reliability, and validity of a scale to assess suicide attempts and intentional self-injury. Psychol Assess 18: 303-312.

95. Derogatis LR, Rickels K, Rock AF (1976) The SCL-90 and the MMPI: a step in the validation of a new self-report scale. Br J Psychiatry 128: 280-289.

96. Derogatis LR (1983) SCL-90R: Administration, scoring, & procedures manual II. Towson, MD: Clinical Psychiatric Research.

97. Stiles WB (1980) Measurement of the impact of psychotherapy sessions. J Consult Clin Psychol 48: 176-185.

98. Horvath AO, Greenberg LS (1989) Development and validation of the working alliance inventory. Journal of Counselling Psychology 36: 223-233.

99. Young JE (1994) Cognitive therapy for personality disorders: A schema-focused approach (Revised edition). Sarasota, FL: Professional Resource Press.

100. McCullough, L. (1988). Psychotherapy interaction coding system (PICS) manual. Social and Behavioural Sciences documents.

101. George C, Kaplan N, Main M (1985) Adult Attachment Interview. Unpublished manuscript. Department of Psychology, University of California, Berkeley.

102. Beck AT, Epstein N, Brown G, Steer RA (1988) An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol 56: 893-897.

103. Beck AT, Steer RA, Brown GK (1996) Manual for the Beck Depression Inventory. (2nd edition), San Antonio, TX: Psychological Corporation.

104. Beck AT, Steer RA (1993) Manual for the Beck Hopelessness Scale. San Antonio, TX: Psychological Corporation, New York.

105. Gratz KL, Roemer L (2004) Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale. Journal of Psychopathology and Behavioural Assessment 26: 41-54.

106. American Psychiatric Association (1987). Diagnostic and statistical manual of mental disorders (3rd edition revised). Washington DC: Author.

107. HAMILTON M (1960) A rating scale for depression. J Neurol Neurosurg Psychiatry 23: 56-62.

108. Baer RA, Smith GT, Allen KB (2004) Assessment of mindfulness by self-report: the Kentucky inventory of mindfulness skills. Assessment 11: 191-206.

109. Butler AC, Brown GK, Beck AT, Grisham JR (2002) Assessment of dysfunctional beliefs in borderline personality disorder. Behav Res Ther 40: 1231-1240.

110. Fonagy P, Target M, Steele H, Steele M (1998) Reflective functioning manual version 5 for application to adult attachment interviews.

111. Sansone RA, Wiederman MW, Sansone LA (1998) The Self-Harm Inventory (SHI): development of a scale for identifying self-destructive behaviors and borderline personality disorder. J Clin Psychol 54: 973-983.

112. Beck AT, Kovacs M, Weissman A (1979) Assessment of suicidal intention: the Scale for Suicide Ideation. J Consult Clin Psychol 47: 343-352.

113. Spielberger CD (1988) State trait anger expression inventory. Odessa, EL: Psychological Assessment Resources.

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