



# Schema therapy for borderline personality disorder: A comprehensive review of its empirical foundations, effectiveness and implementation possibilities



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## HIGHLIGHTS

- ▶ Offers both theoretical description and empirical review of the schema model for BPD.
- ▶ Evidence exists for a number of schema constructs and mechanisms.
- ▶ The extant efficacy studies show positive outcomes of schema therapy for BPD.
- ▶ Schema therapy seems a societal cost-effective approach.
- ▶ Further work is required to achieve full empirical support of the model and therapy.

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## ABSTRACT

Borderline personality disorder is a serious psychiatric disorder for which the effectiveness of the current pharmacotherapeutical and psychotherapeutic approaches has shown to be limited. In the last decades, schema therapy has increased in popularity as a treatment of borderline personality disorder; however, systematic evaluation of both effectiveness and empirical evidence for the theoretical background of the therapy is limited. This literature review comprehensively evaluates the current empirical status of schema therapy for borderline personality disorder. We first described the theoretical framework and reviewed its empirical foundations. Next, we examined the evidence regarding effectiveness and implementability. We found evidence for a considerable number of elements of Young's schema model; however, the strength of the results varies and there are also mixed results and some empirical blanks in the theory. The number of studies on effectiveness is small, but reviewed findings suggest that schema therapy is a promising treatment. In Western-European societies, the therapy could be readily implemented as a cost-effective strategy with positive economic consequences.

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*Abbreviations:* BPD, Borderline personality disorder; ST, Schema therapy; EMS, Early maladaptive schema; TFP, Transference focused psychotherapy; TAU, Treatment as usual; DBT, Dialectical behavior therapy; MBT, Mentalization based therapy; RCT, Randomized controlled trial.

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## 1. Introduction

Borderline personality disorder (BPD) is one of the most common (Maier, Lichtermann, Klingler, Heun, & Hallmayer, 1992) serious and challenging psychiatric disorders for both patient and therapist. BPD's core features, including impulsivity, negative affect, problematic relationships, incapacity of controlling intense, fluctuating emotions and lacking sense of self, cause major psychosocial impairment (American Psychiatric Association, 2000). The symptoms of BPD are clustered in two groups: the acute symptoms, including impulsivity, self-injurious and reckless behavior; and the temperamental symptoms, such as poor self esteem, fear of abandonment, distrust, and anger (Zanarini et al., 2007). Patients with BPD often experience crisis episodes, characterized by depression, anxiety, and (para) suicidal and self-injurious behavior, sometimes leading to hospitalization (Van Asselt, Dirksen, Arntz, & Severens, 2007). Substance abuse and other types of self-destructive behavior, like delinquency, unsafe sex and reckless driving might also be salient characteristics (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000), resulting in high rates of (non-)health related costs (American Psychiatric Association, 2001; Van Asselt et al., 2007).

The effectiveness of pharmacotherapy to treat BPD has shown to be limited and mostly based on single study effects (Lieb, Völlm, Rücker, Timmer, & Stoffers, 2010; Stoffers et al., 2010; Zanarini, 2004). Antidepressants and first-generation antipsychotics seem to have some beneficial effects on comorbid psychopathology, whereas second-generation antipsychotics and mood-stabilizers seem to contribute to reduction of affective dysregulation symptoms, and omega-3 fatty acids to reduction of suicidality. Yet none of the afore-mentioned drugs have shown to affect overall BPD severity nor the core symptoms, such as identity disturbance or feeling of emptiness (Stoffers et al., 2010). For this reason, psychotherapy is still the preferred treatment approach (APA, 2001); however, not without great difficulties. For instance, patients with BPD tend to instigate therapists' counter-transference reactions during sessions (Maltzberger & Buie, 1974); they often show retrocession in treatment (Gunderson & Kolb, 1978) and therapy dropout is high (67%; Gunderson et al., 1989). Furthermore, studies examining the efficacy of psychotherapy for BPD are still scarce to allow drawing strong conclusions (Stoffers et al., 2012).

Dialectical Behavior Therapy (DBT) is currently the most extensively studied and used approach to treat BPD (Heard & Linehan, 2005; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Linehan, 1993; Linehan, Cochran, & Kehrer, 2001; Zanarini, 2009). This type of cognitive-behavior therapy enhances adaptive behavior skills to cope with emotions, distress and interrelationship difficulties (Linehan, 1993). Dialectical Behavior Therapy has shown to be effective in randomized controlled trials (see Lynch, Trost, Salsman, & Linehan, 2007). The treatment has been shown in the past to be beneficial for anger, general mental health (Stoffers et al., 2012), suicidal and self-destructive behavior (Harned, Banawan, & Lynch, 2006; Linehan, Armstrong, Suarez, Allmond, & Heard, 1991; Linehan, Heard, & Armstrong, 1993; Linehan

et al., 1999; Stoffers et al., 2012) and, as a consequence, the number of hospitalizations (Harned et al., 2006; Linehan et al., 1991, 1993, 1999). Yet, according to recent (meta-)analyses, the effects of DBT on global symptoms as well as the effects on specific symptoms are moderate (Cohen's  $d \approx 0.50$ ; Kliem, Kröger, & Kosfelder, 2010; Stoffers et al., 2012).

Other two relatively well-studied psychological treatments for BPD are the Mentalization-Based Treatment (MBT) and the Transference Focused Psychotherapy (TFP), both psychodynamic approaches (Zanarini, 2009). MBT derives from the attachment and cognitive theory and hypothesizes that early attachment difficulties have led to impairments in the capacity of BPD patients to mentalize, in other words, to be aware of and understand their own and others' mental states. The therapy focuses on increasing mentalizing capacities to achieve stability of affect and impulses (Bateman & Fonagy, 2010). MBT has been found to be superior to Treatment as Usual (TAU) in two trials conducted by the developers of MBT (Bateman & Fonagy, 1999, 2009), where suicidality, parasuicidality, interpersonal problems and depression were significantly reduced with very large effects (Stoffers et al., 2010). A recent RCT, conducted by an independent team, found no evidence for superiority of MBT above a less intensive control treatment, supportive group therapy offered once every two weeks (Jørgensen et al., 2012). TFP aims to address the extreme, rigid and split off BPD internal representations of the self and others by focusing the attention of the treatment on analyzing and reframing the transference brought by the patient to the therapeutic relationship (Yeomans & Delaney, 2008). TFP has been found in a RCT superior to TAU (community treatment by experts) on overall BPD severity and attrition (Doering et al., 2010), but TFP did not lead to a complete improvement of the impulsivity features of BPD (Clarkin et al., 2007) nor general psychopathology and global functioning (Stoffers et al., 2012).

The aim to find a treatment that leads to strong positive changes in all facets of the disorder and related elements, like quality of life and social functioning, motivates the interest in finding alternatives for the treatment of BPD. One of the emerging alternatives is schema therapy (ST; Young & Klosko, 1993; Young, Klosko, & Weishaar, 2003). This treatment has evolved greatly over the last 20 years (Kellog & Young, 2006) and has lately received a lot of attention from the scientific community, particularly in The Netherlands, Scandinavia, and United Kingdom (Nordahl & Nysæter, 2005). Its increasing popularity is mainly due to the results of a RCT, where ST was found to have greater positive effects on a broader range of symptoms compared to TFP (Giesen-Bloo et al., 2006).

Theoretical principles of ST have recently been described with respect to BPD (Nysæter & Nordahl, 2008). However, review publications on both effectiveness and empirical evidence for the theoretical background of the therapy are lacking. At this point, it is important to evaluate the theoretical and empirical basis of ST before it can be considered as a well-established approach. Therefore, the current paper will address two questions. First, to what extent can an empirical foundation be found for the theoretical background of the schema model? Second, how effective and feasible is ST for the treatment of

BPD? To answer these questions, this paper will first describe the theoretical elements and techniques that are part of ST. Then, the empirical evidence concerning the theoretical model of ST will be presented together with findings about the effectiveness and implementation possibilities of ST. Finally, conclusions in terms of effectiveness and implementation possibilities will be drawn, and recommendations for future research will be presented.

## 2. Method

The description of the elements and techniques of ST, with focus on BPD, was based on extant and well-known therapy manuals and papers written on the subject. To provide empirical evidence on the theoretical model and the effectiveness of ST for BPD, we performed a comprehensive review of the literature. We used the search engines PsycInfo, Science Direct, PubMed, Web of Science, Eric, SpringerLink and the Cochrane Library to find relevant papers. The search language was English and papers from 1990, the period in which ST originated, until July 2012, were included. We excluded all types of publications other than scholar journals. The general search terms were: (borderline OR personality disorder) AND (schema OR Young's model OR mode). These terms were sought in the title, abstract and keywords of the papers. The search strategy was sometimes slightly adjusted to meet specific criteria of the search machines (e.g., filtering categories and journal topics).

Papers containing empirical information about Young's schema model and relations to BPD were included. Study reports explaining (parts of) the schema model with regard to personality disorders in general were only included when they reported specific information about BPD. Given the large amount of studies found on the relation between childhood traumatic experiences (including maltreatment) and BPD, we did not include all existent studies, but summarized the most important findings regarding BPD. Nevertheless, all papers examining the relationship of childhood traumatic experiences with (the development of) schemas were included. All the studies which clearly and exclusively evaluated the effectiveness of ST for the treatment of BPD were included. We excluded papers on methodological or statistical discussions of assessment instruments of the schema model, as well as papers that discussed the results according to other theoretical perspective (e.g., psychodynamic, evolutionary) than the schematic model.

The results obtained through the database search, together with additional papers in preparation or in press provided by the third author or obtained through contact with prominent authors in the field, were downloaded to the reference management software program Endnote. The first author excluded all the duplicate papers and papers that did not meet the criteria of English language, type and date of publication. Following electronic title screening, the first author also excluded clearly irrelevant papers (e.g., medical and biological papers, papers on other disorders than BPD, not discussing schemas) retaining only for further selection the papers that approached BPD or schemas in a specific or general fashion. The abstracts of the remaining papers were manually analyzed on eligibility by the first and fourth authors according to their relatedness to the main subject, schema therapy (model) and BPD. The contents of the remaining records were fully reviewed by the first and fourth author. Discrepancies were solved by discussion with the second author, leading to an acceptance of 36 papers (see Table 1). A flowchart of the selection process can be seen in Fig. 1.

## 3. Results

### 3.1. Development of schema therapy: Differentiating from pure cognitive therapy

ST has been developed as an extension of Beck's cognitive therapy to enable the treatment of more pervasive, enduring psychological

disorders in which cognitive therapy was less successful (McGinn & Young, 1996; Young, 1994). These characterological problems (as Young named them in 1994) differed importantly from the standard depressions on which Beck's model of cognitive therapy was based (McGinn & Young, 1996). First, Young noticed that the patients' complaints were often vague, and triggered in many different situations (McGinn & Young, 1996). Second, the patients remained distant in the therapeutic relation or, on the contrary, became too dependent on the therapist (McGinn & Young, 1996). Third, these people held more rigid belief systems than those seen in other psychiatric groups. Their patterns of thinking and feeling were deeply rooted in their cognitive structures and were pervasively expressed in maladaptive coping strategies (Young et al., 2003). Finally, these patients showed affective and cognitive avoidance that the techniques of cognitive therapy were not able to overrule (McGinn & Young, 1996).

Young (1994; Young et al., 2003) thought that to successfully treat BPD, enrichment of cognitive therapy with insights and techniques from object relation and attachment theories, and from Gestalt and emotion-focused therapies was necessary. For instance, more attention was given to traumatic experiences in childhood, a very empathic, protective therapeutic relationship was developed, and experiential techniques were integrated in the model. Coverage of these new aspects would require a 1–4 years-lasting therapeutic contact (Kellog & Young, 2006).

### 3.2. Early maladaptive schemas

ST and cognitive therapy share as most basic target of treatment the cognitive structure called maladaptive schema (Ball, 1998). A maladaptive schema is defined as a negative perception of oneself, others, and the environment, which is pervasive and gives meaning to each experience (Beck, Freeman, & Associates, 1990; Young, 1994). Cognitions, emotions, memories and body sensations all are integrated in maladaptive schemas, but not behavior, which is a reaction to the schema (Young et al., 2003). Maladaptive (and also adaptive) schemas are acquired early during childhood or adolescence, and reinforced during adulthood (Ball, 1998; Nordahl, Holthe, & Haugum, 2005). They are referred to as Early Maladaptive Schemas (EMSs) in ST. Genetic, biological and environmental factors are all of great influence in the development of EMSs (Nordahl et al., 2005); however, Young proposed that early abusive experiences or unmet needs could strongly contribute to the development of BPD (Kellog & Young, 2006). Young (1990) distinguished five tasks related to a healthy development, being connectedness, autonomy, worthiness, reasonable expectations, and realistic limits. Unfulfillment of these tasks due to a rough environment leads EMSs to arise (Young, 1990). Reflecting these necessities, Young classified 18 EMSs into five domains: disconnection and rejection, impaired autonomy and performance, undesirability, restricted self-expression, and impaired limits (Schmidt, Joiner, Young, & Telch, 1995; Young et al., 2003, see Table 2 for a more detailed description of the EMSs and the domains).

EMSs are the trait concepts of ST. They are assumed to be stable and resistant to change, have a self-confirmatory and self-perpetuating character, and act as filters of the incoming information. As only the schema-concordant information is processed, the meaning given to the incoming information also fits the schema (Arntz, 1994), and usually lead the person to act in schema confirmatory ways (Butler, Brown, Beck, & Grisham, 2002). EMSs are automatically activated by internal or external triggers for which patients are vulnerable depending on the specific schema content. Young (1999, 2003) has linked the EMSs related to distrust, emotional deprivation, and abandonment to BPD psychopathology, as well as schemas related to insufficient self-control/discipline and subjugation. Activation of these EMSs could lead directly or indirectly to psychological distress, which is noticeable in symptoms like depression, anxiety or aggression (Nordahl et al., 2005). To achieve longstanding symptom and distress relieve, EMSs need to be changed (Young et al., 2003). Among others, imagery

**Table 1**  
Summary of included studies.

Study name	Type of study and design	Participants	Studied aspects of Young's theory for BPD	Instruments*	Findings relevant for current purpose
Empirical evidence for ST model					
Arntz et al. (1999)	Validation and cross-sectional study	43 (100% women) - 16 BPD - 12 cluster C PD - 15 non-patients	- Specificity and stability of BPD assumptions Early origin of BPD psychopathology	Personality Disorder Beliefs Questionnaire (PDBQ) DSM-III-R SCID-I DSM-III-R SCID-II Childhood Trauma Questionnaire (CTQ)	- Ratings of BPD patients were higher on theorized BPD assumptions and remained relatively stable after one week. - BPD patients reported more experiences of physical, emotional, sexual abuse and physical neglect than control groups. The effect of (physical, emotional and sexual) abuse on BPD psychopathology was mediated by BPD assumptions. Physical neglect had a direct effect.
Arntz et al. (2004)	Cross-sectional study	643 (68% women), of which 373 completed assessment  - 47 BPD outpatients - 311 Avoidant, dependent, obsessive-compulsive, paranoid histrionic PDs 15 non-patients	- Specificity of BPD assumptions	Personality Disorder Beliefs Questionnaire (PDBQ) DSM-III-R SCID-I DSM-III-R SCID-II	- Scale items measuring assumptions of loneliness, unlovability, rejection, abandonment and maliciousness highly predicted BPD.
Arntz et al. (2005)	Cross-sectional study	54 (100% women)  - 18 BPD - 18 cluster C PD - 18 non-patients	- Specificity of BPD schema modes Mechanism of schema mode shifting pattern	DSM-IV SCID-I DSM-IV SCID-II Schema Mode Questionnaire developed for study	- BPD patients scored higher than both control groups on the maladaptive BPD schema modes, but as high as cluster C PD controls on the Compliant Surrender mode. - BPD patients scored lowest on the Healthy Adult schema mode. - Distress induction activated more strongly the schema mode Detached Protector in BPD patients than controls. The shifting pattern was mild and moderate.
Arntz et al. (2011)	Cross-sectional study	122 (59% women)  - 17 BPD (16 women) - 30 avoidant/ dependent PD - 29 obsessive-compulsive PD - 26 Axis-I patients 41 non-patients	- Biased evaluation of environmental stimuli	DSM-IV SCID-I DSM-IV SCID-II Personality Disorder Beliefs Questionnaire (PDBQ) Interpretation Task (IT)	- BPD patients showed specific BPD related interpretations of imagined situations. - Interpretation thoughts, feelings and behaviors were low flexible, highly criticizing and malevolency-expecting.
Barnow et al. (2009)	Cross-sectional study	115 (66.9% women)  - 51 BPD (of which 32 completed questionnaires) - 23 depression - 41 non-patients	- Biased evaluation of environmental stimuli	DSM-IV SCID-II Interpersonal Behavior Questionnaire (IIP-C) Symptom Checklist (SCL-90)	- Interpersonal evaluations of BPD patients were negatively biased in comparison with depressive patients and controls. People were specially seen as more aggressive and threatening.
Butler et al. (2002)	Cross-validation observational study	288 (61.8 women)  - 84 BPD outpatient (60 women) - 204 PDs outpatient Randomly split in two samples	- Specificity of BPD assumptions	Personality Disorder Beliefs Questionnaire (PDBQ)	- BPD patients scored higher than controls on BPD assumptions, but also on some other PD assumptions. - Fourteen strong BPD discriminative items formed a separate scale that was confirmed by cross-validation.
Carr and Francis (2009)	Cross-sectional study	178 non-clinical participants (66.3% women)	- Relationship between EMSs, childhood experiences and BPD psychopathology	Personality Diagnostic Questionnaire (PDQ4+) Parental Bonding Instrument (PBI) Family Functioning Scale (FFS) Childhood Trauma Questionnaire (CTQ) Personality Beliefs Questionnaire-borderline subscale (PBQ-B) Personality Disorder Beliefs Questionnaire-Borderline Subscale (PDBQQ)	- BPD symptoms and childhood traumatic experiences were positively correlated. - Partial correlations and mediation analysis showed that EMSs mediated the relationship between report of childhood emotional abuse and BPD symptoms.

Table 1 (continued)

Study name	Type of study and design	Participants	Studied aspects of Young's theory for BPD	Instruments*	Findings relevant for current purpose
Carr and Francis (2010)	Cross-sectional study	178 university students (66.3% women)	-Relationship between EMSs and BPD symptoms	Young Schema Questionnaire Beck Depression Inventory (BDI-II) Beck Anxiety Inventory (BAI) Personality Diagnostic Questionnaire (PDQ4+)	- After controlling for gender and comorbid Axis I disorders, EMSs did not significantly contribute to the explanation of BPD symptoms. None of the 15 EMSs were significant predictors.
Johnston et al. (2009)	Cross-sectional study	30 BPD patients (90% women)	Mechanism of schema mode shifting pattern	Wessex Dissociation Scale (WDS) Childhood Trauma Questionnaire (CTQ) General Health Questionnaire (GHQ) Schema Mode Questionnaire (SMQ)	- Scores on schema modes had a predictive and additive value on dissociation. - The Angry/Impulsive, Abandoned/Abused Child accounted greatly for the dissociation score.
Jovev and Jackson (2004)	Cross-sectional study	48 (54.2% women)  - 13 BPD - 22 avoidant PD - 13 obsessive-compulsive PD	- Specificity of BPD schemas and schema domains	DSM-IV SCID-I DSM-IV SCID-II Center for Epidemiological Studies Depression (CES-D) The State-Trait Anxiety Inventory (STAI) Schema Questionnaire short form (SQ-SF)	- The SQ identified specific patterns of schemas for the three tested PDs. - The schemas abandonment, dependence/incompetence and defectiveness/shame discriminated best BPD from other included PDs.
Kremers et al. (2007)	Prospective study, with assessments before (T1) and after 27 months of therapy (T2)	50 BPD outpatients (average age 31.1; 90% women) receiving either SFT or TFT	- Reported childhood traumas	DSM-IV SCID-I DSM-IV SCID-II Trauma Interview Dissociative Experiences Scale (DES) White Bear Suppression Inventory (WBSI) Beck Depression Inventory (BDI) Borderline Personality Disorder Severity Index (BPDSI) Impact of Event Scale (IES)	- High stability of total number of reported sexual, physical and emotional events - At T2 majority no longer reported > 1 of 33 listed events after psychotherapy - At T2 majority reported > 1 event not mentioned before treatment start. - These findings were not related to treatment type or changes in dissociative, depressive and borderline symptoms
Lawrence et al. (2010)	Cross-sectional study	58 (aged 15–24, 79.3% women)  - 30 BPD outpatients (27 women) - 28 non-clinical controls (19 women)	- Specificity of BPD schemas early in life - Relationship between EMSs and BPD diagnostic criteria	DSM-IV SCID-I BPD Module of DSM-IV SCID-II APD Module of the Diagnostic Interview for Personality Disorders (DIPD-IV) Young Schema Questionnaire-Short Form (YSQ-S2)	- BPD patients scored higher than controls on 11/15 EMSs, especially in the disconnection/rejection domain (mistrust/abuse and abandonment). - The associations between EMS and diagnostic criteria were not strong in the early phase.
Limberg et al. (2011)	Cross-sectional study	72 (58.3% women)  - 40 (37 women) BPD  - 32 (5 women) healthy controls	- Biased evaluation of environmental stimuli	DSM-IV SCID-I DSM-IV SCID-II Clinician-Administered PTSD Scale (CAPS) Reflex eye blink Heart rate Skin conductance	- Physiological reactivity of BPD patients was disorder-specific (abandonment and rejection). - Self-report showed general negative affect (not only disorder-specific). - Reactivity in BPD patients decreased when there was comorbidity with PTSD.
Lobbestael and Arntz (2010) <sup>a</sup>	Cross-sectional study	148 (58.5% women)  - 45 BPD (12 women) - 46 cluster C PD - 21 antisocial PD - 36 non-patients	- Mechanism of schema mode shifting pattern	DSM-IV SCID-I DSM-IV SCID-II Interview for Traumatic Events in Childhood (ITEC) Profile of Mood States (POMS) Heart rate Blood pressure (systolic and diastolic) Galvanic skin response Single Category Implicit Association Task-adapted version to self and abuse (SC-IAT)	- Increased reactivity to abuse and neglect in BPD patients than controls might be related to the shifting pattern. - The adaptive modes did not significantly decrease in BPD patients compared with controls. - Severity of childhood trauma was positively correlated with changes of maladaptive modes, negative affect and systolic blood pressure.

Lobbestael and Arntz (2012) <sup>a</sup>	Cross-sectional study	147 (58.5% women) - 45 BPD (12 women) - 46 cluster C PD - 21 antisocial PD - 35 non-patients	- Specificity BPD schema modes Mechanism of schema mode shifting pattern	DSM-IV SCID-I DSM-IV SCID-II Abbreviated version of the Schema Mode Inventory (SMI) Stress-Induction Interview Supernormality Scale-Revised (SS-R)	- At baseline BPD patients scored higher than the sample mean on 12 schema modes, except Self-Aggrandizer and Bully and Attack modes. - Controlled for social desirability, anger induction led to stronger activation of the Angry Child and Detached-Self Soother scales in BPD patients than antisocial and non-patient controls (not cluster-C). - The adaptive modes did not significantly decrease in BPD patients compared with controls.
Lobbestael et al. (2005)	Cross-sectional study	48 (50% women) - 16 BPD - 16 antisocial PD - 16 non-patients	- Early origin of BPD psychopathology. Specificity of BPD schema modes	DSM-IV SCID-I DSM-IV SCID-II Schema Mode Questionnaire Interview for Traumatic Events	- Abuse (physical, emotional, sexual) was more frequently reported by BPD and APD patients than non-patients. - BPD patients scored higher than both control groups on the maladaptive BPD schema modes. BPD patients scored low on Healthy Adult mode.
Lobbestael et al. (2008)	Cross-sectional study	489 (60.93% women) - 127 Axis-I - 240 Axis-II (22.3% BPD) - 23 not otherwise specified 99 healthy controls	- Relationship between schema modes and BPD psychopathology - Specificity of BPD schema modes	DSM-IV SCID-I DSM-IV SCID-II Schema Mode Inventory (SMI)	- There were unique combinations of schema modes for PDs. - BPD correlated positively with ten of 14 schema modes (strongest correlations with Vulnerable, Impulsive Child, Punitive Parent). BPD correlated negatively with the two healthy modes.
Lobbestael et al. (2009) <sup>a</sup>	Cross-sectional study	147 (58.5% women) - 45 BPD (12 women) - 46 cluster C PD - 21 antisocial PD - 35 non-patients	- Mechanism of schema mode shifting pattern	DSM-IV SCID-I DSM-IV SCID-II Stress-induction Interview Profile of Mood States Short Version (POMS) Abbreviated version of the Schema Mode Inventory (SMI) Heart rate Blood pressure (systolic and diastolic) Galvanic skin response Single Category Implicit Association Task-adapted version (SC-IAT) Young Schema Questionnaire	- Anger induction led to significant increase of the schema modes Angry and Enraged Child in BPD patients compared with antisocial PD and non-patients.
Nilsson et al. (2010)	Cross-sectional study	85 (100% women) - 31 BPD - 25 bipolar patients - 29 student controls	- Specificity of BPD schemas	Young Schema Questionnaire	- BPD patients scored higher than controls and bipolar patients on all EMS scales except failure to achieve, enmeshment, and entitlement.
Reeves and Taylor (2007)	Cross-sectional study	804 university students (49.6% women)	- Relationship between EMSs and BPD symptoms	Young Schema Questionnaire DSM-IV SCID-II-Q Personality Diagnostic Questionnaire (PDQ-IV)	- After controlling for gender and symptoms of other PDs, EMSs abandonment and social isolation were positive predictors; enmeshment was a negative predictor of BPD symptoms.
Sieswerda, Arntz, and Kindt (2007)	Cross-sectional study	65 patients (75-94% women in 3 ages subgroups) - 16 BPD - 18 Cluster CPD - 16 Axis I disorder - 16 normal controls	- Biased evaluation of environmental stimuli	DSM-IV SCID-I DSM-IV SCID-II State-Trait Anxiety Inventory (STAI) Personality Disorder Beliefs Questionnaire (PDBQ-120) Structured Childhood Trauma Interview (VBC) Reaction Time (RT) to computerized emotional Stroop Task	- BPD patients were hypervigilant to emotional cues; so were Axis I patients. - Their hypervigilance concerned negative (but here only schema-related) as well as positive cues.
Specht et al. (2009)	Cross-sectional study	105 BPD patients (100% incarcerated women)	- Specificity of BPD schema domains Early origin of EMSs	BPD and antisocial module of the DSM-IV SCID-II Young Schema Questionnaire- Short Form (YSQ-S2) Childhood Trauma Questionnaire (CTQ)	- The domain Impaired Limits and Disconnection/ Rejection were predictors of BPD severity (after control for depression and APD, respectively). The domains Impaired Limits, Disconnection/Rejection mediated between childhood maltreatment (not sexual abuse) and severity of BPD psychopathology.

(continued on next page)

Table 1 (continued)

Study name	Type of study and design	Participants	Studied aspects of Young's theory for BPD	Instruments*	Findings relevant for current purpose
Effectiveness of ST Farrell et al. (2009)	RCT, with assessments at baseline, post-treatment and 6-month follow-up	28 BPD patients (100% women) - 16 ST + TAU - 12 TAU	- Effectiveness of ST + TAU vs. TAU alone (eclectic therapy).	Diagnostic Interview for Borderline Personality Disorders-Revised (DIB-R) Borderline Syndrome Index (BSI) Symptom Check List-90 (SCL-90) Global Assessment of Function Scale (GAFS)	- The combination ST + TAU showed 100% retention rate vs. 75% for TAU alone. - Patients of the ST + TAU group showed clinical significant improvement on all measures. The change in TAU patients was not significant. - At post-treatment, 94% of the ST + TAU group vs. 16% of TAU showed remission of symptoms.
Giesen-Bloo et al. (2006) <sup>b</sup>	RCT, with assessments at baseline before randomization and every 3 months for 3 years	88 BPD patients (93% women) - 45 ST - 43 TFP	- Effectiveness of twice-weekly ST vs. TFP	Borderline Personality Disorder Severity Index (BPDSI-IV) EuroQol Thermometer World Health Organization Quality of Life Assessment (WHOQOL) Symptom Checklist-90 (SCL-90) Rosenberg Self-Esteem Scale Miskimins Self-Goal (-Other) Discrepancy Scale Young Schema Questionnaire (YSQ) Personality Disorder Beliefs Questionnaire-BPD Section (PDBQ-Q) Inventory of Personality Organization-Borderline Defense Style Questionnaire (DSQ) Beck Depression Inventory (BDI) Schema Questionnaire Agoraphobic Cognitions Questionnaire Social Cognition Questionnaire	- Both ST and TFP were effective in reducing general and specific psychopathology and increasing quality of life. - The effectiveness of ST was larger on the subscales measuring impulsivity, identity disturbance, para-suicidal behavior, fear of abandonment, quality of relationships, dissociation and paranoid ideation. - Drop-out was lower among ST.
Morrison (2000)	Single case, with mid-, end and follow-up evaluation over 3.5 years.	1 woman with BPD symptoms (as stated by author)	- Effectiveness of cognitive therapy with ST	Beck Depression Inventory (BDI) Schema Questionnaire Agoraphobic Cognitions Questionnaire Social Cognition Questionnaire	- Scores on EMSs seemed to drop markedly on each evaluation. - Depression and anxiety scores were low at the end of treatment.
Nadort et al. (2009a)	RCT, with assessments every 3 months for 1.5 years	62 BPD patients (gender not mentioned) 31 therapists (each treating 2 patients; 71% women)  - 16 ST + crisis-support - 15 ST as in protocol	- Implementation of SFT - Effectivity of ST + crisis-support vs. ST alone	BPD module of DSM-IV SCID-II Borderline Personality Disorder Severity Index (BPDSI-IV) Symptom Checklist-90 (SCL-90) EuroQol Thermometer/ World Health Organization Quality of Life Assessment (WHOQOL) Symptom Checklist 47 (BPD-47) Symptom Checklist-90 (SCL-90) Young Schema Questionnaire (YSQ) ST Therapy Adherence and Competence Scale for BPD	- Both ST groups (with and without crisis support) showed significant reduction of general and specific psychopathology and of EMSs scores. Quality of life increased. - Extra crisis support did not have a medium or large effect on treatment. - ST with protocol modifications (shorter treatment, less sessions in the second year, DVD-based training) to facilitate implementation is a viable option.
Nadort et al. (2009b)	2 qualitative surveys (2004, 2008) Training program with A-B design	29 mental health institutes 72 respondents gender not mentioned)  - 49 therapists - 23 managers 8 therapists (92% women)	- Implementation of ST - Evaluation of ST training with DVD's	Questions about promoting and hindering factors for the implementation of ST Therapy adherence in filmed sessions	- Most institutions were not satisfied with current BPD treatment. - Availability of scientific evidence, media attention and support of the institution and BPD organizations would promote implementability. - Barriers to implementation are financial difficulties; travel distance to place of supervision and the necessity of provide crisis-support. - DVD-supported ST training for therapists was evaluated as a good and easier to implement option for teaching ST techniques.

Nordahl and Nysaeter (2005)	Single case series with A–B design, with assessments at pre-treatment, 20th, 40th, post-treatment and 12-month follow-up	6 patients with BPD and other Axis-I and Axis-II disorders (100% women)	- Effectiveness of ST with emphasis on schema work and limited re-parenting	DSM-IV SCID-I DSM-IV SCID-II DSM-IV General Adaptive Functioning Scale (GAF) Beck Depression Inventory (BDI) Beck Anxiety Inventory (BAI) Young Schema Questionnaire (YSQ) SCL-90-R Global Severity Index (GSI) Inventory of Interpersonal Problems (IIP)	- 5 patients showed clinical meaningful improvement on all measures, including self-injuring behavior.  - 3 patients recovered by the end of the treatment. 1 patient re-lapsed at follow-up. - GAF score showed a relatively large improvement at post-treatment.
Sieswerda, Arntz, Mertens, and Vertommen (2007) <sup>b</sup>	Between-within study within RCT	88 (93% women)  - 24 BPD (21 women) - 16 BPD patients receiving ST (13 women) - 23 non-patients	- Biased evaluation of environmental stimuli - Effectiveness of ST to reduce hypervigilance	DSM-IV SCID-I DSM-IV SCID-II Symptom Checklist 47 (BPD-47)/Borderline Personality Disorder Severity Index (BPDSI-IV) State-Trait Anxiety Inventory (STAI) Emotional Stroop Interference (ESI) Task Awareness Task.	- BPD patients scored higher than controls on general, as well as disorder-specific emotional reactivity. - BPD patients who recovered after ST, also showed less emotional reactivity than non-recovered patients.
Spinhoven et al. (2007) <sup>b</sup>	RCT, with assessments at 3, 15 and 33 months	78 BPD patients (93% women)  - 45 ST - 43 TFP	Importance of therapeutic alliance in ST vs. TFP	Borderline Personality Disorder Severity Index (BPDSI-IV) BPD module of DSM-IV SCID-II TFP Rating of Adherence and Competence Scale SFT Therapy Adherence and Competence Scale for BPD Working Alliance Inventory (WAI) Difficult Doctor–Patient Relationship Questionnaire–Ten Item Version (DDPRQ-10) Young Schema Questionnaire (YSQ) Inventory of Personality Organization (IPO)	- Compared with TFP, the quality of therapeutic alliance as reported by the therapists was higher in the ST condition. - Low quality of therapeutic alliance was predictive of dropout, whereas high quality of therapeutic alliance during the first 6 months predicted clinical improvement. There was a group effect; quality of therapeutic alliance seemed intrinsically related to ST vs. TFP.
Spinhoven et al. (2008) <sup>b</sup>	RCT, with assessments every 3 months for 3 years	28 therapists (46.4% women)  - 24 clinical psychologists - 4 psychiatrists - 71 BPD patients (93% women) - 36 ST - 35 TFP	- Relationship between therapists' prognostic assessment and patient characteristics and treatment outcome	Borderline Personality Disorder Severity Index (BPDSI-IV) Symptom Checklist-90 (SCL-90) DSM-IV SCID-I/P and SCID-I/SCID-II Probability of Treatment Success (PTS) Treatment Credibility Scale (TCS)	- Prognostic assessments did not relate to patient characteristics. - Therapists rated the probability of success higher for ST than for TFP. - Patients rated as less likely to be successful had a higher chance on dropout. - Prognostic assessments predicted BPD severity after controlling for patient characteristics. - Prognostic assessments predicted which BPD patients failed to change reliably or had not recovered after 3 years of therapy in TFP only.
Van Asselt et al. (2008) <sup>b</sup>	Economical analysis within RCT	88 BPD patients (93% women)  - 45 ST - 43 TFP	- Cost-effectiveness of ST	Structured Cost Interview Standardised Dutch unit prices Borderline Personality Disorder Severity Index (BPDSI-IV) Health-related Quality of Life (EQ-5D) Cost-Effectiveness Ratios (ICERs)	- The probability of ST to be societal more cost-efficient than TFP is moderate to high. - ST's recovery rate and societal costs over 4 years were not significantly different than TFP's

Note. Not yet published studies (Dickhaut & Arntz, in preparation; Reiß et al., 2013; Rijkeboer et al., in preparation) and the studies on BPD and childhood traumatic experiences have not been included in this table.

\* Only relevant instruments for the current purpose.

<sup>a, b</sup> Conclusions were based on the same sample.

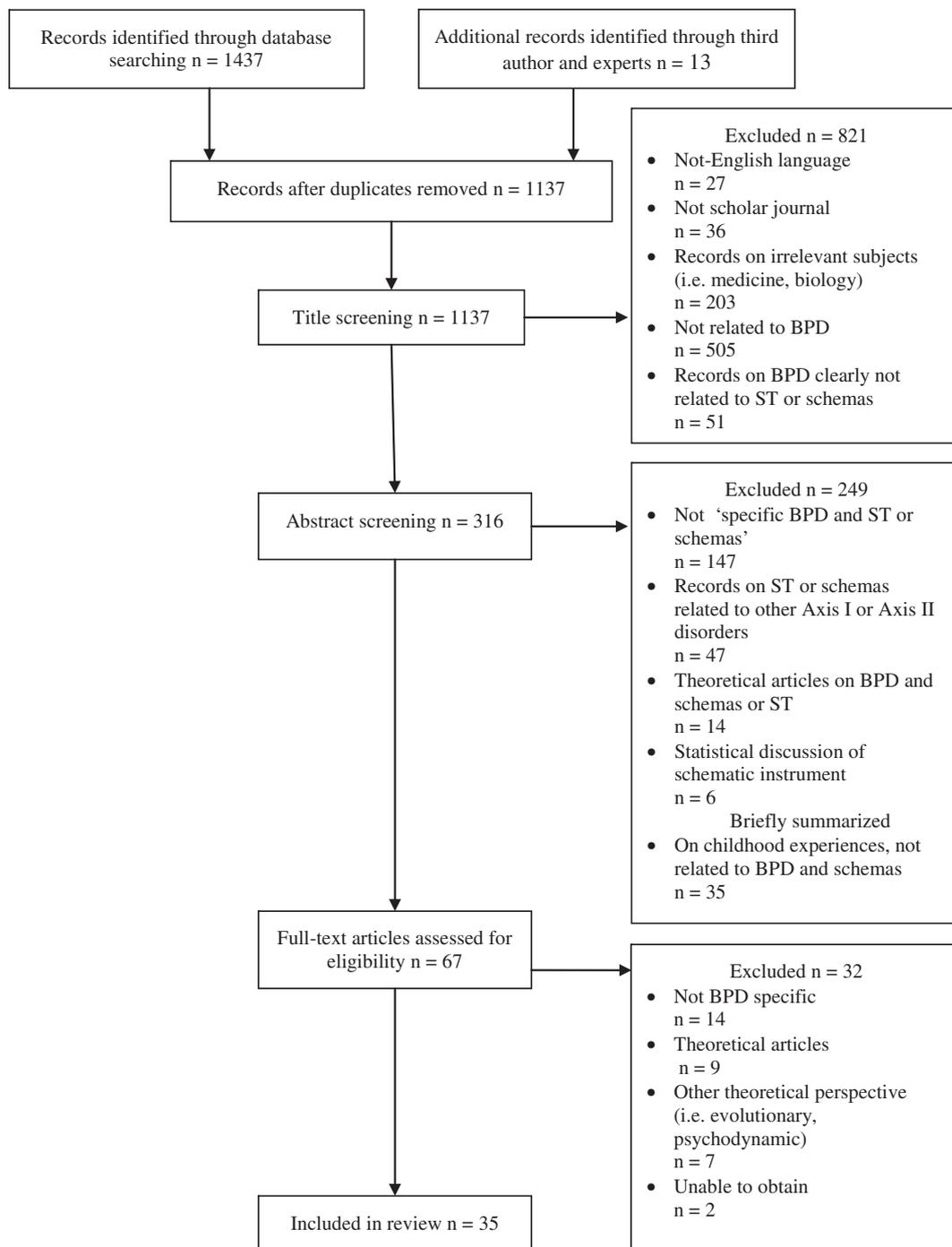


Fig. 1. Flow chart of the selection process.

techniques, aimed to reprocess the images and meaning of the early experiences that most likely gave place to the EMSs, are used during ST with this purpose (Arntz, 2011; Young, Klosko, & Weishaar, 2003). Young (1994) conceptualized three styles of coping with the distress caused by the EMSs: overcompensation, avoidance and surrender. Overcompensation occurs when a patient fights his schemas and fakes a different reality. Avoidance refers to the serious efforts done to avoid the triggers that activate a schema. Patients surrender to their schemas when they allow them to rule their lives (Lobbestael, van Vreeswijk, & Arntz, 2007; Young, 1994). Each strategy can take many forms, as many different coping reactions (actual behavior)

might be displayed to achieve short-term relief, maintaining in the long run the psychopathology.

Assumptions in the form of verbal representations of the negative beliefs or as reconstruction of the tacit knowledge that is assumed to be at the core of the schema underlie EMSs. According to Beck et al. (1990), assumptions presented by borderline patients cover three basic themes: dependency and vulnerability, distrust of others and inner badness. Based on their clinical experience with BPD, Young and other researchers (Arntz, Dietzel, & Dreessen, 1999; Schmidt et al., 1995; Young, 1990) have proposed a larger variety of assumptions including loneliness, emptiness, unlovability, fear of losing emotional

**Table 2**  
Summary of elements within Schema theory.

Schema domains <sup>a</sup>	Early maladaptive schemas <sup>a</sup>	Assumptions <sup>b</sup> (verbal representations at core of EMSs – BPD only)	Schema modes <sup>a</sup> (most relevant for BPD)	Coping styles <sup>a</sup>
<p><b>Disconnection &amp; Rejection</b> Lack of confidence that individual needs of safety, empathy, nurturance, acceptance and respect will be met consequently by surrounding others, who typically are cold, rejecting, abusive and unpredictable</p>	<p><b>Abandonment/Instability</b> Significant others are perceived as unstable or unpredictable, hence not available for support or protection</p> <p><b>Mistrust/Abuse</b> The belief that others will intend to physically or emotionally harm you or do this by negligence</p> <p><b>Emotional deprivation</b> Expectation that significant others will not protect, show empathy or be nurturing when needed</p> <p><b>Defectiveness/Shame</b> Perception of one-self being inherently bad and unlovable, for which there is hypersensitivity, self-consciousness or shame.</p> <p><b>Social Isolation/Alienation</b> Belief that one is different from everybody else and does not belong to any group.</p>	<p><i>Distrust of others</i> 'Other people are evil and abuse you'. 'If I trust someone, I run a great risk of getting hurt or disappointed'. <i>Emotional deprivation</i> 'There is no one who really cares about me, who will be available to help me, and whom I can fall back on'. <i>Inner badness</i> 'If other people really get to know me they will find me rejectable'. <i>Unlovability</i> 'If others really get to know me, they will find me rejectable and will not be able to love me; and they will leave me'. <i>Loneliness</i> 'I will always be alone'. <i>Dependency</i> 'I can't manage it by myself, I need someone I can fall back on'. <i>Fear of losing emotional control</i> 'I need to have complete control of my feelings otherwise things go completely wrong'. <i>Vulnerability</i> 'I'm powerless and vulnerable and I can't protect myself'. 'I will never get what I want.'</p>	<p><b>Child Modes</b> <i>Vulnerable Child– Abandoned and Abused child</i> Core state of BPD where pain and fear related to unmet needs and abuse in the past are activated. <i>Angry and Impulsive child</i> State of intense anger and frustration for the unmet needs, which is expressed in an uncontrolled manner. <b>Maladaptive Coping Modes</b> <i>Detached Protector</i> State of emotional disconnection and isolation through depersonalization or self-soothing activities. <b>Maladaptive Parent Modes</b> <i>Punitive Parent</i> State that usually reinforces the internalized rules by being punishing or abusive towards the self or others. <b>Adult Modes</b> <i>Healthy Adult</i> Adaptive mode involved in normal functioning as adult, weakly present in BPD. It validates, nurtures and sets limits for the child modes and neutralizes the coping and parent modes.</p>	<p><b>Surrender</b> Allowing the schemas to overrule all or almost all aspects of life.</p> <p><b>Avoidance</b> Blocking out and escaping the schemas and schema-triggering stimuli.</p> <p><b>Overcompensation</b> Making great effort of not giving in to the schema and acting differently than how the person really feels to.</p>
<p><b>Impaired Autonomy and Performance</b> Beliefs that contribute to a poor perception of the self as independent, competent and able to separate from the family of origin, which is typically enmeshed, overprotective, undermining or does not stimulate competent functioning outside the family</p>	<p><b>Dependence Incompetence</b> Feeling that one is unable to function in daily life without considerable help from others</p> <p><b>Vulnerability to harm or illness</b> Extreme fear for an unavoidable (medical, emotional or external) catastrophe to happen at any time.</p> <p><b>Enmeshment/Undeveloped self</b> Belief of inability to survive without a significant other, due to emotional overinvolvement and insufficient individuation.</p> <p><b>Failure</b> Belief of fundamental inadequacy that will lead to inevitable failure.</p>	<p><i>Conviction of being superior to others, deserving special treatment and not bound by common rules.</i> <b>Insufficient self-control/self-discipline</b> Pervasive lack of self-control and excessive discomfort-avoidance at the expense of self-fulfillment.</p> <p><b>Subjugation</b> Excessive compliance to others' influence to avoid anger, retaliation or abandonment.</p> <p><b>Self-sacrifice</b> Maladaptive will of always meeting others' needs, at the expense of own desires, to avoid guilt or beware the relationship.</p> <p><b>Approval-seeking/Recognition-seeking</b> Pervasive seeking of approval, attention and social acceptance, above a secure sense of self.</p> <p><b>Negativity/Pessimism</b> Pervasive expectation and fear of failure. Excessive focus on the negative aspects of life.</p> <p><b>Emotional Inhibition</b> Lifelong suppression of emotions, impulses and needs to avoid disapproval.</p>	<p><i>'If you comply with someone's request, you run the risk of losing yourself.</i> <i>Inadequate self-discipline</i> 'I have no control of myself'. 'I can't discipline myself'. <i>Subjugation</i> 'I have to adapt my needs to other people's wishes; otherwise they will leave me or attack me'. <i>Emptiness</i> 'I don't really know what I want'. <i>Guilt</i> 'If you refuse someone's request, you run the risk of losing that person'. <i>'Other people are not willing or helpful'. 'My feelings and opinions are unfounded'. 'If someone fails to keep a promise, that person can no longer be trusted'.</i></p>	
<p><b>Impaired Limits</b> Incapacity of setting limits and goals for one's behavior or to respect others' rights and wishes and cooperate with them. Family of origin is usually permissive, overindulgent and does not provide supervision nor guidance</p>				
<p><b>Other-directedness</b> Maladaptive focus on others' desires and demands above attention for own needs, usually by suppressing and ignoring own tendencies in order to gain approval. Family of origin usually put conditions for receiving acceptance and love.</p>				
<p><b>Overvigilance and Inhibition</b> Extreme self-inhibition and self-vigilance in order to meet strict internalized rules of behavior that demand perfection and high performance. Family of origin is usually demanding, critical and punitive.</p>				

(continued on next page)

**Table 2** (continued)

Schema domains <sup>a</sup>	Early maladaptive schemas <sup>a</sup>	Assumptions <sup>b</sup> (verbal representations at core of EMSs – BPD only)	Schema modes <sup>a</sup> (most relevant for BPD)	Coping styles <sup>a</sup>
	<p><b>Unrelenting standards/Hypercriticalness</b> Belief that one must perform and behave according to very rigid and high standards, to avoid criticism.</p> <p><b>Punitiveness</b> Belief that one and others must be punished when making mistakes or not meeting standards.</p>	'I am an evil person and I need to be punished for it'.		

<sup>a</sup> Adapted from Young, Klosko, & Weishaar, (2003).

<sup>b</sup> Assumptions as in the Personality Disorder Beliefs Questionnaire (PDBQ; Dreesen & Arntz, 1995).

control, subjugation, inadequate self-discipline, guilt, and emotional deprivation. Many assumptions underlying the EMSs in BPD are considered having a highly paradoxical character. Within the cognitive tradition, the paradoxical beliefs lead to the dramatic, emotional changes characteristic of BPD (Beck et al., 1990).

### 3.3. Schema modes

To further explain the swinging (also known as flipping) behavior of borderline patients, Young et al. (2003) introduced a model based on the idea that borderline patients, triggered by environmental stimuli, often regress into some intense emotional moment experienced as a child (Lobbestael et al., 2007). In such a moment, a schema mode, which is "an organized pattern of thinking, feeling and behaving based on a set of schemas, relatively independent from other schema modes" (Arntz, Klokman, & Sieswerda, 2005, p. 227), gets activated. Schema modes should be thus understood as the combination of an activated schema and a coping strategy with the related coping reactions. When an EMS is triggered, the coping strategy leads to activation of related vulnerable modes (Young et al., 2003). Because of the concept of schema mode, ST has also been named schema mode therapy. Schema mode therapy does not differ from ST, but rather refers to working with modes at a more advanced level, necessary for the treatment of more complex personality pathology, such as BPD (Bamber, 2004; Lobbestael et al., 2005).

Whereas healthy people also present schema modes, but rather in a mild, gradual and cohesive way, people with BPD can only present one schema mode at the time (Bamber, 2004; Young et al., 2003). Their schema modes represent different facets of their personality that have not been integrated into a whole. This gives rise to a functional dissociative self, which is reflected in the abrupt changes seen in BPD (Johnston, Dorahy, Courtney, Bayles, & O'Kane, 2009; Young et al., 2003). The more extreme the dissociative personality of a borderline individual is, the greater the degree of pathology and the more separated maladaptive schema modes are from each other and from healthy aspects of the personality (Johnston et al., 2009; Young et al., 2003).

In Young's theory, EMSs are combined to form 10 schema modes present in different ways in many personality disorders (Young et al., 2003). In the case of BPD, there are four predominant maladaptive schema modes: the Abandoned and Abused Child, the Angry and Impulsive Child, the Detached Protector and the Punitive Parent. For instance, when the Abandoned and Abused Child schema mode is activated, the memories and feelings related to past abuse or unmet needs are activated too (Arntz et al., 2005). This is a painful, but core state of individuals with BPD (Young et al., 2003), when they feel worthless, helpless (Johnston et al., 2009) and would desperately act to find someone who does not abandon them, yet at the same time they are too scared to approach others around them (Arntz et al., 2005). The Healthy Adult, an adaptive mode, is only weakly present in BPD.

Following the schema model, the experienced distress and psychopathology of BPD will diminish when the maladaptive schemas

or schema modes acquired during childhood or adolescence are replaced for more adaptive ones (Zanarini, 2009). The therapist makes use of cognitive and behavioral techniques as well as experiential and interpersonal techniques (Kellog & Young, 2006; McGinn & Young, 1996; Young et al., 2003). Moreover, the therapeutic relationship is used in ST as a powerful tool to test and change the maladaptive character of the schemas (McGinn & Young, 1996), and to meet, in a limited way, the needs of the patient.

### 3.4. Empirical research on the theoretical concepts

In the following section, the main theoretical elements of ST for BPD will be evaluated under the light of empirical studies that have been conducted in the field. These theoretical components are the core BPD assumptions and schema modes. The main results will be presented, as well as their limitations, which should allow us to form an image of the current status of ST.

#### 3.4.1. Origin of early maladaptive schemas and their relation to BPD

As mentioned before, Young's model theorizes a link between the unsatisfactory completion of developmental needs (connectedness, autonomy, worthiness, reasonable expectations, realistic limits) and the origin of maladaptive schemas that lead to pathology. It is not specified which negative experiences as child or adolescent could be involved in the process, though the experiences related to the primary caregivers are pictured as the most determinant during early childhood, whereas experiences with peers and the community become later more influential (Young et al., 2003).

Studies covering the relationship between childhood abuse and BPD have shown different forms of childhood maltreatment to be associated with BPD, such as serious neglect, emotional, physical or sexual abuse (Allen, 2008; Elzy, 2011; Lobbestael, Arntz, & Sieswerda, 2005; Sansone, Songer, & Miller, 2005). These studies find that BPD patients show much higher prevalence of all types of childhood abuse in comparison to other non-clinical and clinical (including other personality disorders) samples. Furthermore, a 10-year prospective study of Zanarini and colleagues (Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006) with 290 BPD inpatients (80.3% women) found that, among other variables such as no record of substance abuse in the family or low neuroticism, the absence of childhood sexual abuse predicted faster time of remission from BPD. Other types of negative early experiences, such as being bullied, have not been as extensively studied as child abuse, yet Sansone, Lam, and Wiederman (2010) found significant positive correlations between the self-report of being bullied in childhood and two self-report measures of BPD in adulthood. These findings illustrate how important history of (sexual) childhood abuse seems to be, not only to the origin, but also to the clinical course of BPD. Other negative experiences, like being bullied, seem also to be highly relevant to the origin of BPD.

Examining Young's model more explicitly on the associations between childhood experiences of abuse, EMSs and BPD symptoms,

Arntz et al. (1999) found that although women with BPD had more often been victims of sexual, physical, emotional abuse and neglect (87%) than control groups (cluster C personality disorders and normal controls), the effect of child abuse (particularly physical, emotional and sexual abuse) on BPD psychopathology was mediated by BPD assumptions. Physical neglect also contributed directly to the borderline symptoms, but the instrument, Personality Disorder Beliefs Questionnaire, used in this study did not include assumptions related to physical neglect. Specht, Chapman, and Cellucci (2009) found that the EMSs domains impaired limits and disconnection/rejection mediated the association between general childhood maltreatment (physical and emotional abuse, lack of emotional support) and BPD severity among incarcerated women. In this study, sexual abuse was not significantly related to BPD severity; maybe resulting from a ceiling effect (63% had a high score on child abuse). Carr and Francis (2009) replicated the findings of Arntz et al. (1999) with a non-clinical sample mainly consisting of college students testing the “cognitive mediation hypothesis”. Their cross-sectional results support a model in which the associations between (retrospectively reported) experiences with childhood maltreatment and a dysfunctional family environment on the one hand and BPD symptoms on the other are mediated by personality and personality disorder beliefs. These beliefs were measured with the borderline subscale of the Personality Belief Questionnaire (Butler et al., 2002) and the borderline subscale of the Personality Disorder Beliefs Questionnaire (Arntz et al., 1999), and conceived as indicators of dysfunctional core beliefs and assumptions typical for BPD patients. Interestingly, the authors found particularly childhood emotional abuse to uniquely predict borderline symptoms when controlling for all other forms of childhood maltreatment and family functioning factors.

Indirect evidence for the importance of cognitive mediation between childhood maltreatment and BPD comes from the study by Kremers, van Giezen, van der Does, van Dyck, and Spinhoven (2007). They assessed self-reported childhood traumas before and after 27 months of intensive treatment with SFT or TFP, and found high (almost, but not totally complete) consistency in the number and nature of reported events. The (non-)changes were unrelated to favorable changes in BPD and other symptoms. The report of number of childhood maltreatment experiences remained stable, even though BPD symptoms decreased after both types of therapy. On the other hand, the type of reported experiences did change. These changes did not seem related to the therapeutic work. BPD patients may have difficulties recalling details or have only a general impression in mind corresponding with a certain level of BPD severity. Their findings make us also reflect on the causative link between childhood trauma and BPD. EMSs might mediate this association and also be related to BPD symptom reduction, but the finding that EMS change coincides with recovery does not necessarily imply that EMSs also have a causative role.

Taken all together, childhood maltreatment seems to be highly present in BPD samples; in addition, many EMSs and assumptions seem to mediate the relationship between these experiences and BPD psychopathology. This supports Young's ideas that unmet needs in early life stages lead to the development of negative assumptions/schemas, which mediate and maintain BPD symptoms. Incongruence was found concerning the type of abuse related to BPD psychopathology. Emotional abuse was always associated with BPD symptoms, whereas sexual abuse was not always associated. This is surprising given the strong results of the prospective study of Zanarini et al. (2006), where sexual abuse was importantly related to BPD psychopathology, for which more research should be done linking this type of abuse to EMSs.

#### 3.4.2. Development and specificity of EMSs in BPD

Lawrence, Sabura, Allen, and Chanen (2010) studied if maladaptive schemas are already present in early stages of BPD. The EMSs of 30 young borderline outpatients (27 females), who met at least four of the BPD DSM-IV criteria (APA, 2000), were compared to those of 28 mentally healthy controls (19 females). Compared with controls,

the BPD group scored higher on 11 of the 15 EMSs tested (except enmeshment, self-sacrifice, entitlement and unrelenting standards) as well as on clinical measurement. The schemas within the disconnection/rejection domain (especially abandonment and mistrust/abuse) appeared to be prominent in the BPD group, but schemas of other domains were also significantly present. This study was unique in using a detailed BPD diagnostic profile that included a representation of threshold and subthreshold levels on the DSM-IV criteria and comorbid disorders. Lawrence et al. (2010) searched for particular association patterns between the EMSs and the distinct DSM diagnostic criteria for BPD. Some DSM criteria for BPD showed to be related to some of Young's EMSs (e.g., the criterion ‘intense and inappropriate anger’ was negatively related to the schema defectiveness/shame). Probably due to the small sample, the associations found were not strong enough to demonstrate a strong predictive capacity of the EMSs, concerning the different DSM criteria for BPD, which suggests that in the early phase, it is difficult to talk about schema specificity (Lawrence et al., 2010).

The extent to which BPD differs from bipolar disorder in terms of EMSs has been investigated by Nilsson, Jørgensen, Straarup, and Licht (2010). The EMSs of 31 borderline outpatients have been compared with 25 bipolar outpatients and 29 student controls (all females). The borderline patients had significantly higher scores on all of Young Schema Questionnaire subscales compared to the controls and the bipolar patients except for failure to achieve, enmeshment, and entitlement. Based on these results, Nilsson et al. (2010) suggest that EMSs are more severe in borderline patients than in bipolar patients, but this study does not show EMS specificity in BPD compared to bipolar disorder.

Jovev and Jackson (2004) evaluated the Schema Questionnaire to distinguish between adult individuals with BPD ( $n=13$ ), Avoidant personality disorder ( $n=22$ ) and Obsessive personality disorder ( $n=13$ ) based on their scores on 16 EMSs and the supposed specificity of schemas and schema domains. BPD subjects scored high on the schemas of abandonment, dependence/incompetence and defectiveness/shame, which is consistent with Young et al.'s theoretical work (2003). Lower scores on the schemas dependence/incompetence and vulnerability to harm differentiated BPD from obsessive-compulsive personality disorder. Avoidant personality disorder and BPD were both associated to schemas of abandonment and defectiveness/shame however, higher scores on the schemas enmeshment and unrelenting standards discriminated BPD, which might explain why BPD subjects have more identity and self-worth problems. Assets of this study are the structured interviews to establish the clinical diagnose and controlling for depression and anxiety state trait (not affecting results). Subjects with more than one of the mentioned personality disorders were also excluded, but individuals with other comorbid personality disorders, such as the dependent type, were not. This aspect, together with a small sample, hinders formulating conclusions about the schemas that are specific of BPD.

The cross-sectional relationship between EMSs and BPD symptoms has been examined by Reeves and Taylor (2007) in a nonclinical sample consisting of 804 college students (405 males and 399 females). After controlling for gender and symptoms of other personality disorders, EMSs, measured by the Young Schema Questionnaire, explained a significant proportion of 13% BPD symptom variance. Individual predictors were narcissistic and antisocial personality disorders, and the EMSs abandonment, social isolation and enmeshment. Contrary to expectations, enmeshment negatively predicted BPD symptoms. According to Reeves and Taylor (2007), students in this sample who were more involved with their parents might have received more parental support, which might have acted as a protective factor. Carr and Francis (2010) further examined the cross-sectional relationship between EMSs and BPD symptoms in a nonclinical sample consisting of 60 male and 118 female college students. They found that, after controlling for gender and comorbid depression, anxiety and eating disorders, Young's EMSs did not significantly contribute to the explanation of BPD symptoms, adding

14.4% explained variance. Unexpectedly, none of the 15 EMSs were significant predictors.

Specht et al. (2009) examined the relationship between Young Schema Questionnaire subscales to measure EMSs and severity of BPD symptoms in a sample of 105 incarcerated women. They found that particularly the schema domains disconnection/rejection, impaired autonomy, and impaired limits strongly correlated with the severity of BPD symptoms and predicted 41% of its variance. After controlling for depression, the domain impaired limits (symptoms like poor self-control, inconsistency achieving goals and feelings of grandiosity) remained a significant predictor (29%). When controlling for antisocial personality disorder, only the domain disconnection/rejection (symptoms like mistrust, fear of abuse and abandonment, lack of self-esteem) remained a significant predictor, explaining of 27% of the borderline severity variance. Controlling for comorbid disorders is an asset of this study indicating that in this sample depression and antisocial personality disorder explains a portion of the variance in borderline symptom severity (Specht et al., 2009). Unfortunately, the study lacked a control group, had a cross-sectional design, and a specific sample, making generalization of the results difficult for the complete BPD population.

The reviewed studies in this section show mixed results. On one side, some authors have found that there are EMSs that differentiate BPD patients from other groups and that explain BPD symptom variation; on the other side, there are also studies that did not find associations between EMSs and BPD symptoms or that found unexpectedly that some EMS negatively predicted to BPD. The differing results might be due to different populations included in the studies that presented dissimilar BPD severity (clinical vs. non-clinical students).

#### 3.4.3. Specificity of BPD assumptions

Arntz et al. (1999) tested whether the presumed BPD assumptions are indeed typical for BPD using six subscales of the Personality Disorder Beliefs Questionnaire. To take comorbidity effects of cluster A and B personality disorders into account, they compared ratings of 16 women with BPD, 12 women with cluster C personality pathology, and 15 healthy women. BPD patients scored significantly higher than cluster C patients (and these higher than controls) on the sets of assumptions characteristic of paranoid, histrionic and BPD. However, after controlling for histrionic and paranoid traits in both groups, only the difference in BPD assumptions remained significant, indicating that these assumptions properly reflect the characteristics of BPD. To test the stability of the assumptions, participants reported their assumptions again one week later, after being primed with an emotional video to induce negative mood and BPD schemas. The degree to which participants believed in any of the assumptions was not significantly different after watching the video, which stands for high BPD assumption stability. In a later study involving 643 subjects, 6 personality disorders (43 BPD patients) and the Personality Disorder Beliefs Questionnaire, Arntz, Dreesen, Schouten, and Weertman (2004) found further evidence for specific assumptions characterizing BPD. Assumptions regarding the themes of loneliness, unlovability, rejection and abandonment by others, and viewing the self as bad and deserving punishment were found highly BPD discriminative.

Butler et al. (2002) tested on a larger sample if BPD is only characterized by BPD assumptions or also by maladaptive beliefs characteristic of other personality disorders. Eighty-four BPD outpatients and 204 outpatients with any other personality disorder were randomly assigned to two subsamples, each consisting of 42 BPD and 102 other patients with personality disorders, with equal sex rates. The two samples were used to cross-validate Personality Belief Questionnaire items that discriminate BPD from other disorders. In both samples, the BPD group scored significantly higher than the controls on items related to themes such as helplessness, dependency, rejection and abandonment fear, distrust, fear of losing emotional control and attention seeking-dramatic behavior, which characterize BPD, but also other personality disorders. The fourteen strongest discriminative items formed a separate scale, on which the BPD patients of the second subsample scored much

higher than all the other patients. These results provide support for some of the assumptions that Young (2002) and Arntz et al. (1999) consider inherent to BPD, especially when authors control for other personality disorder traits. However, several other presumed BPD-assumptions (e.g., subjugation, guilt and punishment, lack of personal control) were not assessed and should be further studied.

#### 3.4.4. BPD interpretation bias

As BPD assumptions and schemas are expected to lead to biased interpretation of environmental and interpersonal stimuli (Beck et al., 1990; Young et al., 2003), several studies aimed to test this evaluation bias. For example, Barnow et al. (2009) used the thin-sliced judgments paradigm to test if 51 BPD patients, 23 depressive patients and 41 non-disordered controls differently evaluated traits of six persons in six filmclips. They found that BPD patients evaluated the persons as more negative and aggressive and less positive than non-disordered controls, and as more aggressive than depressive patients. Arntz, Weertman, and Salet (2011) examined the specificity of interpretations in BPD ( $n=17$ ), Avoidant and Dependent ( $n=30$ ), and Obsessive-Compulsive personality disorder ( $n=29$ ). They also included Axis I patient ( $n=26$ ) and non-patient ( $n=41$ ) control groups. Participants were instructed to visualize themselves in 10 scenarios describing mild to moderate negative events. BPD patients' reported feelings, thoughts and imagined behaviors in face of these scenarios showed a specific interpretation bias. The responses were low solution-focused, low healthy-flexible/accepting and highly other-criticizing and malevolent-interpreting. Sieswerda, Arntz, Mertens, and Vertommen (2007) compared BPD patients ( $n=16$ ) with patients with a cluster C personality disorder ( $n=18$ ), patients with an Axis I disorder ( $n=16$ ) and normal controls ( $n=16$ ) regarding their reactivity and hypervigilance to schema-related and -unrelated, negative and positive, supra- and subliminal person-related stimuli by means of transference in Stroop-color naming. Their hypothesis that the BPD patients were hypervigilant to emotional cues was confirmed, and concerned negative as well as positive cues. Regarding negative cues, hypervigilance was only observed in response to the schema-related stimuli, not to the non-schema-related stimuli. The authors presented various possible explanations for the relationship with positive cues, which is still unclear. On an automatic level the hypervigilance to schema-related negative cues of BPD patients was also higher (but with a marginally significant effect) than that to the negative schema-unrelated cues, a trend which was also observed in the Axis I patients, predominantly having an anxiety disorder.

Disorder-specific reactivity was also found in a controlled study with 40 BPD nonmedicated patients and 32 healthy participants, who were exposed to disorder-specific, neutral, pleasant and unpleasant imaginary scripts (Limberg, Barnow, Freyberger, & Hamm, 2011). The analysis of their heart rate, skin conductance and eye-blink responses showed that only scripts related to rejection and abandonment elicited increased emotional responses of BPD patients. An important influential aspect was the severity of trauma (PTSD comorbidity), which led to decreased reactivity. In this study, authors found disagreement between the objective arousal measures and the subjective self-report, in which BPD patient showed an overall negative affect.

In sum, results are mostly in line with the theory of more negativistic interpretations in BPD patients, which seem not related to all stimuli, but only to schema-related content, though the evidence is not strong in all studies. There are still unclear aspects, such as BPD patients found to be hypervigilant to positive emotional cues (Sieswerda, Arntz, & Kindt, 2007) and the incongruency between physiological and self-report measures (Limberg et al., 2011). Comorbidity with other disorders might be an important influential aspect on this matter.

#### 3.4.5. BPD schema modes

Lobbstael, van Vreeswijk, and Arntz (2008) examined associations between personality pathology and 14 of their hypothesized 22 self-

reported schema modes. In addition to Young et al.'s (2003) 10 schema modes, three schema modes were tested: the Enraged Child, the Undisciplined Child, the Detached Self-Soother. The schema mode Overcompensator was split in the Self-Aggrandizer, and the Bully and Attack mode. There were 489 participants (Axis I  $n = 127$ , Axis II  $n = 240$ , 'not otherwise specified'  $n = 23$ , healthy people  $n = 99$ ), of which 60.9% were female. Results showed that there were unique combinations of schema modes associated with all personality disorders. Some personality disorders were significantly correlated with many schema mode scales. BPD was the most eye-catching case; it correlated positively with ten schema mode scales. Especially the correlations with the scales measuring the BPD schema modes hypothesized by Young et al. (2003) were strong, also with the Abandoned and Abused Child schema mode, incorporated in the more general Vulnerable Child scale. BPD was negatively related to the adaptive schema mode scales Healthy Adult and Happy Child, as hypothesized by the ST model of BPD. A complication regarding the instruments in this study was the utilization of two different diagnostic questionnaires for psychopathology, which may have caused heterogeneity in the sample composition and patients' profiles. Nevertheless, the study provided moderately consistent evidence of the existence of some schema modes that might be specific for BPD.

Lobbestael et al. (2005) also tested the specificity of the schema model for BPD in a sample of 16 BPD patients, 16 Antisocial personality disorder patients and 16 nonclinical participants (all groups had eight men and eight women). The four theorized BPD-specific schema modes were assessed, as were the Healthy Adult and the Bully and Attack schema mode. The last is thought to characterize antisocial personality disorder (McGinn & Young, 1996). Both borderline and antisocial personality disorder patients scored higher than non-patients on the BPD maladaptive schema modes; however, the scores of BPD patients were significantly higher than those of antisocial personality disorder patients. The two clinical groups scored also higher than the controls on the Bully and Attack schema mode, but the difference did not reach statistical significance. Whereas antisocial patients and healthy participants scored high on the Healthy Adult mode, BPD patients scored significantly lower than both groups. The fact that 50% of the participants were male – to date the largest percentage of males in BPD studies – may have affected the results, as BPD has a higher prevalence in women than in men (APA, 2000).

Arntz et al. (2005) also investigated the specificity of the maladaptive schema modes Abandoned and Abused Child, Angry and Impulsive Child, Detached Protector and Punitive Parent for BPD, among 54 women (18 BPD patients, 18 cluster C patients and 18 non-patients). The participants reported about thoughts, feelings and behaviors characteristic of seven schema modes: the four Young's BPD maladaptive schema modes, the Overcompensator and Compliant Surrender modes, as control modes, and the Healthy Adult mode. As in the study of Lobbestael et al. (2005), evidence was found supporting Young's concept of schema modes and their BPD specificity; the BPD group scored higher on the four BPD schema modes than the other two groups. The non-patients also scored significantly higher on the Healthy Adult schema mode than both control groups, with the lowest scores in the BPD group.

Summarizing on the schema modes, BPD patients consistently scored lower than controls on the Healthy Adult mode and the evidence supports the Abandoned and Abused Child, Angry and Impulsive Child, Punitive Parent and Detached Protector schema modes as characteristic of BPD. Nevertheless, BPD patients also scored high on many other schema modes when these were included in the study design, which raises questions on the disorder-specificity of the schema modes as theorized by Young.

#### 3.4.6. Schema mode shifting pattern

The effect of stress on the flipping pattern of schema modes was also tested in the study of Arntz et al. (2005), by analyzing reported emotional states before and after watching two movie fragments,

one emotional, and one neutral. In general, only the emotional movie led participants to feel all negative emotions more intensively and to experience less happiness. The BPD group however felt significantly more fear than the other groups, and presented a significantly stronger activation of the Detached Protector schema mode (theoretically the most usual reaction for BPD patients to distress caused by internal or external threat). However, the shifts on schema modes were mild and not as extreme as Young pointed out, indicating that either the movie was just a mild emotional inductor or that Young's theory should be revised on this point (Arntz et al., 2005).

Other studies examining effects of stress induction on the shifting pattern of schema modes are from Lobbestael and colleagues. Using the same sample of 45 BPD, 21 antisocial personality disorder, and 46 cluster C patients and 36 non-patient controls, Lobbestael, Arntz, Cima, and Chakhssi (2009) and Lobbestael and Arntz (2012) examined the effects of induced anger through an interview on anger-related schema modes. Before anger induction BPD patients scored higher on the 12 schema modes, except for Self-Aggrandizer and Bully and Attack modes, compared to the overall sample mean. After anger induction BPD patients showed a stronger increase in the Angry Child and Detached Self-Soother mode scales, but not a stronger decrease in the adaptive modes, compared to the overall mean. These results were found after controlling for social desirability. Lobbestael and Arntz (2010) studied the effects of abuse-related stress. Participants viewed a 20-minutes film fragment in which a girl was abused and neglected by her parents and other caretakers. Composite scores were created as adaptive mode (Happy Child and Healthy Adult) and maladaptive mode (12 other modes) scores. At baseline, the BPD and cluster C groups scored higher on maladaptive and lower on adaptive mode scores than non-patients and patients with antisocial personality. The BPD group furthermore displayed a stronger increase in maladaptive mode scores after viewing the film fragment than the other groups. Although the adaptive mode scores decreased in the BPD group only, this decrease was not significantly stronger than in the other groups.

Johnston et al. (2009) asked 27 female and 3 male BPD patients about their maladaptive schema modes (only the five BPD schema modes), childhood trauma and dissociation experiences (e.g., depersonalization, amnesia, derealization). Patients' mental health was included as a possible confounder in the analyses. Patients with comorbid Axis I or II disorders were not excluded because the study focused on the borderline structure, and not on the specificity of the BPD diagnosis. No relationship was found between general mental health score and dissociation. Childhood abuse, reported by 90% of the participants, did not significantly explain variance of dissociation, but each schema mode explained some variance, which increased when schema modes scales were added to the models. The Angry and Impulsive Child and Abandoned and Abused Child scales accounted significantly for 52% of the dissociation variance in the full model. Overall, the evidence agrees with the theory; the higher the scores on schema modes are, the higher the dissociation scores are. Weak points of this study are its small sample and the use of an indirect dissociation measure. Due to lack of control for comorbid disorders, the exclusivity of the results for BPD patients remained unknown.

In sum, studies with varying stress stimuli found larger changes in schema modes in BPD patients compared to other patients and non-patient groups. Emotional, abuse- and neglect-related, as well as anger-provoking stimuli seemed to activate mode shifting in BPD, leading to increased report of maladaptive schema modes, but not always to a decreased report of adaptive ones. In addition, the degree to which schema modes seem to be activated (extracted from a reported score) appeared to be related to dissociation scores. However, the mode shifting does not seem to happen as abruptly as theorized (at least in an experimental setting). Also it is not yet clear whether there is a specific order of change of schema modes in BPD and whether these patterns are related to the extremely changing behavior seen in borderline patients.

Especially important to understand the shifting mode pattern in BPD (and maybe to understand the non-specificity of BPD EMSs and schema modes sometimes found in studies) might be the relationship between the activated EMSs and the displayed coping strategy, since hypothesized primary schemas like abandonment, mistrust/abuse and defectiveness/unlovability seem to relate to quite different schema modes, dependent on the coping strategy. In a large study in progress among a mixed group of 1602 patients, split in two for cross-validation purposes, Rijkeboer, Lobbestael, and Huisman-van Dijk (in preparation) have found evidence for a mediational model of the relationship between EMSs and schema modes by coping strategy. They found that when prominent BPD EMSs, such as abandonment, mistrust/abuse and defectiveness/unlovability, are triggered, the activation of related vulnerable child modes (e.g., Abandoned/Abused or Lonely/Inferior Child Mode) is mediated by the surrender coping strategy. In contrast, avoidant coping was found to mediate in the activation of the Detached Protector mode, whereas the overcompensatory coping seems to lead to activation of the Angry Child Mode or the Bully and Attack mode. Some other findings regarding secondary schemas like failure and punitiveness were that surrender coping leads to activation of the punitive parent mode, whereas overcompensation leads to activation of the Self-Aggrandizer mode (Rijkeboer et al., in preparation). In light of these new findings, it might have been a limitation of some of the reviewed studies (e.g., Lawrence et al., 2010; Lobbestael et al., 2008) to not have taken coping strategies into account when assessing schema modes or EMSs. The findings of Rijkeboer and colleagues are however preliminary findings that have not yet been formally published, so detailed information is still missing to make strong conclusions based on this study.

### 3.5. Effectiveness of schema therapy

The effectiveness of ST for the treatment of BPD has been evaluated in four studies. Two of the studies include single cases (Morrison, 2000; Nordahl & Nysæter, 2005) and are, therefore, methodologically weaker. One is a randomized controlled study of the effect of adding eight month-ST to group psychotherapy as usual (Farrell, Shaw & Webber, 2009). The final study (Giesen-Bloo et al., 2006) is a randomized two group design study comparing ST to the psychodynamic approach Transference Focused Psychotherapy (TFP), which also aims to contribute to overall personality change.

One of the single case studies (Morrison, 2000) concerns a standard cognitive therapy together with ST of a 29 year old woman. Unfortunately, no formal diagnostic instrument was used, resulting in the absence of data on baseline BPD symptom severity. The patient is described at baseline to present severe depression, anxiety, panic attacks, low self esteem and high scores on 12 of the EMSs, except on the Entitlement schema. At the end of the 73-session- treatment spread over 42 months (including six-4-month follow-up sessions), the patient's anxiety and depression scores were very low. By mid-treatment, the frequency and severity of negative and agoraphobic cognitions were reduced to 50%; the final results regarding these aspects were not measured. At mid-, end treatment and follow up, EMSs were markedly reduced, except the emotional deprivation schema. Though positive changes were reported, no formal statistical analyses were performed. The patient also used psychotropic medication during the first 25 months, but the study did not control for medication effect on the patient's improvement. In short, the lack of formal analyses and control makes the evidence found in this study weak.

The single case series trial of Nordahl and Nysæter (2005), with an A–B design and follow up assessment, was methodologically stronger than the first study, even though the sample was small and the comorbidity with other disorders (e.g., depression, eating disorder, avoidant personality disorder) was high. The female BPD patients ( $N=6$ ) were assessed for BPD and other Axis I and II disorders,

with a 10 month baseline assessment of depression and anxiety, where no spontaneous recovery occurred. Outcome measures were intensity of perceived distress, interpersonal distress, the GAF score, depression and anxiety, and maladaptive schemas assessed before treatment, at 20th, 40th session, post-treatment and after 12 months. There was only one therapist involved, who also did the assessments, which might have biased the results. The treatment consisted of weekly sessions of ST, as outlined by Young et al.'s. (2003), during an average period of 22 months (18–36 months range). No psychotropic medications were allowed during treatment. At follow-up, all six patients showed improvement on the six variables. The effect size was large for five of them, and small for one patient, who was the only participant who relapsed during the follow-up period; the other patients maintained the gains. Three of the patients did not meet all DSM-IV BPD criteria anymore. Though there was an increase of the mean GAF score (from 52 pre- to 68 post-treatment), all six patients continued showing some degree of global impairment and BPD symptoms at follow-up.

Farrell et al. (2009) compared ST with TAU by adding an 8-month group ST treatment (30 weekly sessions of 90 min) to ongoing weekly individual eclectic psychotherapy (TAU) and by comparing this combination to only TAU. The ST was adapted to group format to make this therapy more cost-effective and to enable profit of other group therapy advantages, such as peer support, opportunities to practice, and vicarious learning. The method was compatible to Young et al.'s. (2003), but contained extra elements, such as structural homework, kinesthetic exercises, psychoeducation, distress management, and emotional awareness exercises. There were four outcome variables, namely severity of general psychopathology, severity and frequency of BPD symptoms, meeting criteria for BPD diagnosis, and global functioning (GAF score), all measured at baseline, post-treatment, and at follow-up (after six months). Participants were 32 female BPD outpatients, 16 of whom received both treatments; whereas 16 controls, later 12 due to dropout, received only TAU. The attrition rates were 25% for the control group versus 0% in the ST group, the difference not reaching significance. The groups differed significantly at post-treatment and follow-up with the combination group showing large pooled improvement in all four outcome variables. At the end of treatment, 15 ST patients reached BPD remission, whereas 75% of the control patients were still diagnosed with BPD. Importantly, ST patients showed improvement on all aspects of the disorder (affect, cognition, impulses and interpersonal interaction) as measured by the Diagnostic Interview for Borderline Personality Disorders-Revised (DIB-R). These results were long-lasting and even improved in ST patients, whereas the controls deteriorated. These effects in controls might partly be related to the small sample size, but more importantly to the lack of BPD specific therapeutic work (Farrell et al., 2009). Therapeutic focus on schemas is included in this study, but the change of EMSs and schema modes, as the effects of (allowed) psychotropic medication were not documented.

Giesen-Bloo et al. (2006) provided to date the strongest evidence of the effectiveness of ST for BPD. Their sample consisted of 86 BPD outpatients of four health centers; 90% were women. Patients were randomly assigned to ST or TFP. Except for history of self-injury behavior, the groups were sociodemographically and clinically similar, for example regarding the number of comorbid disorders and psychopathology severity. Before randomization and afterwards every three months, BPD severity was assessed, together with quality of life, severity of general psychopathology and ST/TFP specific, as well as general personality aspects, such as self-esteem. After three years of ST and TFP, patients showed significant improvement in quality of life, and reduction of BPD symptoms, general psychopathology, and therapy specific outcomes. On all outcomes, patients of ST showed a larger treatment effect, such as regarding impulsivity, identity disturbance, fear of abandonment, (para)suicidality, quality of relationships,

and dissociative and paranoid ideation. These favorable effects were already noticeable after the first year and remained significant after controlling for use of psychotropic medication, and the baseline difference in history of self-injury (Giesen-Bloo & Arntz, 2007). The dropout risk for ST was significantly lower: 12 ST against 22 TFP patients terminated the treatment preliminary, mostly due to lack of faith in the treatment or the therapist. After three years, 45.5% of ST and 23.8% of TFP patients showed clinical recovery. At that time 27 (61.4% of total; 84.4% of ST-completers) ST and 19 (45.2%; 95% of TFP-completers) TFP patients were still in treatment. Follow-up results at four years showed further improvements, with the difference between ST and TFP still evident (e.g., 52 vs. 29% recovery), and most ST patients having finished treatment (Van Asselt et al., 2008). In addition, Sieswerda, Arntz, and Kindt (2007) found that hypervigilance to negative emotional stimuli decreased to nonpatients' level among the ST patients who recovered after three years, whereas patients who maintained high levels of BPD characteristics still showed high hypervigilance after three years. Such an outcome means fundamental changes in cognitive processes (Sieswerda, Arntz, Mertens, et al., 2007), which might warrant more long-lasting treatment effects.

The RCT (Giesen-Bloo et al., 2006) had some limitations. The patient's type of treatment was masked to the research assistants, and sometimes to the psychiatrists, but became unwillingly uncovered as the study progressed, which, though unlikely, could have influenced the results. Furthermore, medication was not randomized and even though medication was not associated with BPD severity at start of the trial, it was found to be negatively associated with the reduction of hypervigilance in recovered and non recovered patients. How medication use was associated with other outcomes is still unclear, but it might be the case that increased difficulty to treat is associated with medication use (Giesen-Bloo et al., 2006; Sieswerda, Arntz, & Kindt, 2007). The effect sizes of the single case series trial and the two RCTs discussed in this section are presented in Table 3.

### 3.5.1. Specific effects of ST

An important issue is whether ST has broader effects than other specialized treatments for BPD. This issue is important, as consumers tend to complain about the limited focus of treatments like DBT and MBT, reporting that the treatment does not address all range of problems characteristic of BPD (Katsakou et al., 2012). Unfortunately, most effectiveness studies reviewed do not systematically assess effects on all 9 DSM-IV BPD criteria. Instead, the traditional emphasis is on crisis, suicidal behavior and self-injury. Moreover, areas of problematic functioning not directly covered by the DSM-IV BPD criteria, like social and intimate relations, work and study, happiness and quality of life, are also not systematically studied. Lastly, in the absence of a second RCT directly comparing ST to other specialized treatments, any comparison of ST to other specialized treatments is problematic due to possible sample

differences. However, the Giesen-Bloo et al. (2006) study directly compared ST to TFP, and found ST superior to TFP in 6 (7 at 1 yr follow-up) of the 9 BPD criteria. Moreover, secondary measures, including symptom and personality indices, changed greatly, and here ST was also found superior to TFP. Quality of life also showed a steeper increase in ST. Lastly, ST appeared to be superior to TFP even in a TFP-specific instrument, assessing Borderline Personality Organization according to Kernberg's model (Arntz & Bernstein, 2006). Future studies are needed to investigate whether ST has indeed superior effects in areas like (intimate) relationships, identity problems, and quality of life, when compared to other specialized treatments.

### 3.5.2. Effectiveness of ST's elements

Nordahl and Nysæter (2005) reported that the main elements of ST were bonding with the patient through limiting re-parenting, schema formulation, working on schema modes and interpersonal coping skills, and problem solving. According to patients, the conceptualization of schema modes, the experiential techniques and the good therapeutic relationship would have been the most helpful elements. Nevertheless, no statistical analysis was performed to empirically corroborate this information.

The empirical evidence on the effectiveness of each of the elements forming ST is further still scarce. An exception is the study by Nadort, Arntz, et al. (2009) which examined whether telephone accessibility of therapists outside office hours was helpful, but could not find supporting evidence for the value of adding this element to the treatment protocol. A second exception exists regarding the influence of the therapeutic alliance in the outcomes of ST and TFP by Spinhoven, Giesen-Bloo, van Dyck, Kooiman, and Arntz (2007). Interestingly, both therapies have opposed views on the most adequate type of therapeutic relationship (Spinhoven et al., 2007). In ST, the therapist is closely involved with the patient and serves as a role model or, in some situations, as a substitute parent (re-parenting techniques), which according to the theory would promote positive change. TFP focuses on reframing the transference brought by the patient, so the therapist must withhold supportive reactions in order to avoid suppressing negative transference (Spinhoven et al., 2007). In this study, using the same data as the already reviewed Giesen-Bloo et al. (2006) study, the quality of the therapeutic relationship with the 78 outpatients was measured at 3, 15 and 33 months of treatment. Both patients and therapists gave their perceptions of each others' contribution to the therapeutic alliance, and completed personality and cognitive schema questionnaires to assess dissimilarity in pathological personality. The therapist also reported the degree of frustration felt while working with the patient. The treatment condition had a significant effect on therapeutic alliance, favoring ST. The ST patients' perception of the therapeutic alliance improved significantly through the treatment. The quality of the alliance reported by

**Table 3**  
Effect sizes of pre-post changes within ST conditions of BPD-severity.

Study name	Treated				95% confidence Interval	
	N	Max treatment length (months)	Treatment effect size Cohen's d	SE	Lower	Upper
Nordahl and Nysæter (2005) <sup>c</sup>	6	36	3.080	0.408	2.280	3.880
Giesen-Bloo et al. (2006) <sup>a</sup>	44	36	2.960	0.151	2.665	3.255
Farrell et al. (2009) <sup>b</sup>	16	8	1.895	0.250	1.405	2.385
Nadort, Arntz, et al. (2009) <sup>a</sup>	62	18	1.550	0.127	1.301	1.799

Note. All effects are based on intent-to-treat analyses. For Nadort, Arntz, et al. (2009), 18-month effects are reported. The 36 month follow-up has not been reported yet. From Jacob and Arntz (in press).

<sup>a</sup> BPDSI.

<sup>b</sup> DIB-R.

<sup>c</sup> As the Nordahl and Nysæter (2005) study did not have an index of BPD severity, the average effect size of the 5 outcome instruments was used.

the therapists was higher in ST. ST therapists also reported to be less frustrated as time passed by. These results were controlled for clinical improvement.

The analyses of the eight TFP patients who dropped out early (first 3 months), though based on incomplete data (missing patients' ratings), showed that the quality of the therapeutic alliance was significantly lower (Spinhoven et al., 2007). These patients were also significantly described as more frustrating by the therapists. The analyses of the other 30 patients who dropped out later, showed that early perception of the therapeutic alliance, particularly by therapists, significantly predicted the time of dropout, resting importance to baseline BPD severity and type of treatment. Personality and cognitive dissimilarity between patients and therapists contributed positively to the development of the therapeutic alliance as rated by the patient. However, neither the dissimilarity, nor the quality of the therapeutic alliance was a significant predictor of clinical recovery after three years. Thus, although the patients' ratings of the therapeutic alliance seemed to predict outcome, after controlling for treatment condition, the effect disappeared. This means that, agreeing with Young's model, the therapeutic alliance is a very important factor in ST, even more important than in TFP.

The same RCT (Giesen-Bloo et al., 2006) was used by Spinhoven, Giesen-Bloo, van Dyck, and Arntz (2008) to investigate if therapists' prognostic assessments, part of clinical daily practice, were related to patient characteristics and treatment outcome. In the study, 28 therapists of 71 ST and TFP patients participated. Prognostic assessments did not relate to the patients' biographical characteristics age, gender, and educational/employment level, and the clinical characteristics BPD severity, psychiatric symptoms, and number of Axis I and II disorders. Therapists rated the probability of success for ST to be higher than for TFP. Patients who have been rated as less likely to be successful had a higher chance on dropout. After statistically controlling for patient characteristics, the prospective assessments did accurately predict the outcome indices BPD severity and which BPD patients failed to change reliably or had not recovered after 3 years of therapy, the latter in TFP only. This study suggests that therapists are able to prospectively assess outcome indices of BPD therapy independent of patient characteristics. In sum, evidence supports the assumption that a good therapeutic alliance affects ST outcomes positively.

### 3.5.3. ST implementation possibilities

In the Netherlands, Nadort, van Dyck, et al. (2009) have studied ST implementation possibilities for BPD treatment. Between 2004 and 2009 the team conducted three studies including a survey assessing the barriers and promoting factors for ST implementation, a survey on the nationwide hindering and promoting factors, and a training program in ST for therapists based on a set of DVDs showing its techniques.

The results of the first survey, among 49 therapists and 23 managers of 29 mental healthcare institutes, showed that the majority of the institutes (77.8%) counted with a treatment for BPD. The mean satisfaction with these treatments was, however, rather poor (4.9 out of 10). The majority of the therapists and managers were willing to try another treatment for BPD, whereas one fourth was interested in other treatments, but not yet willing to change. It became clear that more availability of scientific evidence of treatment effectiveness, therapists' freedom to choose or reject ST; and support of clinical and BPD patients' organizations were important facilitating factors for ST implementation in the clinical practice. Barriers mentioned were a long implementation period and the election of this treatment because of financial or managerial reasons. The second survey in 2008 among therapists, managers and directives of treatment teams of 22 mental healthcare institutes, yielded similar results. Next to the promoting factors already mentioned in 2004, participants reported positive attention for ST in the media and evidence that the treatment has an impact in the patient's personality

structure. New hindering factors mentioned were the travel distance to receive supervision and the need to offer telephone support to the patients outside working hours.

For the training program in 2005, a six hour DVD was produced containing important elements and ST techniques outlined by Young et al. (2003). Eight therapists of various institutions learnt the techniques in the DVD in a 50-hour group training program. Treatment adherence and competence were assessed with assistance of video-taping. Both showed to be sufficient or good, with one therapist performing below average. The satisfaction with the training was also very high. Training by DVD appeared a good option for teaching ST techniques, facilitating implementation. However, the authors address the importance of supervision and peer support, which was not structurally included in the program.

Based on the previous results, Nadort, Arntz, et al. (2009) realized a RCT with a multicenter design to evaluate ST implementation for BPD in regular mental healthcare settings. As telephone crisis support outside working hours was indicated as hindering factor for implementation, authors tested its additive value by allocating this variable randomly to one of two therapy groups. After stratification, 16 of the 31 therapists gave extra phone support to 32 of the 62 randomized patients with a main BPD diagnosis. The patients (96.7% women) were assessed for BPD pathology severity, general psychopathology, quality of life, and type of dysfunctional schemas before, every six months during and after the treatment that consisted of 45-min sessions twice a week during the first year, and once a week during the second year. The therapists received a 50 hour ST training program with DVDs.

The analyses at 18 months of treatment showed that 13 patients (21%) dropped out, one successfully terminated her treatment after one year, 42% recently recovered, and the others were still in treatment. Both groups showed significant positive changes in comparison with their baselines outcomes in general and BPD psychopathology (covering all the DSM-IV criteria), maladaptive schemas and quality of life (effect sizes are reported in Table 3). There were no between-group differences neither regarding these effects nor the mean number of therapy sessions, being 71 for the extra support condition and 67 for the condition without it. There was neither any significant difference between groups in recovery rate (41.9% experimental vs. 43.3% control condition) nor Reliable Change (51.6% experimental vs. 63.3% control condition). The therapists' adherence to the treatment was excellent, meaning that the ST techniques and methods were used appropriately. There was, however, a significant difference between groups concerning the global and ST specific competence of the therapists, which were higher in the group without extra phone support, but this factor did not affect the results.

The overall results of this implementation study were similar to those of the randomized controlled study. However, it is worth noting that the implementation study's sample reported less severe psychopathology and less psychotropic medication use at baseline than that of the controlled study (Nadort, Arntz, et al., 2009). The results of the implementation study indicate that ST could be implemented successfully in normal mental health care settings. Nevertheless, the results can only be applied to the Netherlands and countries with a similar mental health care setting. As this study was also a highly controlled form of implementation, the effects of a less tight form of ST treatment program are still unknown (Nadort, Arntz, et al., 2009).

### 3.5.4. Cost effectiveness

Based on Giesen-Bloo et al.'s (2006) randomized controlled study, Van Asselt et al. (2008) demonstrated that, in the Netherlands, ST was more cost-efficient than TFP. To calculate cost-effectiveness, the proportion of recovered patients and their health-related quality of life were related to the BPD-related costs (e.g., formal and informal care, expenses on medication or drugs) made by the patients at baseline and

every three months. To ensure accuracy, the uncertainty intervals of cost data were estimated with bootstrap analyses with 1000 replications. In the ST condition, the recovery rate was higher (59% vs. 29% for TFP) and the societal costs over 4 years were lower (€37,826 ST vs. €46,795 TFP). However, the difference between treatments concerning total societal cost was non-significant and only informal care was significantly less expensive in the ST group. The probability of ST to be cost-effective was moderate to high. Depending on the value threshold that society establishes to pay for extra effectiveness, the probability of being cost-effective ranged between over 90% in the best-case scenario to over 60% in the worst-case scenario. This study faced the difficulty to avoid biases in the patients' cost reports and include the costs exclusively caused by BPD and not by other comorbid disorders like depression or drug addiction.

### 3.5.5. Work in progress and not yet published effectiveness studies

Three open pilot trials into inpatient application of group ST for severe BPD have been completed, with varying sample size ( $N=41$ ,  $N=36$  and  $N=16$ ; Reiß, Lieb, Arntz, & Shaw, *in press*). Large effects on borderline severity measures (Cohen's  $d$  ranging from .77 to 2.15) and low dropout were found, but an important finding was that it is important to apply Farrell and Shaw's specific Group ST protocol. For instance, with one instead of two therapists the effectiveness of group ST reduces remarkably. This is understandable from Farrell and Shaw's (2012) group ST model, that emphasizes that one therapist should pay attention to the patients and keep them all involved, whilst the other addresses a specific issue or works with one specific patient.

One pilot study assessing feasibility and effectiveness of the combination of two year group and individual outpatient ST for BPD has been completed but not published yet. The study included 18 BPD patients, and found high effectiveness of the group-individual ST combination, with Cohen's  $d=2.7$  at 2.5 yr follow-up (Dickhaut & Arntz, *in preparation*). The strong effects and potential cost-savings of group ST has led to a large scale international RCT, assessing effectiveness, cost-effectiveness, fundamental changes, and patients' and therapists' views on the treatment. The study compares two variants of group ST, a group-only and a combined individual-group model, to TAU. It will take several years before the study is completed (Arntz et al., 2012).

## 4. Discussion

The overall aim of the present paper was to make a comprehensive evaluation of ST for the treatment of BPD. Therefore, we analyzed the cohesiveness and validity of Young's theoretical framework behind the proposed mechanisms of change, and we reviewed the clinical results obtained until now with ST. Two specific objectives were established. First, we wanted to examine if ST, specifically in the frame of BPD, can be empirically founded. Second, we studied how effective and feasible this therapy is for the treatment of BPD.

Concerning the first objective, evidence has been found for a considerable number of elements of the schema model; however, the foundation in some cases is not too strong, nor always consistent, and there are also still empirical blanks in the theory. Regarding the origins of the EMSs seen in BPD, a connection has indeed been found between negative and traumatic experiences in childhood and adolescence on the one hand and BPD psychopathology on the other hand. This relationship, however, is not direct and has not always been confirmed (see Lobbstaël et al., 2005), but the reports of childhood abuse among borderline patients are always high or higher than among non-patient controls (Arntz et al., 1999; Lobbstaël et al., 2005; Specht et al., 2009). The maladaptive schemas on mistrust, abandonment, defectiveness and insufficient self-control seem to mediate general childhood maltreatment and BPD severity (Specht et al., 2009). The evidence regarding the influence of sexual abuse is ambiguous: it sometimes does not have any effect on BPD

severity (Specht et al., 2009), but at other times it is a determinant factor of the BPD symptoms (Arntz et al., 1999) and the clinical course of BPD (Zanarini et al., 2006).

The indirect relationship between traumatic experiences in the past, like childhood maltreatment, and the development of BPD agrees with Young (1990). According to Young (1990), the negative experiences with the environment interfere with the realization of the five tasks or needs of development he proposed (connectedness, autonomy, worthiness, reasonable expectations, and realistic limits). As a result, children begin to use maladaptive schemas and coping strategies that lead to distress and future complications. However, to date, no empirical studies exist, at least to our awareness, that confirm the existence of the presumed developmental needs and their relation to BPD schema formation and distorted relationships with the caregivers. Furthermore, authors criticize Young's theory around needs, as lacking a strong theoretical framework and explanation of how the five needs were selected, as well as an empirical research program that benefits from other disciplines as biology, motivational and evolutionary psychology (Flanagan, 2010). Recently, though in a sample including a small percentage of personality disorder subjects, Thimm (2010) attempted to contribute to the schema theory conceptualization through empirical research in a study examining the relation between EMSs and developmental tasks, as formulated by Erikson's (1950) psychosocial model of personality development, which due to its interactional character, is similar to Young's model. The author found that 12 of 15 assessed EMS were predictive of unsuccessful resolution of the theorized developmental tasks which goes in line with the theory formulated by Young. The schemas self-sacrifice, entitlement and unrelenting standards, were nevertheless positive predictors of development tasks (trust, autonomy and industry). All in all the need for more research in this matter, also specific focused on BPD, is large. It is also regrettable that no empirical study was found evaluating the concept of coping styles (overcompensation, surrender and avoidance), as formulated by Young, or their roles in different developmental phases related to BPD psychopathology. These styles, according to ST theory, concern how BPD patients behaviorally cope with the distress caused by EMSs and contribute to the persistence of the maladaptive schemas in adulthood (Young et al., 2003). The only retrieved study on coping styles (Rijkeboer et al., *in preparation*) is not yet published and does not address directly how coping strategies contribute to the maintenance of EMSs and symptoms. This study, however, underscores the importance of coping strategies for determining the schema modes.

The specific EMSs or schema domains that should be targeted during therapy for BPD have not yet been clearly established. Young proposed 18 EMSs, but only 15 of them could be assessed with the schema questionnaires in many of the reviewed studies (e.g., Lawrence et al., 2010; Nilsson et al., 2010). Another complicating factor is that borderline patients score higher than controls on too many EMSs (up to 12). They mainly report assumptions belonging to the disconnection/rejection domain (Arntz et al., 1999; Butler et al., 2002; Jovev & Jackson, 2004; Lawrence et al., 2010), but they also score high on EMSs from other domains (Lawrence et al., 2010) and other personality disorders (Butler et al., 2002). The different proportion in which borderline patients meet DSM-IV criteria for BPD seems to play a crucial role here (Lawrence et al., 2010). DSM criteria are not strongly enough (or not at all) correlated to EMSs, so the predictive value of EMSs is deficient when it comes to define the specific DSM-IV criteria of BPD patients (Lawrence et al., 2010).

It is important to remark that the factor structure of the BPD is still under discussion. Various studies found evidence for the plausibility of a two- or three factor structure of the current DSM-IV BPD (for review, see Taylor & Reeves, 2007). To the possible subtypes belong those with identity problems; those with affective and relational instability; and those with behavioral dysregulation (Bachrach, Croon, & Bekker, 2012). It might be relevant to examine the actual structure

of BPD, taking into account that the structure might vary across the various subtypes, for clinical and non-clinical samples, and across assessment methods, before making conclusions about the predictive value of Young's EMSs concerning the DSM criteria.

The same phenomenon of non-specificity has been noticed regarding the schema modes. BPD seems to correlate strongly with the four maladaptive schema modes theorized for this psychiatric disorder (Abandoned and Abused Child, Angry and Impulsive Child, Detached Protector and Punitive Parent) (Arntz et al., 2005; Lobbestael et al., 2005, 2008), supporting the element of schema modes. Nevertheless, BPD also correlates with schema modes corresponding with other personality disorders (Lobbestael et al., 2008), raising questions about the additive value of the schema mode concept, as the simplifying function of the schema modes seems to be lacking (Lobbestael, 2008). Moreover, if BPD patients do present significantly more schemas and schema modes than the characteristic four, then they would not be receiving the adequate help with ST as it is currently structured.

Based on the reviewed literature, some possible explanations for non-specificity found in the studies can be tentatively mentioned. First, non-specificity of EMSs and schema modes in BPD might be related to the mediating role of coping strategies recently found between the activation of EMSs and schema modes. It seems that the activation of the same EMSs could lead to different schema modes, dependent on the coping strategy (Rijkeboer et al., in preparation). As none of the reviewed studies could take this novel finding into account, there might be important underlying mechanisms missed. Second, the non-specificity of EMSs and schema modes could also point to a greater psychopathology complexity of BPD. The findings of Johnston et al. (2009) contribute to this idea, as they show that the number of schema modes is positively related to the levels of dissociation reported by BPD patients. Finally, as BPD patients usually show increased scores on all kinds of self-report measures (e.g., Limberg et al., 2011), non-specific heightened scores on EMSs and schema modes might reflect a broad negativity bias in BPD. As mentioned earlier, BPD patients seem to be more vigilant than other groups to negative, positive and abuse-related stimuli (Limberg et al., 2011; Sieswerda, Arntz, & Kindt, 2007). This together with their more negativistic interpretations of environmental stimuli (Arntz et al., 2011; Barnow et al., 2009) might lead to a constant fluent of EMS-triggering stimuli that might also contribute to an overall negative affect.

The flipping pattern of schema modes was also confirmed in four studies (Arntz et al., 2005; Lobbestael & Arntz, 2010, 2012; Lobbestael et al., 2009). In the experimental settings used in these studies, patients did show fluctuations between different schema modes when confronted with stressful situations that included abuse-related or anger-provoking stimuli. The schema modes Detached Protector (Arntz et al., 2005), Detached Self-Soother and Angry Child (Lobbestael & Arntz, 2010; Lobbestael et al., 2009) became especially active after exposure to the stimuli. However, the changes were not as abrupt as hypothesized by Young. All in all, more research, that also examines the shifting pattern in real-life situations, should be conducted to clarify the mixed empirical evidence existent on the mechanisms of this phenomenon.

Concerning the second objective of this paper, all reviewed studies on effectiveness show that ST is associated with many positive outcomes. The results of the single case and the single case series, for instance, indicated positive effects on anxiety and depression levels, agoraphobic symptoms, number and intensity of EMSs, global functioning and perceived distress (Morrison, 2000; Nordahl & Nysæter, 2005). Moreover, ST adapted to a group format resulted in large effects in the reduction of general psychopathology, BPD severity, affective instability, impulsivity and overall mental health status, and higher symptom remission rate than in the control group (Farrell et al., 2009; Stoffers et al., 2012). In addition, ST had more (moderate) positive effects on BPD symptoms, such as impulsivity, fear of abandonment and (para) suicidality than only psychodynamic techniques encapsulated in TFP (Giesen-Bloo et al., 2006). Although on a composite measure of

secondary outcomes representing various aspects of psychopathology ST was superior to TFP (Giesen-Bloo et al., 2006), no significant difference was found on the general psychopathology (SCL-90) between ST and TFP (Stoffers et al., 2012). In sum, ST showed to lead to beneficial effects, especially on many facets of BPD psychopathology in both individual and group settings and compared to TAU and other specialized BPD treatment. However, the number of RCTs conducted to evaluate the efficacy of ST is still very small, and in a recent review on psychological interventions for BPD, TFP showed to have less efficient than desirable, even non-significant unfavorable, effects on aspects such as parasuicidality, depression, anxiety and general psychopathology, when compared to an unspecified control therapy (Doering et al., 2010; Stoffers et al., 2012). Therefore, the need of comparing ST with more robust treatments for BPD is high. In addition, more research is needed that aim to replicate the observed results (Stoffers et al., 2012) and to assess whether ST also shows superior effects in other equally important aspects, such as (intimate) relationships, identity problems, and quality of life, when compared to other specialized treatments.

Also in the light of effectiveness evaluation, since ST was conceived as an improved version of cognitive therapy for personality disorders, it should lead to better results to be considered as a therapy of additional value. Thus, based on the mentioned shortcomings of traditional cognitive therapy, ST should be able to 1) clarify the BPD patients' vague problems, and the situations that awake their distress, 2) bring them closer to their therapists, 3) break with their rigid belief systems and maladaptive behaviors, and 4) teach them to embrace their feelings and thoughts instead of avoiding them (McGinn & Young, 1996; Young, 1994). The methods and strategies of ST are indeed chosen and organized in a way that, theoretically, all the mentioned aspects could be achieved. The empirical demonstration of this notion is yet missing.

The therapeutic alliance seems to be one of the differentiating factors between both therapies, as this was rated higher by patients and therapists in the ST group, which influenced particularly the dropout rates (Spinhoven et al., 2007), that also were related to negative prognostic assessments made by the therapists at the beginning of the therapy (Spinhoven et al., 2008). Such findings confirm how valuable the ST's interpersonal techniques are in the therapeutic process. It is worth noting that, although the results on the RCTs may let us assume that the schematic work to change EMSs is the causative factor of the improvement seen in BPD patients, there might be other mechanisms involved, such as changes in attentional processes. For instance, the study of Sieswerda, Arntz, and Kindt (2007) contributes to this reflection. They found that only recovered BPD patients showed a significant reduction in hypervigilance to negative emotional stimuli. In the future, it might be relevant to carry on with this thought stream.

Implementation and cost-effectiveness studies in the Netherlands also show that at the moment it is possible and economically convenient to introduce ST in normal mental healthcare settings (Nadort, Arntz, et al., 2009; van Asselt et al., 2008). A considerable percentage of therapists and managers of institutions wants better treatments for BPD (Nadort, van Dyck, et al., 2009; van Asselt et al., 2008). Moreover, the Dutch society would benefit from the lower costs of ST that, compared with TFP, spare almost €9000 per patient, despite the intensity of the treatment (van Asselt et al., 2008). ST becomes also more attractive and more cost-efficient because ST therapists could be trained successfully with a set of DVDs (Nadort, van Dyck, et al., 2009), and the supportive contact with the therapist outside working hours appeared to be irrelevant for the outcome of ST (Nadort, Arntz, et al., 2009).

#### 4.1. Limitations

There were some limitations in this review paper, which were mainly related to the fact that ST, despite its increasing popularity, is a new clinical field of study. As a result, the number of empirical

research that has been done concerning the theoretical framework or the effectiveness is still limited. The conclusions that have been drawn on these two aspects of ST should be taken with caution since many of the results were based on small samples or samples consisting of non-clinical students and have not been replicated by other investigators. In addition, although the proportion women-men included in the reviewed studies, very generally speaking, reflected the current reported prevalence of BPD in community samples of around 70% women and 30% men (Lieb et al., 2004), it is difficult to establish if the present conclusions are also valid for men, as none of the samples included large percentages of men, very few studies controlled their results for gender and the results were not separately discussed for men and women. Furthermore, the follow up periods of the clinical trial might as well not be long enough to draw conclusions on the long-term effects of ST. Besides, the study results that we have revised are as strong as the capacity of the instruments used by the authors to measure ST elements. These instruments might not be able to capture the whole meaning of each of the ST theoretical constructs, limiting also the validity of our conclusions.

ST is becoming very popular in the Netherlands due to a team of scientists who have studied BPD, ST and the interaction of both themes for already some time (e.g., Arntz et al., 2005; Giesen-Bloo et al., 2006; Lobbestael et al., 2005; Spinhoven et al., 2007). The studies of the Dutch team are the greatest source of empirical knowledge about ST. This asks a certain level of caution in the interpretation of the results, given that these could be unintentionally biased towards supporting ST. Nevertheless, the studies performed by the Dutch team followed strict guidelines and were classified as having a low risk of bias in a recent extensive review on psychological interventions for BPD (Stoffers et al., 2012), which allows confidence in the reliability of their results. Also, independent RCT studies from two research groups from other countries found similar results (Farrell et al., 2009; Nordahl & Nysæter, 2005).

Finally, the present article aims to make a comprehensive (rather than a detailed) evaluation of ST. For this reason, the studies focusing on the diagnostic instruments and factor analyses have not been reviewed. The results have also not been organized according factors such as gender, age, ethnicity or social status of the participants. Neither the clinical history of the BPD patients nor their comorbid diagnoses was taken into account to establish if the schema model functioned differently in different populations or ST led to different outcomes. This, however, could be the case and should be further examined.

#### 4.2. Conclusions and future directions

With still caution we can conclude that ST is based on a relatively cohesive theoretical model and that there seems to be sufficient evidence for its validity. A great deal of its elements and the traced connections between these elements have been found at least once to function or be activated in the expected ways. In order to consolidate the theory behind ST, it would be important to replicate many of the reviewed studies and their results. Some parts of the proposed theory for which evidence is still mixed, lacking or incomplete should also be studied. For instance, the early developmental phase of BPD should be more extensively investigated to determine the causal mechanisms between maladaptive assumptions, EMSs and maladaptive coping styles, and the traumatic experiences during childhood. Further research should also aim to determine if there really exists a pattern of EMSs and schema modes for BPD, and to establish the structure of BPD that is included in the diagnostic manuals.

Concerning the effectiveness of this therapy for the treatment of BPD, we can be positive, but not totally certain yet due to the small amount of methodologically-good efficacy studies. Up to date there is no single psychotherapeutic treatment that offers robust evidence of efficacy (Stoffers et al., 2012), but when compared with other treatments, such as DBT and MBT, it becomes clear that there is still

considerable work to do on ST. It would be interesting to directly compare ST to standard cognitive therapy in various randomized controlled studies across various countries and health care institutions. Such clinical trials could also be organized to further evaluate ST in group format, which showed to lead to especially good results (Farrell et al., 2009), and to examine if ST transcends the results achieved by the other specialized treatments for BPD, especially DBT, for which there is up to date the most evidence of efficacy (Stoffers et al., 2012). However, Lynch et al. (2007) do well in warning that the comparability between different therapies might be limited, and that it might be more fruitful to study the therapeutic mechanisms of change of each therapy. In this aspect, ST has also still a lot to learn. Dismantling studies, such as the study of Nadort, Arntz, et al. (2009) regarding the contribution of crisis support outside working hours to the therapeutic outcomes, could lead to valuable knowledge that allows a more efficient ST. The implementation of ST seems at the current time possible in the Netherlands, but it is unknown how accepted ST is in other countries. Hopefully, this paper motivates investigators from all over the world to fill in the remaining gaps regarding ST with their research.

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