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CONTENTS

Chapter 1

General introduction

Patients with borderline personality disorder (BPD) and antisocial personality disorder (ASPD) are both characterized by very diverse and even contradictory personality features. Fragmentation goes hand in hand with BPD since instability constitutes the core feature of this disorder. Borderline patients display rapid shifts in emotions to intense levels of distress, fear and anger. In relationships, they try to get very close to other people, but push them away when the relationship becomes too close, which is threatening or painful for them. Also, their feelings towards the same person can vary from very loving to extremely hateful. Furthermore, they can behave extremely impulsive and have an unstable sense of self. There are also several contradictions in ASPD patients. While many ASPD patients are seemingly compliant and healthy, they are often very impulsive and can have extremely angry outbursts. Additionally, while people with ASPD are frequently abusive towards other people, there is a conflict in the sense that they often were victimized in the past themselves. Furthermore, their frequent lying, self-justification and contradictions in their reports can give rise to confusion about the antisocial patient' s personality. These different fragments in the personalities of BPD and ASPD patients can be difficult to integrate and can cause them to feel lost in fragmentation.

Schema modes refer to exactly these different parts of personality. Schema modes are rooted in Schema-Focused Therapy (SFT) and indicate the different cognitive, emotional and behavioural states that may be present in a person. In this dissertation, the presence of schema modes will be assessed in patients with personality disorders (PDs) and therefore, schema modes constitute one of the three pillars of the current dissertation. Furthermore, this dissertation will focus on two specific themes that are very prominent in BPD and ASPD; trauma and anger. More specifically, traumatic events in childhood of PD patients will be assessed, and the effects of confrontation with abuse- and anger-related stress will be tested in BPD and ASPD patients.

Some studies of this dissertation were specifically set up to compare BPD to ASPD, while others take a broader perspective and include additional axis I or II patient groups. In this introducing chapter, first BPD and ASPD are outlined. Next, similarities between both disorders are discussed, followed by an introduction on schema modes, childhood trauma and anger. Then, direct and indirect assessment methods are introduced since both were used in the presented studies. Finally, the specific research goals and outline of this dissertation are given.

DEFINING BORDERLINE PERSONALITY DISORDER

BPD is one of the most complex PDs because of the great variety and quick fluctuations of symptoms that are associated with it. The term BPD literally refers to pathology that is situated on the `border` between neuroses and psychosis (Stern, 1938), and this way already implies problems of definition (Clarkin & Lenzenweger, 1996). Indeed, while most other PDs have a quite straightforward central theme (e.g., suspicion in paranoid PD, attention-seeking in histrionic PD and dependence in dependent PD), the core of BPD is difficult to pinpoint and probably is best described as instability. This instability expresses itself in interpersonal relationships, self-image, affect and impulsivity (APA, 2005). The DSM-IV-TR BPD criteria are presented in table 1. Pragmatically, the most well-known symptoms of BPD are recurring

crises, hospitalizations, automutilation, suicide attempts, addiction, and depressive, anxious and aggressive episodes, making this disorder notorious for its complex treatment. The prevalence of BPD in the general population is 2%. Furthermore, 10% of the patients from outpatient mental health clinics and 20% of psychiatric inpatients suffer from BPD (APA, 2005).

Table 1: DSM-IV-TR diagnostic criteria of borderline personality disorder

A pervasive pattern of instability of interpersonal relationships, self-image, and affect, and marked impulsivity beginning in early adulthood and present in a variety of contexts, as indicated by five (or more) of the following:
1. Frantic efforts to avoid real or imagined abandonment. Note: Do not include suicidal or self-mutilating behaviour covered in Criterion 5.
2. A pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation.
3. Identity disturbance: markedly and persistently unstable self-image or sense of self.
4. Impulsivity in at least two areas that are potentially self-damaging (e.g. spending, sex, substance abuse, reckless driving, binge eating). Note: Do not include suicidal behaviour, gestures or threats, covered in Criterion 5.
5. Recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour.
6. Affective instability due to a marked reactivity of mood (e.g. intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days).
7. Chronic feelings of emptiness.
8. Inappropriate, intense anger or difficulty controlling anger (e.g. frequent displays of temper, constant anger, recurrent physical fights).
9. Transient, stress-related paranoid ideation or severe dissociative symptoms.

Source: American Psychiatric Association (2005, p 710).

DEFINING ANTISOCIAL PERSONALITY DISORDER

ASPD is the most prevalent DSM diagnosis in forensic settings (Hildebrand & de Ruiter, 2004). The DSM-IV-TR describes the crucial clinical feature of ASPD as ``a pervasive pattern of disregard for and violation of the rights of others``(APA, 2005). ASPD is composed out of two facets. First, an essential precursor of ASPD is conduct disorder before the age of 15 that involves a repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or rules are violated. Symptoms of conduct disorder can be divided into four categories: aggression to people and animals, destruction of property, deceitfulness or theft, and serious violations of rules. Second, the pattern of criminal behaviour must persist into adulthood, expressed in at least three criteria like repeated illegal acts, irresponsible behaviour and dishonesty (APA, 2005). The ASPD DSM-IV-TR criteria are presented in table 2. Unlike other PDs, the DSM operationalizes ASPD almost uniquely with behavioural criteria. Because of the absence of personality traits in the diagnosis of ASPD, antisocial individuals are very heterogeneous

with respect to personality, attitudes and motivations for engaging in criminal behaviour (Hare, 1996). Three % of men from the general population and 1% of women suffer from ASPD. Prevalence estimates within the clinical settings vary from 3 to 30% (APA, 2005).

Psychopathy (PP) has a strong overlap with ASPD. PP is not rooted in the DSM tradition but stems from the view proposed by Cleckley (1976) and Hare (2003). The PP diagnosis is based on 20 criteria that reflect four underlying dimensions: interpersonal (e.g., superficial charm and grandiose sense of self-worth), affective (e.g., lack of remorse and shallow affect), lifestyle (e.g., impulsivity and irresponsibility) and antisocial (e.g., juvenile delinquency and criminal versatility). In their turn, these four facets have demonstrated to load on two higher-order factors, the interpersonal/affective and the lifestyle/antisocial factor (Bolt, Hare, Vitale, & Newman, 2004). The most common way to assess PP is by means of the Psychopathy Checklist – Revised (Hare, 2003), on which 20 criteria can be scored. Each PP criteria is scored as absent (score 0), doubtful (score 1) or present (score 2) and, according to European norms, patients with a total score of 25 or more are considered psychopaths (Grann, Langström, Tengström, & Kullgren, 1999; Hare, 2003). Unlike ASPD, criminal behaviour only forms one aspect of PP, and additional large emphasis is put on personality features. While most psychopaths are also antisocial, only 1/3 of antisocials are psychopathic (Meloy, 1988). Experimental studies aiming at disentangling cognitive, emotional and behavioural correlates of ASPD and PP are essential to determine the value of these disorders for the forensic setting.

Table 2: DSM-IV-TR diagnostic criteria of antisocial personality disorder

A. There is a pervasive pattern of disregard for and violation of the rights of others occurring since age 15 years, as indicated by three (or more) of the following:

1. Failure to conform to social norms with respect to lawful behaviours as indicated by repeatedly performing acts that are grounds for arrest
2. Deceitfulness, as indicated by repeated lying, uses of aliases, or conning others for personal profit or pleasure
3. Impulsivity or failure to plan ahead
4. Irritability and aggressiveness, as indicated by repeated physical fights or assaults
5. Reckless disregard for safety of self or others
6. Consistent irresponsibility, as indicated by repeated failure to sustain consistent work behaviour or honor financial obligations
7. Lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another

B. The Individual is at least age 18 years.

C. There is evidence of a Conduct Disorder with the onset before age 15 years.

D. The occurrence of antisocial behaviour is not exclusively during the course of Schizophrenia or a Manic Episode

Source: American Psychiatric Association (2005, p 706).

WHAT BORDERLINE AND ANTISOCIAL PERSONALITY DISORDER HAVE IN COMMON

BPD and ASPD have several features in common. Partly, this thematic overlap is inherent to the fact that both disorders are part of the dramatic-emotional cluster B of axis II of the DSM (APA, 2005). Additionally, BPD and ASPD share specific diagnostic criteria like impulsivity, inadequate anger control, difficulty in affect regulation and unstable relationships (APA, 2005; Holdwick, Hilsenroth, Castlebury, & Blais, 1998). Furthermore, both patient groups are characterized by manipulative behaviour and frequent suicide attempts (APA, 2005). Three striking patterns emerge with respect to the epidemiology of these two disorders. First, both disorders have at about the same prevalence in the general population (2%, APA, 2005). Second, the gender distribution in both disorders is completely opposed in that about 80% of BPD patients are female and 80% of ASPD patients are male (Paris, 1997). The DSM-IV-TR states that ASPD might be underdiagnosed in females because of the emphasis on aggressive items. Third, most studies report a 10 to 25% rate of co-occurrence of BPD and ASPD diagnoses (Zanarini & Gunderson, 1997). Additionally, 55% of delinquent adolescents with a diagnosis of ASPD also meet criteria for BPD (McManus, Alessi, Grapentine, & Brickman, 1984).

This high level of communalities between the two disorders and the contrasting gender distribution has lead some authors to mark BPD and ASPD as `mirror diagnoses`, suggesting that the difference between BPD and ASPD might be primarily a definitional artifact or even that BPD represents a female form of male-dominant ASPD (Gunderson & Zanarini, 1987; Hudziak, Boffeli, Kriesman, Battaglia, Stranger et al., 1996; Paris, 1997). In this thesis, three foci are selected in which BPD is compared to ASPD; schema modes, childhood trauma and anger.

SCHEMA MODES

Schema modes are one of the three pillars of SFT. SFT is an elaboration of the traditional cognitive-behavioural treatment of Beck (Beck, Freeman, & Davis, 2004), developed by Young in the early `90s (Young, 1990; Young, Klosko, & Weishaar, 2003). SFT originally started with the two basic concepts of Early Maladaptive Schema's (EMSs) and coping responses. EMSs are broadly defined as the unconditional and dysfunctional underlying beliefs about the self and one's relationships with others that are developed during childhood and serve to selectively filter incoming experiences. Since EMSs refer to stable cognitive structures, they constitute the trait concepts of SFT. Coping responses reflect the three ways in which people can behave in order to maintain their maladaptive EMSs; first, they can fight the schema as though the opposite were true (overcompensation), second, they can avoid the schema to be activated (avoidance) and third, they can give in to the schema (surrender).

Young introduced the third pillar of schema modes to SFT because some patients, especially BPD patients, exhibited very complex and elaborate combinations of EMSs and coping responses. Furthermore, certain EMSs and coping responses seemed to occur frequently in fixed combinations under specific circumstances. Thus, schema modes were added to SFT as state concepts that represent the moment-to-

moment emotional states as well as a person' s coping responses, both adaptive and maladaptive (Young et al., 2003). Modes are not new on a conceptual level (Beck et al., 2004). Since modes are built out of EMSs and coping responses, the innovative aspect of the mode concept lies in its operationalization (i.e. the specific clustering of EMSs and coping responses) and the state-like characteristic. Patients usually have several modes. One of these modes will dominate the other modes and determine the patient' s current emotional, behavioural and cognitive state. Changing of dominant modes is assumed to occur in reaction to internal or external cues, which is referred to as mode switching or mode flipping (Young et al., 2003). Mode switching could account for the rapid changes in mood and behaviour of e.g., borderline patients, and for the sudden outrages violent outbursts of antisocial patients.

Young hypothesized that patients with certain PDs are characterized by a specific set of schema modes. Five maladaptive schema modes are thought to underline BPD. First, the Abandoned and Abused Child, which has a direct link with their abuse history. Second, the Impulsive Child that acts on non-core desires or impulses from moment to moment in a selfish or uncontrolled manner to get his or her needs met, with little regard to possible consequences for the self or others. Third, the Angry Child that parallels the central place of excessive and misplaced anger in the DSM-IV BPD criteria and the angry protect against perceived or past abuse. Fourth, the Punitive Parent mode that originates from the harshly punishing and rejecting family environment BPD patients often experienced (Young, 2005; Young et al., 2003). Finally, BPD patients are assumed to possess a Detached Protector mode, allowing them to emotionally disconnect from the negative emotions caused by the other dysfunctional modes. Originally it was assumed that the mode conceptualization of ASPD patients highly resembled that of BPD patients in that these five modes were also central for ASPD with an additional Bully and Attack mode in which the patient directly harms other people in a controlled and strategic way emotionally, physically, sexually, verbally, or through antisocial or criminal acts. Nowadays, the mode concept is applied to nearly all PDs. Until now, 22 modes have been suggested of which 14 have been operationalized in self-report questionnaires. Mode-work forms the main treatment focus of SFT in patients with severe PDs. A recent randomized clinical trial has shown SFT to be superior to psychodynamically based Transference-Focused Psychotherapy in reducing BPD-specific and general psychopathologic dysfunction and in improving quality of life (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006). Furthermore, SFT has been implemented at a large scale in forensic treatment settings, especially in the Netherlands, England and the US (Bernstein, Arntz, & de Vos, 2007). Despite these highly promising therapy effectiveness results, the theory on schema modes has not been empirically tested until 2005.

CHILDHOOD TRAUMA

Childhood trauma includes both abuse and neglect. Abuse refers to active maltreatment in which perpetrators intentionally hurt their victim, either sexually, physically or emotionally. Neglect is the withdrawal of caretaking, whether not fulfilling someone's basic emotional needs (e.g., giving attention and love) or the child's physical needs (e.g., food or cloths). The infliction of childhood trauma can have noxious effects

for the child's development and is a precursor of many forms of pathology in adulthood (Briere & Runtz, 1990; Margolin & Gordis, 2000). Traumatic experiences in childhood have been put forward as etiological precursors of BPD and ASPD. Numerous studies focused on the link between trauma and BPD and found that at about 80% of these patients experienced some or multiple types of trauma in childhood (Zanarini, Williams, Lewis, Reich, Vera et al., 1997). While several studies suggest a unique link between BPD and sexual abuse (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Yen, Shea, Battle, Johnson, Zlotnick et al., 2002) other studies found BPD to be associated with several other abusive events, such as emotional abuse and neglect and physical abuse (Battle, Shea, Johnson, Yen, Zlotnick et al., 2004; Bernstein, Stein, & Handelsman, 1998; Bierer, Yehuda, Schmeidler, Mitropoulou, New et al., 2003; Bradley, Jenei, & Westen, 2005; Golier, Yehuda, Bierer, Mitropoulou, New et al., 2003; Johnson, Cohen, Chen, Kasen, & Brook, 2006). This high level of empirical attention to childhood trauma in BPD has caused the BPD-patient to be strongly associated with a victim-status. Indeed, many therapeutic approaches for BPD pathology stress the importance of processing traumatic experiences as a key component in therapy.

ASPD and childhood trauma on the other hand, are usually not mentioned in one breath. At least three explanations can be given for that. First, trauma history of ASPD patients has not been studied as systematically as that of BPD patients. Second, antisocials are typically seen as offenders instead of victims. Third, ASPD patients are characterized by a denying response style making it less likely that they will spontaneously mention their abusive past. Nevertheless, childhood trauma did obtain a position in the explaination of violent behaviour of ASPD patients through the cycle of violence hypothesis. This hypothesis refers to intergenerational transmission of childhood abuse and basically states that people repeat the aggressive behaviour towards others that was displayed towards them as a child (Egeland, 1979; Egeland, Jacobvitz, & Sroufe, 1988). In line with this hypothesis, ASPD has mostly been associated with physical abuse (Bernstein et al., 1998; Dutton & Hart, 1992), and to a smaller degree with sexual abuse (Bierer et al., 2003).

Although there are quite a large number of studies targeting the relationship between specific types of traumas and PDs, hardly any study used appropriate comparison groups. Moreover, the attribution of specific abusive precursors of PD pathology was mostly based on comparison with one (sometimes even healthy) control group. Perhaps equally important as disentangling the relationship between specific forms of traumas and PDs, is studying the impact of abuse-related stimuli on emotional reactivity in patients with severe childhood trauma. Only recently, studies like these have been set up targeting emotional rating, physiological and brain-imaging related changes (Schmahl, Elzinga, Ebner, Simms, Sanislow et al., 2004; Schmahl, Elzinga, Vermetten, Sanislow, McGlashan et al., 2003). Research like this can contribute to the knowledge on the specific processes that occur in trauma survivors when confronted with these stimuli. In the long run it can contribute to the development of therapeutic techniques for actively coping with and processing of childhood trauma's.

ANGER

It is surprising how few empirical studies have been devoted to anger compared to other basic emotions such as sadness or fear. Especially considering anger can have devastating consequences when it is expressed in such a way that it causes others physical or emotional harm, thus when anger leads to aggression. Possibly, anger is understudied because people are afraid that the anger will be expressed outwards. Because of these possible negative consequences, ethical issues are at stake in experimentally inducing anger. Inadequate anger control plays a crucial role in both BPD and ASPD (APA, 2005). Anger is probably the core issue of ASPD, because of the strong link between anger and aggression (Lish, Kavoussi, & Coccaro, 1996), and the fact that the ASPD diagnosis almost uniquely focuses on aggression (APA, 2005). Antisocial patients usually vent their anger outwardly, and often so extreme that it leads to violent offences. In BPD patients on the other hand, anger can be expressed in two directions: it can be directed inwardly resulting in self-harming actions, and it can be expressed outwardly in aggressive behaviour. This different focus of anger in BPD and ASPD can perhaps be ascribed to gender differences in that men tend to externalize and women tend to internalize anger. So, as is the case in the general prevalence of BPD versus ASPD, gender probably plays a major role in the expression of anger of both groups.

Interestingly, studies examining the impact of experimentally induced anger in BPD and ASPD patients are sparse. Regarding BPD, a study of Jacob, Guenzler, Zimmerman, Scheel, Ruesch et al. (in press) found a significantly prolonged, but not a stronger anger reaction in the BPD group compared to non-patient controls when anger was induced by a short story. Likewise, based on self-report of affect intensity, Koenigsberg, Harvey, Mitropoulou, Schmeidler, New et al. (2002) concluded that BPD patients did not report a higher level of characteristically experienced intensity of anger than patients with other PDs. Although these studies do not seem to support Linehan's notion of emotional hyperresponsivity in BDP patients (Linehan, 1993), further research is necessary, especially since the above mentioned studies were solely based on self-report and lacked clinical control groups. To our knowledge, no study assessed the effect of experimentally induced anger in ASPD patients. Nonetheless, it is crucial to find out which stimuli trigger anger and/or aggression, and how the response pattern of these patients differs from that of other patients. Pinpointing the precursors and reactivity of anger, allows for a better understanding of the risk factors of deregulated anger and for developing more focused treatments of disproportional anger for ASPD patients.

DIRECT VERSUS INDIRECT ASSESSMENT

Direct assessment refers to each method in which people are directly asked to report their emotions, thoughts or behaviours. In contrast, indirect measures aim at assessing information about the person that is not intentionally given and thus cannot be captured by conscious introspection or cannot be easily controlled (De Houwer, 2006). Indirect assessment methods are especially important in patients with a denying response style or in patients who tend to be dishonest in their responding, in order to increase the possibility of getting accurate information. Antisocial and psychopathic patients in particular have

been frequently associated with unreliable self-report. For example, ASPD patients have been shown to be characterized by defensive responding, and a smaller percentage of antisocial diagnoses can be made based on questionnaire-assessment as compared to semi-structured interviews (de Ruiter & Greeven, 2000). This has caused several authors to advice against the sole use of self-report methods for forensic patients. Hare (2003) for example strongly suggests the use of collateral information to assess the level of PP, and the DSM-IV recommends the same for ASPD assessment (APA, 2005). When considering indirect assessment, several methods are available. Three often-used methods are other-report, psychophysiology and implicit reaction time based paradigms.

Regarding other-report, informant data can be gathered from personal acquaintances of the patient like a spouse, family member, or friend, or from the patient's therapist. In order to increase the chance of objective appraisal of the subject's characteristics, the use of therapists as informants is preferable (Klonsky, Oltmanns, & Turkheimer, 2002). Psychophysiological assessment has a long tradition in psychological literature (Mucha, Pauli, & Weyers, 2006). Although there have been attempts to link specific emotions to specific sets of physiological responses, these endeavors were mostly unsuccessful (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000; Cacioppo, Klein, Berntson, & Hatfield, 1993; Ekman, Levinson, & Friesen, 1983; Jäncke, 1996; Roberts & Weerts, 1982; Schwartz, Weinberger, & Singer, 1981; Sinha, Lovallo, & Parsons, 1992; Sinha & Parsons, 1996), and only yielded differential physiological response patterns for activation versus sedation reactions. Consequently, when examining physiological correlates of emotions like anger or depression, it is best to combine different physiological assessment methods like heart rate, blood pressure and skin conductance. Most indirect measures of associative cognitive structures are based on the Implicit Association Task (IAT, Greenwald, McGhee, & Schwartz, 1998). With the IAT, the strength of association between a target concept and an attribute concept is assessed by comparing the response times for two differentially combined discrimination tasks. Participants are instructed to categorize stimuli of the concepts that appear on the computer screen by means of two response buttons. The idea behind the IAT is that it should be easier to map two concepts into a single response when those concepts are somehow similar or associated in memory than when the concepts are unrelated or dissimilar (for a more detailed description see De Houwer, 2002; Greenwald & Farnham, 2000). Additionally, previous studies in psychopaths indicated that implicit association tasks are effective in revealing abnormal associations of psychopaths towards violence (Gray, McGullah, Smith, Morris & Snowden, 2003) and moral cognitions (Cima, Tonnaer & Lobbestael, 2007).

THESIS` AIMS AND OUTLINE

Overall, 9 main research questions will be addressed in this dissertation. They are grouped into three clusters:

I. *Schema modes*

1. Is the Schema Mode Inventory (SMI) a reliable and valid mode assessment instrument?
2. Which modes are central in which PD?
3. How do ASPD patients` self-report of schema modes differ from their therapists` reports?
4. Is there evidence for the mode-switching hypothesis after confrontation with trauma- and anger related stress in BPD and ASPD patients?

II. *Childhood trauma*

5. Is the Interview for Traumatic Events in Childhood (ITEC) a reliable and valid childhood trauma assessment instrument?
6. Which kinds of childhood traumas are related to which PDs?
7. What is the effect of confrontation with abuse-related stress on self- reported emotions, phychophysiology and indirect cognitive self-abuse association in BPD and ASPD patients?

III. *Anger*

8. What is the most effective method to make people angry?
9. What are the consequences of inducing anger on self-reported emotions, pshychophysiology and indirect cognitive self-anger and aggressor-swearword associations in BPD and ASPD patients?

This dissertation contains ten studies (one theoretical article, two validation studies and seven experimental studies) that are organized in three parts.

PART I focuses on schema modes and consists of 5 articles. The central research question of this part is which modes are central in which PDs. *Chapter 2* concerns a theoretical description of schema modes and its research status. In *Chapter 3*, a questionnaire for assessing the presence of modes, the Schema Mode Inventory, is presented. This 124-item questionnaire measures the presence of 14 modes. Several aspects of reliability and validity are assessed; the factor structure, internal reliabilities of the subscales, correlations with EMSs, test-retest reliability, monotonically increase of the modes from non-patients to axis I to axis II patients and construct validity. A first empirical study on mode assessment in patients with BPD and ASPD is reported in *Chapter 4*. An additional focus of this study was comparing severity of childhood trauma history in BPD and ASPD patients as compared to healthy controls. *Chapter 5* describes a study in which the relationships between 10 PDs and 14 schema modes were assessed, allowing an examination of mode presence in the full range of PDs. *Chapter 6* examines the agreement between patient's reports of schema modes and the report by their therapists. Three patients groups are included in this study: patients with BPD, patients with ASPD and patients with a cluster C PD (avoidant, dependent and/or obsessive-

compulsive PD). This way, it was tested whether the denying response style of ASPD patients would be reflected in a lower patient-therapist agreement on mode presence as compared to BPD and cluster C patients.

Childhood trauma is the focus of PART II, which consists of 3 chapters. This part had two main foci; first, to test which types of childhood trauma are related to which PDs and second, to study how patients with BPD and ASPD differ with respect to abuse-related reactivity. In *Chapter 7* an interview to assess the presence and severity of childhood trauma is presented: the Interview for Traumatic Events in Childhood (ITEC). The ITEC assesses 5 kinds of traumas: sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect. A factor analyses was performed, as well as tests of internal consistency and inter-rater reliability, convergent and criterion validity. *Chapter 8* tests the correlations between the 5 forms of abuse and 10 PDs. In *Chapter 9*, a study is presented in which participants from four groups (BPD, ASPD, cluster C PD and non-patients controls) were confronted with an abuse-related movie fragment. Before and after this stress induction, self-reported emotions and schema modes, as well as physiological reactivity, and implicit cognitive associations between the self-concept and abuse were assessed to test the emotional, cognitive and physiological correlates of abuse related stimuli.

The central theme of PART III is anger and includes 2 chapters. This part of the dissertation concentrates on anger reactivity in BPD versus ASPD patients. In *Chapter 10*, it was investigated which anger induction method was most effective. Four different anger induction methods were compared by means of self-reported anger and anger-related physiological reactivity; film, punishment, interview and harassment. *Chapter 11* reports a study in which the effect of anger on self-reported emotions, modes and physiology was assessed in BPD, ASPD and control groups. In addition, the effect of the anger induction on implicit cognitive associations between self and anger, and between the aggressor of the participant and swearwords was examined. Special attention was given in this study to the differentiation between ASPD and PP.

Finally, in *Chapter 12*, a summary of the studies is given. Results are critically discussed and implications for therapy and suggestions for future studies are provided.

PART 1

SCHEMA MODES

Chapter 2

Shedding light on schema modes: A clarification of the mode concept and its current research status

An adjusted version of this chapter is published as:
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ABSTRACT

While the schema mode construct is one of the main concepts of Schema-Focused Therapy (SFT) for personality disorders (Young, 1990; Young & Klosko, 1994; Young, Klosko, & Weishaar, 2003), the mode concept lacks clear theoretical and scientific embedding, and therapeutic guidelines about when to use modes in clinical practice are not always clear. Therefore, the current article aims at clarifying schema modes theoretically and by therapeutic vignettes. Modes are different aspects of the self, that reflect the currently active cluster of cognitions, emotions and behaviours (Young et al., 2003). The different schema modes are presented, as well as mode conceptualizations for several personality disorders. The distinction between healthy and pathological modes is outlined, as well as the link with dissociation and the concept of mode switching. Furthermore, mode assessment in SFT is addressed, next to theoretical studies on schema modes. Whilst recent progress in treatment possibilities and effectiveness of SFT is impressive, basic tests of the modes are limited. Finally, directions for further studies are suggested.

INTRODUCTION

Schema-Focused Therapy (SFT) is becoming an increasingly popular and widespread variant of cognitive therapy for treating personality disorders (PDs). A study by Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al. (2006) demonstrated SFT to be superior to psychodynamically based Transference-Focused Psychotherapy in reducing borderline PD (BPD)-specific and general psychopathologic dysfunction and in improving quality of life. Three main concepts are central in SFT. The first is that of *Early Maladaptive Schemas* (EMSs), which are broadly defined as the unconditional and dysfunctional underlying beliefs about the self and one's relationships with others. EMSs are developed during childhood and serve to selectively filter incoming experiences such that schemas are extended and elaborated throughout an individual's lifetime. Behaviours are embedded in the *coping styles* that form the second main feature in SFT. Young postulates a person can maintain their EMSs by means of three coping methods; overcompensation (fight the schema as though the opposite were true), avoidance (avoid the schema to be activated) and surrender (give in to the schema) (Young et al., 2003). Because of the close link of both EMSs and coping styles to basic cognitive theory constructs (Beck & Freeman, 1990; Beck, Freeman, & Davis, 2004) and the increasing number of studies targeting the theoretical underpinning of these constructs (see e.g., Ball & Cecero, 2001; Jovev & Jackson, 2004; Petrocelli, Glaser, Calhoun, & Campbell, 2001), EMSs and schema coping are concepts that are well known in clinical practice. However, most researchers, practioners and patients are less acquainted with the third SFT concept of *schema modes*. The unfamiliarity with the concept of schema modes is due to the fact that it is a new and quite a difficult construct that emphasises many elements. Therefore, the current article aims at clarifying the mode concept, both on a theoretical level as well as on a clinical level. By means of clinical vignettes the concept and how it is used in treatment is illustrated. Also, the current status of research on mode assessment and experimental studies is described, and recommendations for further studies are given.

FROM SCHEMA'S TO SCHEMA MODES

While the schema approach proved to be a valuable model for treating many patients, schema assessment in patients with BPD posed an extra challenge because these patients recognize many different schemas, and several schemas can be active at the same time (in extreme cases of BPD as many as 15 schemata at once), making it difficult to pinpoint concrete therapy goals. Furthermore, patients with severe PDs can seem calm and in control most of the time, and all of the sudden burst into anger or become very sad. These rapid changes in behaviours and feelings, reflective of emotional instability, cannot be accounted for sufficiently by means of the EMS concept, since these schemas are conceptualized as trait constructs referring to stable underpinning of personality. Additionally, it appeared that certain schemas and coping responses were always triggered together. Young blended a number of these schemas and coping strategies together narrowing down the number of them, and refers to these sets of matching schemas and coping responses as schema modes (Bamber, 2004; Young et al., 2003). The standard definition of schema modes is: "those schemas or schema operations -adaptive or maladaptive- that are currently active for an individual" (Young et al., 2003). This way, the introduction of modes into SFT does not imply the addition of a new content-related aspect, but merely provides a different unit of analysis, making schemas and coping features more manageable. While some modes are primarily composed of schemas, others represent mainly coping responses. Schema modes reflect the emotional and behavioural state at a given moment in time in an individual, and comprise thoughts, emotions and behaviours. Thus, in essence, there are two main differences between schemas and modes. First, schemas reflect a one-dimensional theme (e.g., Defectiveness), while modes are broader and reflect a combination of several schemas (e.g., the EMSs of Defectiveness and Emotional Deprivation are both part of the Lonely Child mode) and/or coping strategies. Second, schemas are stable, trait constructs, while modes alter depending on the situation one is in, and thus are state concepts that are strongly related to the present emotional state of the patient.

Frank, a 42-year-old postman with a major depression and an obsessive-compulsive PD, tells his therapist about a situation where he helped a woman whom he liked and of whom he thought that she liked him to. However, she sent him away after he had helped her without thanking him. This event triggered several schemas within the patient: Mistrust/abuse because he thought the women acted like this in purpose to humiliate him, Abandonment because he was convinced the women abandoned him in favour of someone better, Defectiveness because he felt stupid because of how he acted and Emotional Deprivation because he felt he did not get the emotional support he wanted from the women. In response to this event, he called this woman a couple of hours later and begged her to go on a date with her (overcompensation coping method), till the point she told him to get lost. The therapist and the patient are struggling with what schema or coping method is most important in this situation. They conclude that these schemas and coping response co-occurred in reaction to a strong feeling of abandonment, making this situation better

to understand by clustering the schemas and coping response into the Abandoned and Abused Child mode. This is an example of a situation that triggers so many schemas in a patient, that it becomes difficult to pinpoint the therapy goal. Consequently, in cases like these, it is more useful to conceptualise the elicited thoughts, behaviours and emotions in terms of a schema mode.

MODES AND DISSOCIATION

Each person holds several modes within him/herself, so the modes can be seen as different aspects of one's personality. These different parts of the self can cause a patient feeling fragmented in that some facets of identity have not been fully integrated with the self. This does not imply modes are entirely separated; although modes can operate independently of each other, a person does have access to several modes at a certain moment in time. Thus, they do not operate without awareness of each other. Therefore they cannot be seen as separated entities that are divided by amnestic barriers, as is for example thought to be the case in the Dissociative Identity Disorder, in which it is assumed that certain aspects of personality are unaware of the presence of others and function as independent persons (Young et al., 2003).

Jessica is a 25-year-old woman with BPD who calls her therapist in a crisis. She started injuring herself and felt that something had to be done to prevent that she might become suicidal. She had a fight with her boyfriend because she was very angry when he refused to comfort her after she got scared of hearing of the death of a good friend because he was to busy at the moment. As a first response, Jessica felt abandoned and vulnerable (Abandoned/Abused Child mode). Her despair grew and she began to view her boyfriend as no longer wanting her, which raised strong anger in her. She then got in a furious rage, in which she accused her boyfriend of rejecting her and not loving her, and yelled at him and hit him (Angry Child mode). She left the house in anger, telling her boyfriend that he had to move out of the house before she got back, and drove of with her car. While driving her car in a rather dangerous driving style, she gradually realized how she had behaved towards her partner and started to feel guilty. When she returned at her home, her boyfriend had indeed left, triggering her abandonment feelings (Abandoned and Abused Child) after which she started to feel extremely guilty that she had send him away and physically attacked him (Punishing Parent). She then started to cut herself because she felt she had to punish herself for her misbehaviour. When discussing this incident in the next therapy session, Jessica says the very diverse emotions she felt and behaviours she experienced made her confused about her self. This example illustrates the difficulty patients with very distinct modes can have in maintaining a unified sense of self. Note that she was able to remember those different emotional and behavioural states afterwards.

DIFFERENT SCHEMA MODES

Modes can be comprised of both healthy and pathological aspects, and are centred round specific, and very diverse themes. Maladaptive modes can reflect a sort of regression into intense emotional states experienced as a child causing patients to appear highly childish, while other modes can be reflective of an overdeveloped coping method, or the copying of behaviour displayed towards them by their parent that has been eventually internalised (Young et al., 2003).

Until now, 22 different schema modes have been identified. These include the 10 central modes that are listed in Young et al. (2003), but also subdivisions of these modes that are hypothesized to characterize specific PDs. It is likable more modes will be identified in the future, when mode conceptualisation of all personality disorders is completed. The 22 schema modes can be grouped into four main categories. The first group is that of child modes. These are innate and universal modes, meaning that all children are born with the potential to manifest them (Young et al., 2003). On the one hand, maladaptive variants of child modes develop when certain core needs were not met in childhood, and can centre round themes of vulnerability, anger or lack of discipline. On the other hand, when childhood needs were adequately met, a person develops a Happy Child mode, representing the capacity to experience and express playful happiness. The second group reflects the dysfunctional coping modes that correspond directly to the three coping styles of overcompensation, avoidance and surrender. The dysfunctional parent modes form the third mode group and reflect internalized behaviour of the parents towards the patient as a child. More specifically, children internalize frequently displayed behaviour of their parent towards them as a part of their self. The last mode group is that of the Healthy Adult mode which includes functional cognitions, thoughts and behaviours (Young et al., 2003). Detailed definitions of the 22 schema modes, and their division into the four central categories and associated themes are depicted in the appendix (adapted from Bernstein, Arntz, & de Vos, 2007, and Young et al., 2003).

MODES AND PERSONALITY DISORDERS

Each person exhibits several characteristic schema modes, but some combinations appear typically for certain PDs. According to Young et al. (2003), the BPD is characterized by four primary maladaptive schema modes; (1) the Abandoned and Abused child, which is not surprisingly given the high prevalence of childhood abuse in borderline patients, (2) the Angry Child that parallels the central place of excessive and misplaced anger in the DSM-IV BPD criteria, and (3) the Punitive Parent mode that originates from the harshly punishing and rejection family environment BPD patients often experienced (Young, 2005; Young et al., 2003). Most of the time however, BPD patients find themselves in the (4) Detached Protector mode, providing them with the opportunity to emotionally shut off from the negative emotions caused by the other dysfunctional modes, and giving them a safe hiding place. Since patients seem quite at ease in this mode, therapists often confuse this Detached Protector mode state with the Healthy Adult mode, while in fact they are shutting off their emotions and avoid dealing with them (Young et al., 2003).

Although mode conceptualization originated from the work with BPD, it is now applied to other diagnostic categories as well. The mode conceptualization of antisocial PD (ASPD) highly resembles that of BPD in that the Abandoned and Abused Child, Angry Child, Punitive Parent, and Detached Protector are also central to ASPD patients. This can be explained by the similarity of diagnostic criteria of BPD and ASPD (Lobbestael, Arntz, & Sieswerda, 2005; Paris, 1997). However, Young postulates ASPD patients display a fifth additional maladaptive schema mode; the Bully and Attack mode. Additionally, the Angry Protector mode, the Conning and Manipulative mode and the Predator mode are assumed to play a central role in antisocials high in psychopathy (Bernstein et al., 2007).

The third PD that has been conceptualised in terms of schema modes is the narcissistic PD (NPD). Their default mode that dominates self-representation is that of the (1) Self-Aggrandizer. In order to deal with emotions of loneliness, NPD patients switch to the (2) Detached Self-Soother mode. Underneath the flamboyant representation, lies the (3) Lonely Child mode, which narcissists avoid to be activated in order to cover up their vulnerability (Young et al., 2003). Arntz and Bögels (2000) elaborated this model with the (4) Enraged Child mode, which narcissists switch to as a final defence to the eliciting of the inferior position of the Lonely Child, when external causes can be found that can be attacked and destroyed.

Recently, mode models for five other PDs have been proposed. Modes that are hypothesized to be central in the avoidant PD are the avoidant protector (a variant of the Detached Protector in which avoidance is the prominent strategy), the Compliant Surrender, the Lonely Child, and the Critical Parent. The dependent PD is thought to be characterized by the Compliant Surrender, in combination with the Dependent Child, and the Critical Parent mode. Central for the obsessive-compulsive PD are the modes of the Critical Parent, and the Lonely Child, while patients with paranoid PD are characterized by an Avoidant Protector and a Humiliated and Abused Child (a variant of the Abandoned and Abused Child mode). Both patients with obsessive-compulsive and paranoid PD display the Overcontroller mode. The Obsessive type uses order, repetition, or ritual (Perfectionistic Overcontroller), while the paranoid type attempts to locate and uncover a hidden (perceived) threat (Suspicious Overcontroller). To conclude, the histrionic patient has the mode of Attention and Approval Seeker, Undisciplined/Impulsive Child and the Ignored or Inferior Child.

To our best knowledge, only two studies tried to test the mode conceptualisations of PDs in borderline and cluster C PDs Arntz, Klokman, and Sieswerda (2005) and borderline and antisocial PDs (Lobbestael, Arntz, & Sieswerda, 2005), as compared to healthy controls. Both studies found evidence for the hypothesised modes of the Abandoned and Abused Child, Angry Child, Detached Protector and Punitive Parent being specific for BPD. Antisocial patients displayed the same pattern of modes, and also demonstrated the highest level of Bully and Attack mode, although not significantly higher than the borderline patients.

Elisabeth, a 33-year-old patient with a BPD, is looking with a glaze in her eyes. When one of the patients in the group therapy asks her what is going on, she answers; ``Nothing`` (Detached Protector mode). When other patients say that they do not believe Elisabeth, that it seems as if she

is detached, she becomes angry and says; ``Oh just leave me alone. Nothing I do is right. I destroy everything. I do not deserve to live. I deserve a horrible death instead (Punishing Parent mode).`` When the therapist says that it must be horrible to feel so bad about yourself, Elisabeth looks at him for one moment as if she wants to attack him, then it seems that she will give a cynical response, but seeing how the other group members are looking at her with interest, she starts to cry (Abandoned and Abused Child mode). This fragment describes how a patient switches between three modes in a short time span in response to reactions of the other group members and the therapist.

FROM NORMALITY TO PATHOLOGY

Schema modes are not unique markers of pathology; to a certain degree, everybody holds several modes. Rather than reflecting distinctive entities, modes of healthy people and patients differ in a gradual way on several dimensions. Firstly, healthy persons have recognisable modes but their feeling of a unified sense remains intact, while dissociation between modes increases with the severity of pathology (Young et al., 2003). Secondly, healthy people are able to simultaneously experience more than one mode at the same time and in this way blend modes together. Movement to another mode often occurs gradually and seamlessly. In contrast, patients with severe PDs display more sudden shifts between pure modes and experience only one mode at the time, e.g., when anger takes over the patients` personality (Bamber, 2004; Young et al., 2003). Furthermore, healthy persons acknowledge their modes more easily than patients, and their modes are more adaptive, mild and flexible. So while patients display a higher number and intensity of modes, they do not generally display *different* modes than healthy people (Young et al., 2003). This way SFT provides a less stigmatised view of pathology; it contains the message everybody has different sides in him/herself but in severe pathology the balance between these modes is lost.

MODE SWITCHING

While a person is characterized by several schema modes, at a given moment in time, only one mode is predominant and determines the current behaviour of patients with severe pathology. This dominant mode shuts off the other modes. Predominant modes can become dormant and visa versa. This altering of modes is often experienced as a sudden and abrupt shift and is referred to as mode switching or `flipping` (Bamber, 2004; Young et al., 2003). This phenomenon explains the abrupt changes in thoughts, feelings and behaviours often observed in BPD patients. In contrast to most patients with PDs who are often trapped in a rigid style (e.g., obsessive-compulsive patients), borderline patients are often in a state of flux, with rapid altering in displayed behaviours and emotions. When switching into a specific mode, this mode appears to overshadow other modes that seem to disappear. Schema modes can elicit one another, and appear in varying strength and order, without the patient having control on this. Modes are triggered in reaction to changes in the environment or internal cues, linked to life situations to which people are oversensitive or which push their `emotional buttons`. In other words, depending on the situation, a whole other side of patients can be seen (van Genderen & Arntz, 2005; Young, 1990). This way, the mode model

provides a valuable explanation why, although there is severe pathology, patients with e.g., antisocial PD can appear so normal; at that moment there probably are no cues causing them to flip to e.g., aggressive modes.

Participants of the study by Arntz et al. (2005) filled out a state version of the SMI before and after a stress induction by means of a BPD-specific emotional movie fragment. Results demonstrated the Detached Protector mode increased significantly more in the BPD group as compared to both control groups of cluster C PDs and healthy participants. Studies like these that manipulate emotions in the laboratory raise the likelihood of assessing true changes in emotions, rather than merely on a hypothetical or cognitive level, and in a way turn 'cold' cognitions into 'hot' ones. This makes emotion inductions very valuable for gathering information on how patients would react in daily life to emotions, and provide the opportunity of studying the effect of changing environmental stimuli on mode switching.

Jack, a 36-year-old patient diagnosed with an antisocial PD and having been in prison for killing his neighbour after a fight in which he felt offended, is receiving therapy for partner-relation problems. Jack comes to the fourth session, well dressed and speaking very friendly and polite to the therapist. When the therapist asks how he is doing and how it is with his wife, Jack avoids the question. The therapist, being surprised of his avoidance confronts Jack: ``Jack, I believe you were telling me last time that you had a quarrel with your wife. Now that I am asking how the two of you are getting along you seem to avoid answering my question.`` It appears that this remark pushes one of Jack`s emotional buttons as Jack suddenly snatches to the therapist to mind his own business. This patient that first seemed so friendly, suddenly becomes out disproportionally furious and threatening. This fragment illustrates how a patient can switch from a seemingly healthy mode to an aggressive mode because of a trigger in his environment.

ASSESSMENT OF MODES

Dysfunctionality of modes can be assessed in two ways: by mapping their frequency, and their intensity. In other words; a mode can be problematic when its dominates the person most of the time, or when it pops op extremely intense. In general, there are three ways of tracing schema modes in patients. First, by probing patients about problematic situations and reframing their displayed behaviours, thoughts and feelings in mode terms on a cognitive level. Secondly, modes can be retrieved by means of experiential exercises in which patients are guided back to the past. While these two methods can merely be applied in therapy, the third method includes self-report by means of questionnaires, which is also suitable for research purposes. In practice, it is advisable to combine these three assessment methods. Until now, there are two instruments available for assessing modes; the Young Atkinson Mode Inventory (YAMI, Young, Atkinson, Arntz, Engels, & Weishaar, 2005) and the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael, Weishaar et al., 2007). The YAMI assesses the presence of the ten central modes as proposed by Young on frequency by means of 187 items. The SMI measures 14 schema modes (marked with an

asterix in the mode overview, see appendix) by means of 124 items that have to be scored on a 6-point Likert scale measuring frequency and ranging from `never or hardly ever` to `always`. All items of the YAMI are imbedded in the SMI, and additional items of the SMI are based on the Schema Mode Questionnaire (Klokman, Arntz, & Sieswerda, 2001), on suggestions by Beck et al. (2004), Young et al. (2003) and clinical observations. The fact that the SMI assesses 14 schema modes has the incremental quality of providing information on all disorder specific modes, and increases its clinical relevance. Currently, the psychometric properties of the Dutch version of the SMI-r are being studied by Lobbestael, van Vreeswijk, Arntz and Spinhoven (2007) in a large population of both clinical and non-clinical participants. Preliminary data of this study provides support for the 14-factor structure of the SMI by means of confirmatory factor analyses. Furthermore, all subscales possessed good to very good internal reliabilities and test-retest reliabilities of all subscales.

SCHEMA MODE THERAPY

The mode model provides a valuable therapeutic framework for the understanding of personality pathology. This is especially the case because by means of modes, the variety of complaints and dysfunctional beliefs displayed by patients with complex PDs can be clustered together which makes it easier to understand them and work therapeutically with, and because the switching between the modes provides a valuable explanation for the rapid changes in cognitive-emotional-behavioural states seen in these patients. The goal of therapy is to strengthen the healthy sides of patients, and weaken the strength and impact of the maladaptive modes. Therapists help patients to flip from dysfunctional to healthy modes. Schema Focused Therapy and schema mode therapy do not reflect two separate therapies, rather mode work is seen as an advanced component of schema work, which can be used whenever the therapists feels working with schemas alone is inadequate (Bamber, 2004).

Schema-Focused Therapy blends various forms of psychotherapy like Cognitive Behavioural Therapy, Gestalt and Interpersonal therapy. When maladaptive modes are less prominent and healthy modes are in control most of the time, cognitive and behavioural techniques like more-dimensional evaluations, pie charts, schema and mode diaries, positive logbooks, flashcards, role plays and behavioural experiments can well be used. However, when maladaptive modes become more prominent, experiental techniques like (historical) role-play and imagination (see for example Arntz & Weertman, 1999; van Genderen & Arntz, 2005; Young et al., 2003) are indicated. Art techniques can also be added and can give patients the opportunity to express what they are not able to say in words, or help them to get a grip on images of safety for example by hanging drawings of a save haven in their house (see also Haeyen, 2006). Lately, experimental techniques as used in mindfulness based cognitive therapy for depression (Segal, Williams, & Teasdale, 2002) have also been adapted and enhanced to be used in SFT (van Vreeswijk, Broersen, & Schurink, 2006). Mindfulness techniques can make patients become aware of these modes triggering in which they automatically respond to a situation or emotion. Patients learn to view emotions, schema's

and modes as (dark) clouds that come and go and which they have to accept in order to gain control. Hereby the emotional affect tone becomes less severe, different coping styles can come to mind and the opportunity to make a thoughtful decision and adequate healthy responses, becomes easier to do.

Francine is a 26-year-old woman who is having dysthymia, social anxiety disorder and an avoidant PD. One day she did not do her therapy homework and as she comes into the therapy room she immediately says sorry to the therapist. At one moment when patient and therapist are exploring this response of the Compliant Surrender and its function to avoid confrontation, Francine makes a harsh remark to herself for failing to do her homework. She then switches into the Detached Protector, looking away of the therapist and not responding to his question. When the therapist asks Francine if she can come up with a memory of her childhood where she felt the same way as she feels now, the patient makes contact again by coming up with a memory in which her mother is yelling at her for not doing well enough at school. The therapist asks Francine to think of that situation and to introduce the Healthy Adult of Francine in that memory, who is listening to what little Francine needs and to speak up for her against her mother. While hesitating at the beginning, there is some relieve at the end when Francine reflects on the exercise. For the fist time in her life she has come up for herself not accepting the punitive voice of her parent. This fragment describes an imagery rescripting exercise.

CRITICAL EVALUATION OF MODES AND RECOMMENDATIONS FOR FURTHER STUDIES.

A first critical point with respect to schema modes, is when looking at the large number of modes that are and that will be identified, the question arises what the ultimate goal of mode conceptualisation should be. Is this to describe the specific modes of all PDs in all their nuances, or to provide a limited set of basic modes that can be used to understand PDs in more general terms. Clearly, the first option holds the risk of forming a never-ending list of modes. Therefore, perhaps it is sufficient to determine a set of modes that are most prevalent for the most severe PDs, but experience so far indicates that clinicians and researchers will continue to `invite` more modes because they feel these modes are required to understand specific types of personalities.

A recent study by Lobbestael, van Vreeswijk and Arntz (2007) assessed which modes characterize the different PDs by means of path analyses and found BPD to be associated with 9 schema modes. Although these comprised all modes that were a priori hypothesized to be central to BPD, several additional modes appeared to characterize BPD as well. This high number of modes central to BPD is quite surprising given the fact that the mode concept was developed because especially borderline patients recognized so many schemas that it was difficult to pinpoint specific therapy goals. Thus, modes were developed to provide a more comprehensive clustering of these schemas and coping methods, narrowing down the number of them. Since it appears borderline patients are also characterized by so many modes, the question arises whether the mode concept indeed simplifies the cognitive conceptualization of borderline patients.

A third critical point concerns the fact that modes are comprised out of three levels: cognitions, emotions and behaviours. Mode theory presumes that these three levels are so consistent with each other that they change synchronically. So when a person flips to another schema mode, this causes equal activation of that mode's cognitions, emotions and behaviours. This assumption however, has never been empirically tested. Research targeting e.g., anger reactivity, has demonstrated that changes in different anger-related domains are not synchronically. A study by Lobbestael, Arntz, and Wiers (2008) for example, demonstrated low correlations between self-reported emotions and physiological indices. If discrepancies like these already occur in a single emotion like anger, there is a possibility that this will also be the case for complex constructs like schema modes.

The paucity of experimental studies on this topic illustrates research on schema modes is still in its infancy. Clearly, further studies are warranted. In the first place, to underpin existing mode conceptualisations of borderline, antisocial and narcissistic PDs. Secondly, explorative research in other personality disordered groups are necessary in order to provide insight on modes characterizing these disorders, and to assist in the development and conceptualisation of new submodes that are specific for these disorders. Thirdly, there is a need for hard measures on schema modes, providing insight as to how modes are associated with displayed behaviour and emotional responses. Mood inductions are the techniques par excellence to answer this validity research question. Finally, in light of therapeutic effectiveness, there is a need for replication of large-scale studies as that by Giesen-Bloo et al. (2006), and implementation studies of SFT (as currently performed by Nadort, 2006). Also, research into therapy effectiveness of SFT for other PDs besides borderline (currently conducted by Bamelis & Arntz, 2006, for the paranoid, histrionic, narcissistic, dependent, avoidant and obsessive-compulsive PDs) and for SFT group therapy (see van Vreeswijk & Broersen, 2006, for protocol) is warranted.

Chapter 3

Reliability and validity of the Schema Mode Inventory (SMI)

Lobbestael, J., van Vreeswijk, M., Spinhoven, P. & Arntz, A. Reliability and validity of the Schema Mode Inventory (SMI). *Submitted for publication.*

ABSTRACT

Central to the latest form of Schema-Focused Therapy (SFT) is the concept of schema mode. Schema modes are the momentary emotional, behavioural and cognitive state a person can find him/herself in. Despite the increasing popularity of SFT, tests of schema modes are scant. In this study, a new measure was developed to assess modes: the Schema Mode Inventory (SMI). Because the SMI consisted of 270 items, a short version of the SMI was developed containing 124 items. This article examines the factor structure, reliability and validity of this short SMI in a sample of N=863 non-patients, axis I and axis II patients. Structural Equation Modelling supported the 14-factor structure of the short SMI. Internal reliabilities of the subscales were good to excellent. Some modes showed a strong correlation with specific Early Maladaptive Schemas. Test-retest reliability was excellent. The strength of the modes increased monotonically from non-patients to axis I to axis II patients. Some modes were predicted by a combination of the severity of axis I and II disorders, while other modes were mainly predicted by axis II pathology. The convergent and divergent validity of the short SMI subscales was supported.

INTRODUCTION

The last few years, Schema-Focused Therapy (SFT) has become increasingly popular which is reflected in its implementation in many clinical and forensic institutes. A large Dutch outcome study comparing SFT with Transference Focused Psychotherapy (TFP) on changes in borderline criteria, quality of life, and cost-effectiveness demonstrated that SFT was superior to TFP. In addition, the dropout was significantly lower in the SFT condition (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006). Despite the growing interest in SFT, empirical tests of central SFT concepts lag behind.

The three central concepts in SFT are Early Maladaptive Schemas (EMSs), coping responses and schema modes. EMSs are stable, pervasive cognitive patterns regarding the world, oneself and one's relationships with others developed early in life as a result of disadvantageous childhood experiences. Coping responses reflect the ways in which people can deal with their maladaptive schemas; overcompensation (fight the schema as though the opposite were true), avoidance (avoid the schema to be activated) and surrender (give into the schema, Young, Klosko & Weishaar, 2003). The EMS model reflects primarily trait constructs, but does not tell about the patient's current state. Therefore, Young has postulated the presence of so-called *schema modes* that represent the moment-to-moment emotional and cognitive state and coping responses that are active at a given point in time. Schema modes can be triggered by emotional events and an individual may shift from one schema mode into another. This way, the schema mode concept provides a valuable model for explaining the rapid shifting in emotion and behaviour demonstrated by patients suffering from severe personality disorders (PDs). According to SFT, PDs are characterized by specific sets of modes. Young identified 10 general schema modes, that can be grouped into four broad categories. First, child modes that are related to basic needs of children. Second, dysfunctional coping modes that are related to the three coping styles of overcompensation, avoidance and surrender. Third,

dysfunctional parent modes that reflect internalized behavior of the parents towards the patient as a child. Finally, the Healthy Adult mode which includes functional cognitions, thoughts and behaviours (Young et al., 2003). Although Young originally proposed 10 schema modes, additional modes have been put forward that form subgroups of these 10 modes to better describe specific PDs (Arntz & Bögels, 2000; Young et al., 2003).

Questionnaires assessing EMSs have been subject of several empirical studies including the validation of the Young Schema Questionnaire (Lee, Taylor & Dunn, 1999; Rijkeboer, van den Bergh, Arntz, Gijs & van den Bout, 2004; Rijkeboer, van den Bergh & van den Bout, 2004; Rijkeboer, van den Bergh & Arntz, 2004; Schmidt, Joiner & Telch, 1995), and the determination of associations between EMSs and specific PDs (e.g., Ball & Cecero, 2001; Jovev & Jackson, 2004; Schmidt et al., 1995). In contrast, there are only two studies available concerning schema mode measurement and conceptualization. Both Arntz et al. (2005) and Lobbestael et al. (2005) found borderline PD to be characterized by the Detached Protector, Punitive Parent, Abandoned and Abused Child and Angry Child modes, as predicted by Young. Cluster C PDs were characterized by a relatively high Overcompensation mode. The antisocial PD group displayed the same modes as the borderline PD group, but their presence was less strong. Remarkably, antisocial patients reported high levels of the Healthy Adult mode, which probably reflects antisocial patients` tendency to fake (super) normality and to under report negative issues (Lobbestael et al., 2005; Cima, Merckelbach, Hollnack, Butt, Kremer et al., 2003).

A first step in adequate mode assessment is the development and validation of a mode questionnaire. The mode questionnaires investigated so far only covered a limited set of modes. Therefore, our group recently developed the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael, Weishaar, van Vreeswijk & Klokman, 2007), a self-report questionnaire that purports to measure the presence of 16 schema modes. This SMI is based on three precursors (1) the Schema Mode Questionnaire (Arntz et al., 2005), (2) the Young Atkinson Mode Inventory (YAMI, Young, Atkinson, Arntz, Engels and Weishaar, 2005), and (3) extra items based on suggestions by Beck, Freeman and Davis (2004) and Young et al. (2003) and clinical observations. The SMI allows a more refined assessment of schema modes as compared to the YAMI that only measures the presence of 10 basic modes. This elaboration allows the assessment of modes that are central in specific PDs. For example, the YAMI does not measure the presence of the Self Aggrandizer and Lonely Child modes, while Young postulates that these modes are central to narcissistic PD. The 16 schema modes of the SMI are presented in the appendix. In this overview, all modes are clustered into one of the four broad categories, as well as thematically subdivided.

Earlier investigation of the Schema Mode Questionnaire demonstrated good internal reliability values (mean Cronbach`s $\alpha = .90$, Arntz et al., 2005; Lobbestael et al., 2005). Until now, the YAMI has not been tested empirically. So far, no research has been done on the psychometric properties of the newly developed SMI. Therefore, the aim of the present study is to provide reliability and validity data on the SMI in order to evaluate whether this questionnaire can serve diagnostic practice in a meaningful way. Confirmative factor analyses were performed in order to test the proposed 16-factor structure of the SMI.

In addition, internal reliability of the different subscales was estimated and inter-correlations between the scales were assessed. Next, a short version of the SMI was constructed. This was done in order to increase feasibility in administering the SMI. Again, factor structure of this short version was tested, as well as internal reliability of the subscales and correlations between the subscales. This short SMI was used for the next research questions of this study. The schema mode model is specifically developed to assess PDs. Therefore, it is of interest to investigate the strength of modes as measured with the short SMI in a population that has a PD, compared to a population with only axis I diagnoses and to a non-clinical population. It was expected that there would be a monotonically increasing presence of modes from non-patient controls to axis I patients to axis II patients. In addition, the correlations between EMSs (as measured with the Young Schema Questionnaire) and modes were assessed to give further insight into the relationship between these two concepts. To validate further the inventory, for each of the short SMI scales, (subscales of) questionnaires were administered that were theoretically supposed to correlate positively or negatively with the mode in question. This way, concurrent validity (composed of convergent and divergent validity) was estimated. Finally, because schema modes are hypothesised to be consistent over time (Young et al., 2003), test-retest reliability was estimated over a period of 4 weeks.

Because the aim of this study was to assess the general presence of modes, and in order to avoid momentary influences, this study used the trait version of the SMI (that requires item frequency rating in general), as opposed to the YAMI that requires item rating at the present moment.

In sum, this study addressed the psychometric properties of a new schema mode questionnaire. This is an essential step in testing the mode concept, one of the main features of SFT. In addition, the assessment of schema modes has important clinical relevance because once identified, these modes can be targeted with psychotherapeutic interventions to correct them, so that symptomatology will be reduced (Young et al., 2003).

METHOD

Participants

Data were analyzed from 863 participants, of which 319 non-patient controls without psychopathology, 136 patients with axis I disorders and 236 patients with axis II disorders. Thirty-seven participants were patients who did not fully fulfil any of the axis I or II diagnoses, and 16 participants were screened as nonclinical participants, but met criteria on axis I or II, without fulfilling the complete diagnostic criteria for a specific disorder. Because comorbidity between PDs is the rule, multiple PDs were allowed. There were no SCIDs available for 119 non-patients. Patients were recruited from several outpatient, inpatient and forensic mental health-care institutes within the Netherlands and Belgium. Non-patient controls were recruited by means of advertisement. General exclusion criteria were age < 18 and > 70 years, intoxication by alcohol or drugs during testing, IQ below 80, and not being a native speaker of Dutch. All participants signed informed consent.

Of the 863 participants, 42.9% were male, and 57.1% female. Mean age of the sample was 34 years (SD= 11.80), ranging from 18 to 70 years. Ninety-six percent of the participants were of Dutch nationality, 2.8% Belgium, and 0.9% had another nationality. With respect to educational level, 0.9% received no education, 6% attended primary school and 34.3% high school or low-level vocational studies, while 27% completed a secondary education and 31.7% a higher education. Thirty-nine percent of the participants were married or lived together, while 60.8% was single. Of all patients, 58.5% was recruited from outpatient settings, 29.4% from inpatient settings and 12.1% from a forensic institute. The patients of the clinics and prisons were contacted to participate in this study by their therapists who were informed about the in- and exclusion criteria of the patients targeted for this study. The therapists provided general verbal information and an information letter of this study to these patients and if the patients indicated that they were willing to participate, they were contacted by the experimenter. Non-patient controls were recruited by means of advertisement in local papers.

Materials

Schema Mode Inventory, long version (SMI, Lobbestael, van Vreeswijk, Arntz, Spinhoven, & 't Hoen, 2005)

Items of the YAMI were translated into Dutch according to standard procedures (Van de Vijver & Hambleton, 1996). A total of 270 items had to be scored on frequency using a 6-point Likert scale ranging from `never or hardly ever` to `always`. An overall score was calculated from the scale sum score divided by the number of items in that scale. The higher the score, the more frequent manifestations of the mode were. Items of the SMI reflected emotions, cognitions and behaviours. The number of items per scale ranges from 10 to 31. In order to reduce bias in the factor analyses and to minimize response tendencies, items of the SMI were randomized. Administration time of the SMI was about 40 minutes.

Screening instruments

Dutch versions of the Structural Clinical Interview for DSM-IV axis I and axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon, Williams & Benjamin, 1994; First, Spitzer, Gibbon & Williams, 1997; van Groenestijn, Akkerhuis, Kupka, Schneider & Nolen, 1999; Weertman, Arntz & Kerkhofs, 2000) were used to assess DSM-IV axis I diagnoses and personality pathology. In a test-retest study, satisfactory inter-rater reliabilities were found for SCID II (median Intra-Class Correlation, ICC, for trait scores of seven PDs = 0.66; Weertman, Arntz, Dreessen, van Velzen & Vertommen, 2003). Inter-rater reliability coefficients of the SCID II ranged from .48 to .98 for categorical diagnoses (Cohens`s κ), and from .90 to .98 for dimensional judgements (ICC), while internal consistency coefficients of the trait scales were satisfactory (.71-.94, Maffei, Fossati, Agostoni, Barraco, Bagnato et al., 1997). Interviewers were extensively trained and supervised by the first author. Ninety-seven interviews were rated twice (by means of audio taping the original interview), and yielded high inter-rater reliabilities values (ICC between .76 and .98, with a mean of .92). In some cases (depending on the screening procedures within the clinics) the Structural Interview for DSM-IV Personality Disorders (SIDP-IV, Pfohl, Blum & Zimmerman, 1995, Dutch version: Jong, Derks, van Oel & Rinne, 1997)

was used to assess axis II pathology. This semi-structured interview is organized by topic sections rather than disorders (as in the SCID-II). Psychometric research in a Dutch opioid-dependent patient sample of the SIDP-IV demonstrated excellent reliability at criterion level (Cohen`s Kappa ranging from .76 to .93 and ICC ranging from .67 to .97), as well as on a diagnostic level (Cohen`s Kappa ranging from .66 to 1.00, and ICC ranging from .88 to .99, Damen, Van der Kroft & De Jong, 2004). Research assessing the agreement between SCID II and SIDP-IV demonstrated good convergence between the two interviews (Saylor, 2003), indicating both interviews can be used within one study for screening purposes.

Questionnaires for construct validity

Young Schema-Questionnaire, Short version. For this study, the Dutch short version of the Young Schema-Questionnaire (Sterk & Rijkeboer, 1997; Young, 1998) was administered. The YSQ-SV was developed to measure the presence of 15 EMSs: Emotional Deprivation, Abandonment, Mistrust/Abuse, Social Isolation, Defectiveness/Shame, Failure to Achieve, Dependence/Incompetence, Vulnerability to Harm, Enmeshment, Subjugation, Self-Sacrifice, Emotional Inhibition, Unrelenting Standards, Entitlement, and Insufficient Self-Control. This inventory consists of 75 items, which are rated on a 6-point Likert scoring format ranging from `completely untrue` to `describes me perfectly`. An overall score was calculated from the scale sum divided by the number of items of that scale. All schema subscales demonstrated to have adequate to high internal consistencies (Cronbach α ranging from .76 to .95), adequate to high stability coefficients (range rV: .68 to .87), good classification ability between subjects (88% correctly classified) and good convergent validity (Rijkeboer et al., 2004; Rijkeboer, van den Bergh & van den Bout, 2004; Rijkeboer et al., 2005; Rijkeboer et al., 2004). Some EMSs and mode concepts resemble highly due to shared themes and developmental issues. Therefore, correlations were expected between all EMSs and maladaptive schema modes. Next to this, prominent correlations were hypothesized between the scales of Emotional Deprivation, Abandonment and Mistrust/Abuse Defectiveness/Shame and the Vulnerable Child mode; Insufficient Self-Control with Impulsive and Undisciplined Child; Functional Dependence, Subjugation and Self-Sacrifice with Compliant Surrender; Social Isolation with Detached Protector; Entitlement with Self Aggrandizer; and Unrelenting Standards with Demanding Parent mode. A negative correlation is expected between Emotional Inhibition and the Happy Child mode.

Temperament and Character Inventory. The Dutch translation of the Temperament and Character Inventory (TCI) was used (Cloninger, Przybeck, Svrakic & Wetzel, 1994; Duijsens & Spinhoven, 2000). The TCI is a test designed to identify the relationships and intensity of the seven basic personality dimensions based on Cloninger`s psychobiological theory of personality. The TCI assesses temperament dimensions (Novelty Seeking, Harm Avoidance, Reward Dependence and Persistence) and three characteristic dimension (Self-Directedness, Cooperativeness and Self-Transcendence). The 7 TCI subscales comprise 25 facets, of which the following facets were used in the present study: impulsiveness, regimentation, uninhibited optimism, detachment, dependence, independence, persistence, inpersistence, purposeless, slowness, self-acceptance, revengefulness and pure-heartedness. The 96 items had to be answered in a right-wrong format. Research in Dutch samples demonstrated that the TCI subscales had low to good

internal consistencies, with Cronbach α ranging from .62 to .90 with an average of .78 and good test-retest values (between .77 and .90, Duijsens & Spinhoven, 2000; Duijsens, Spinhoven, Goekoop, Spermon & Eurelings-Bontekoe, 2000). Positive correlations were hypothesized to be found between the TCI revengefulness scale and the Angry Child and the Bully and Attack modes; TCI impulsiveness and Impulsive Child; TCI inpersistence and purposeless with Undisciplined Child; TCI uninhibited optimism with Happy Child; TCI detachment with Detached Protector; TCI persistence with Demanding Parent, and TCI self-acceptance and uninhibited optimism with the Healthy Adult mode. A negative correlation was expected between TCI independence and the Compliant Surrender mode.

Irrational Belief Inventory. The Irrational Belief Inventory (IBI, Timmerman, Sanderman, Koopmans & Emmelkamp, 1993) measures the presence of five dimensions underlying the irrational beliefs as formulated by Ellis (1962), viz. Worrying, Rigidity, Problem Avoidance, Demand for Approval and Emotional Irresponsibility. In this study, only the items of the Rigidity scale that measured high moral values were included (Cronbach α in the current sample = .78). This lead to a total of 14 items that had to be scored on a 5-point Likert scale, ranging from `strongly agree` to `strongly disagree`. Research indicated that the Rigidity scale is highly reliable (α = .85) and has good validity (Koopmans, Sanderman, Timmerman & Emmelkamp, 1994). The sum of the rigidity items was hypothesized to correlate with the Punitive Parent mode.

State-Trait Anger Scale. The `Zelf Analyse Vragenlijst` (van de Ploeg, Defares & Spielberger, 1982) is the Dutch adaptation of the State-Trait Anger Scale (STAS, Spielberger, Jacobs, Russel & Crane, 1983) by which two anger concepts can be measured: trait anger that is viewed as the relatively stable tendency to experience anger, and state anger which is the current level and therefore passing emotional condition of anger. Each scale has ten items with four response categories, ranging from `almost never` to `almost always`. The scale validity was good to excellent for the trait anger (varied between .88 and .94; mean = .91), and good for the state scale (between .75 and .88; mean = .81). Test-retest reliability for trait anger was high (α = .78, van de Ploeg et al., 1982). Because the SMI is trait-defined, trait anger was hypothesized to correlate positively with the Angry and Enraged Child, and the Bully and Attack modes.

Personality Disorder Belief Questionnaire. The Personality Disorder Belief Questionnaire (PDBQ, Dreessen & Arntz, 1995) was used to assess the strength of beliefs assumed to be specific to various PDs. For this study, the Narcissism scale was included which consist of 20 assumptions that had to be rated by placing a vertical mark on 100 mm Visual Analogue Scales (VAS), which anchors `I don`t belief this at all` and `I believe this completely`. Ratings were expressed in millimeter, a higher score indicating a stronger belief in narcissism associated assumptions (Arntz, Dietzel & Dreessen, 1999; Arntz, Dreessen, Schouten & Weertman, 2004). No previous study assessed the PDBQ Narcissism scale but internal consistency of the Narcissistic scale of the Personality Belief Questionnaire (which resembles the PDBQ very much) proved to be good (α = .85, Butler, Brown, Beck & Grisham, 2002). Furthermore, Cronbach α of this subscale was .93 in the current sample. The narcissism scale of the PDBQ was expected to show a positive correlation with the Self Aggrandizer mode.

Loneliness Scale. The Loneliness Scale (LS, de Jong Gierveld & van Tilburg, 1999) is based on a cognitive theoretical definition of loneliness, which emphasizes the discrepancy between what one wants in terms of interpersonal affection and intimacy, and what one has; the greater the discrepancy, the greater the loneliness. In this way, loneliness is seen as a subjective experience that is not directly related to situational factors (de Jong Gierveld & van Tilburg, 1999). There are two subscales, the social loneliness scale and the emotional loneliness scale, which summed up form the total loneliness score. The LS is a 11-item questionnaire that had to be scored on a 5-point scale ranging from `yes!` to `no!`. Scale reliability was between .80 and .90 (Chronbach`s $\alpha$ or rho), the scale homogeneity with Loevingers` *H* varied in the .30 to .50 range (de Jong Gierveld & van Tilburg, 1999). The LS was expected to show a positive correlation with the Vulnerable Child mode.

Relationship Scales Questionnaire. The Relationship Scales Questionnaire (RSQ, Griffin & Bartholomew, 1994) contains 30 short statements drawn from the attachment patterns as defined by Bartholomew (1990); Security, Fearfulness, Preoccupiedness, and Dismissingness. On a 5-point scale, ranging from `not at all like me` to `very much like me`, participants rated the extent to which each statement best described their characteristic style in close relationships. Only the four items reflective of the Fearfulness attachment pattern were administered in this study. In the present sample, internal consistency of this scale was α = .77. Fearful attachment was hypothesized to correlate positively with the Vulnerable Child mode and the Detached Protector mode.

Utrecht Coping List. The Dutch questionnaire Utrecht Coping List (UCL, Schreurs, van de Willige & Brosschot, 1993) measures coping behavior people demonstrate in confrontation with aggravating life events. This list is divided into 7 subscales: Confrontation, Palliative reaction pattern, Avoidance, Seeking of social support, Depressive reaction pattern, Expression of emotions, and Optimism. For this study, only the Palliative reaction pattern was included, which refers to distraction seeking to not have to think about the problem. The 8 items had to be scored on a 4-point Likert scale from `seldom or never` to `very often`. The palliative scale has a reasonable reliability (Cronbach α`s vary from .64 to .76, mean = .69, test-retest vary from .52 to .69, mean = .57, Schreurs et al., 1993). Palliative reaction was expected to correlate with the Detached Self-Soother mode.

Childhood Trauma Questionnaire. The Childhood Trauma Questionnaire was translated in Dutch by Arntz and Wessel (1996). The Short Form (28 items) consisted of 5 clinical scales: physical, emotional and sexual abuse, and physical and emotional neglect, represented by 5 items each, and a 3-item minimization/ denial scale to detect maltreatment under-reporting. Each item began with the phrase ``When I was growing up ...``, and had to be scored on a 5-point Likert scale according to the frequency by which the described event occurred. Response options ranged from `never true` to `very often true`. Studies have demonstrated the measurement invariance of the CTQ across 4 clinical and community samples, and confirmed the 5-factor structure. All 5 scales showed adequate to good reliability (mean α ranging from .69 to .94), and the reliability for the entire measure was .91. Self-report responses on the CTQ scales are

highly stable over time and show good convergent and divergent validity with trauma histories that have been ascertained by other measures (Bernstein et al., 2003; Scher, Stein, Asmundson, McCreary & Forde, 2001). A positive relationship between the CTQ and the Vulnerable Child mode was expected.

Procedure

All participants were tested individually. Approximately half of the participants filled out the paper-and-pencil versions of the questionnaires, while the other participants filled out the questionnaires electronically. Data collection was completed in two sessions of one hour each; in the first session, participants were informed about the goal of the study and filled out the SMI, the other questionnaires were administered in the second appointment. All participants signed informed consent and received a financial compensation of 5 euros. The study was approved by the Medical Ethical Committee of the Academic Hospital of Maastricht.

Statistical analyses

First, the long version of the SMI (270 items) was psychometrically assessed. The factor structure of this SMI was tested by means of Confirmatory Factor Analyses (CFA), employing Structural Equations Modelling (SEM, LISREL software 8.54, Jöreskog & Sörbom, 2001). The fits of four models were tested; (1) the original scaling of the SMI with 16 subscales. This is the most differentiated model, (2) a semi-differentiated model in which all of the 16 scales that correlate highly were clustered, (3) an 8-factor model in which the modes were clustered thematically (see the appendix). This semi-parsimonious model consisted of three childhood themes: vulnerability (Lonely Child and Abandoned and Abused Child), anger (Angry and Enraged Child), and lack of discipline (Impulsive and Undisciplined Child); three maladaptive coping themes: surrender (Compliant Surrender), avoidance (Detached Protector and Detached Self-Soother) and overcompensation (Self-Aggrandizer, Over Controller and Bully and Attack mode); one maladaptive parent theme (Punitive and Demanding Parent) and one healthy theme (Happy Child and Healthy Adult), (4) in the last model, all subscales were grouped into one of the 4 broad categories: dysfunctional child modes, dysfunctional parent modes, dysfunctional coping modes and healthy modes. Because the Happy Child mode differs markedly from the other child modes in that it is the only non-pathological mode, in this 4-factor model the Happy Child was combined with the Healthy Adult mode into one adaptive factor. This is the most parsimonious model. Missing data were estimated by means of missing value analyses. The goodness-of-fit was evaluated using the comparative fit index (CFI), the Standardized Root Mean Square Residual (SRMR), the χ^2-test and the degrees of freedom. A CFI value above .90 and an SRMR value below .08 are considered indicative of a good fit.

Internal reliability of the long version` SMI subscales was assessed by calculating Cronbach`s α: values above .90 were interpreted as excellent, >.80 as good, and >.70 as adequate. Correlations between the factors were calculated by means of Pearson correlations corrected for attenuation.

Next, a short version of the SMI was selected out of the 270-item SMI. This was done by means of Multiple Group Method (MGM, Holzinger, 1944). In this method scores on the subscales were determined as sums of the scores on those items that were hypothesized to belong to that specific subscale. The correlation between each item and each subscale was determined by means of Pearson Correlations. These calculations were corrected for the fact that each item itself belonged to a certain subscale, by replacing that Pearson Correlation by the item-rest correlation of that item for the scale it was hypothesized to belong to. If an item correlated strongest with the subscale to which it was assigned a priori, that item fitted well with that scale. If an item correlated higher with a scale it was not a priori assigned to, that item was allocated to the wrong scale, and should have been part of the scale it correlates highest with. It was aimed that each subscale of the short SMI would consist of 10 items. For this purpose, those 10 items were chosen that correlated the strongest with their a priori hypothesized scale and that loaded at least .10 higher on their hypothesizes scales than on the non-hypothesized scales. All further analyses (ANOVA trend analyses, concurrent validity and test-retest reliability) were performed using this short SMI version. This short SMI was translated in English according to standard procedures (Geisinger, 1994; Van de Vijver & Hambleton, 1996). Two independent bi-lingual professionals who were also experts in the field of schema therapy conducted the translation. The quality of the translation was carefully reviewed by a small group of experts in the field. The English language translation is available for investigators and therapists with the first author of this article.

ANOVA trend analyses were used to test the hypothesis that scores on the subscales of the short SMI would monotonically increase from non-patient controls, to patients with axis I disorders, to patients with PDs. Linear and quadratic effects were evaluated. In addition, stepwise regression analyses were performed for each mode (defined as the dependent variable) with the number of axis I disorders as predictor in step 1 and the strength of axis II disorders (calculated by adding all scores of all PD criteria) as predictor in step 2. This way, it could be assessed whether the modes were predicted by the number of axis I disorders and/or the severity of axis II disorders. Furthermore, this way it could be evaluated whether the severity of axis II disorders had an additional value over and above the number of axis I disorders in explaining the scores on the short SMI modes. These stepwise linear regression analyses were also performed with the severity of axis II disorders as the predictor in step 1, and the number of axis I disorders as the predictor in step 2, to assess the incremental value of axis I pathology above axis II pathology in explaining mode scores.

Concurrent validity was assessed by means of Pearson correlations between the short SMI subscales and the YSQ and other construct questionnaires. Pearson values of .70 or more were considered to be indicative of good convergent validity, while values of .30 or lower reflect good divergent validity. Test-retest reliability over a 4-week period was calculated in a healthy sample using the intra-class correlation coefficient (ICC) and 95% confidence intervals.

RESULTS

Descriptive statistics

Of the 744 participants from whom axis I and II diagnoses were assessed with SCID I and SCID II, 12.4% suffered from a borderline PD, 8.1 % from an avoidant PD, 6.3% from a depressive PD, 4.9% from an antisocial PD, 4.6% from an obsessive-compulsive PD, and 3.5% from a paranoid PD. Other PDs occurred in 3% or less of the cases. With respect to axis I diagnoses, 25.5% had an anxiety disorder, 19.8% a mood disorder, 14.3% substance abuse, 7.9% an eating disorder, and 4.6% a somatoform disorder.

Factor structure of the long SMI

Inspection of the attenuation-corrected correlations between the 16 factors revealed several correlations above .90. Three of those strong correlations reflected pairs that are highly similar according to SFT: the Abandoned and Abused Child and Lonely Child, Impulsive and Undisciplined Child, and Happy Child and Healthy Adult modes. Therefore, in the semi-differentiated model these 3 pairs were coupled, leading to a 13-factor model.

Table 1 provides the goodness-of-fit indices for the four models. For the most- and semi-differentiated models and the parsimonious model, the CFI was well above .90, and SRMR values were .08, indicating excellent fits. The SRMR score of the semi-parsimonious model was .09 and thus too high. However, the difference between the Chi-squares of the four models were significant ($p < .001$ for all models), indicating that the 16-factor model provided a better fit than the 13-, 8- and 4-factor solutions. These data indicate the most differentiated model is preferable above any clustering of the 16 modes.

Table 1: Goodness-of-fit indices of the long SMI (270 items).

Model	Number of factors	CFI	SRMR	χ^2 (df)
Most differentiated	16	.98	.08	96543.06 (35124)*
Semi-differentiated	13	.98	.08	97299.03 (35166)
Semi-parsimonious	8	.98	.09	102110.43 (35216)
Parsimonious	4	.97	.08	113936.32 (35238)

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-square; df = degrees of freedom; * this model is significantly better than the other models at the $p<.001$ level.

Internal reliability, item loadings and correlations between subscales of the long SMI

The internal reliabilities of the subscales of the SMI were adequate (lowest $\alpha = .78$) to excellent (highest $\alpha = .96$). The mean Cronbach's α of all SMI subscales was excellent ($\alpha = .90$). All item loadings were adequate (item loadings above .40), except for 25 items. Item loadings varied between .48 and .81, with a mean of .62.

Inter-correlations between the SMI factors, corrected for attenuation, ranged from -.89 to .99. Despite some very high correlations, none of the confidence intervals (± 2 * SE; Anderson & Gerbing, 1988) around the correlation estimates between two subscales included 1.0, suggesting that the SMI subscales do represent distinct constructs.

Construction of the short SMI

By means of MGM analyses exactly 10 items were selected for 7 SMI subscales that loaded uniquely on their a priori hypothesized scale; Angry Child, Enraged Child, Happy Child, Self-Aggrandizer, Punishing Parent, Demanding Parent and Healthy Adult mode. For 7 other subscales, only 4 to 9 items appeared to load uniquely on their subscales; Impulsive Child (9 items), Undisciplined Child (6 items), Compliant Surrender (7 items), Detached Protector (9 items), Detached Self-Soother (4 items), Bully and Attack (9 items) and Demanding Parent (9 items). For the subscales of the Abandoned and Abused Child and for the Over Controller, not enough items could be selected that loaded uniquely on these scales. Therefore, because of high theoretical resemblance between the scales of the Lonely Child and that of the Abandoned and Abused Child, these two scales were clustered together constituting the Vulnerable Child mode, which parallels the division Young made in his 10 scale version of the YAMI. Ten items were selected that represented this Vulnerable Child mode in a unique way. The Over Controller subscale was left out of the short SMI version and subsequent analyses. In conclusion, the short version of the SMI consisted out of 14 subscales, and the number of items ranged between 4 and 10 with a mean of 8.9 items per scale. In total, the short SMI contains 124 items. For all further analyses in this study, this short SMI was used. In the appendix, all modes that are included in the short SMI are marked with an asterisk.

Factor structure of the short SMI

Table 2 provides the goodness-of-fit indices for three models: (1) the most differentiated model with 14 subscales, (2) a semi-parsimonious model of 8 thematically clustered subscales, and (3) a parsimonious model consisting of 4 factors (for a more detailed explanation of these last two models see also the statistical analyses section of the long SMI). For all models, the CFI was well above .90. The SRMR was only below .08 for the most differentiated model, which indicates an excellent fit for this model. However, the difference between the Chi-squares of the three models were significant ($p < .001$ for all models), indicating that the 14-factor model provided a better fit than the 8- and 4-factor solutions. These results indicate that the most differentiated model is preferable above any clustering of the 14 modes.

Table 2: Goodness-of-fit indices of the short SMI

Model	Number of factors	CFI	SRMR	χ^2 (df)
Most differentiated	14	.98	.07	21639.02 (7534)*
Semi-parsimonious	8	.97	.08	26589.39 (7597)
Parsimonious	4	.96	.09	35091.30 (7619)

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-square; df = degrees of freedom;
* this model is significantly better than the other models at the p<.001 level.

Internal reliability, item loadings and correlations between subscales of the short SMI

The internal reliabilities of the subscales of the short SMI (see table 3) were adequate (lowest α = .76) to excellent (highest α = .96). The mean Cronbach's α of all short SMI subscales was good (α = .86). All item loadings were adequate (item loadings above .40), except for 7 items. Mean item loadings of all items per subscale varied between .53 and .85, with a mean of .66 (see table 3)

Table 3: Internal reliability of the short SMI subscales

Short SMI subscales	Number of items	Mean inter-item correlation	Range item-rest correlation	Cronbach`s α	Mean item loading
Vulnerable Child	10	.71	.74-.86	.96	.85
Angry child	10	.44	.45-.73	.89	.66
Enraged Child	10	.51	.37-.80	.91	.71
Impulsive Child	9	.43	.32-.76	.87	.66
Undisciplined Child	6	.35	.25-.65	.76	.59
Happy Child	10	.52	.45-.77	.92	.72
Compliant Surrender	7	.39	.39-.64	.82	.53
Detached Protector	9	.53	.62-.76	.91	.73
Detached Self-Soother	4	.46	.51-.68	.80	.70
Self-Aggrandiser	10	.33	.37-.65	.83	.58
Bully and Attack	9	.34	.41-.68	.81	.59
Punitive Parent	10	.51	.53-.76	.91	.72
Demanding Parent	10	.34	.37-.64	.84	.57
Healthy Adult	10	.37	.47-.70	.85	.61
Mean	8.9	.46	.45-.72	.86	.66

The factor inter-correlations between the short SMI subscales are presented in table 4. All maladaptive modes correlated positively with each other, as did the two adaptive modes (Happy Child and Healthy Adult). The adaptive modes correlated negatively to all maladaptive modes. Mean intercorrelation of all positive values was .58, and mean intercorrelation of all negative values was -.48. The mean correlation between all maladaptive child modes was .64, the mean correlation between the coping modes was .55, and the maladaptive parent modes correlated .61 with each other. The two healthy modes correlated .85 with each other. Despite some very high correlations, none of the confidence intervals ($\pm$ 2 * SE; Anderson & Gerbing, 1988) around the correlation estimates between two subscales included 1.0, suggesting that the SMI subscales do represent distinct constructs. These data indicate that the factors of this short SMI were better discriminable than the factors of the long SMI, with highest absolute r = .89.

Table 4: Factor inter-correlations between the short SMI subscales, corrected for attenuation.

	VC	AC	EC	IC	UC	HC	CS	DPt	DSS	SA	BA	PP	DP	HA
VC	1													
AC	.77	1												
EC	.51	.75	1											
IC	.57	.68	.75	1										
UC	.63	.56	.47	.69	1									
HC	-.89	-.74	-.54	-.51	-.55	1								
CS	.71	.51	.22	.35	.54	-.58	1							
DPt	.87	.76	.56	.60	.67	-.84	.70	1						
DSS	.79	.78	.56	.64	.59	-.71	.66	.76	1					
SA	.35	.51	.48	.49	.46	-.28	.29	.43	.51	1				
BA	.36	.66	.67	.58	.48	-.39	.28	.54	.53	.78	1			
PP	.86	.72	.56	.61	.58	-.78	.70	.80	.76	.34	.43	1		
DP	.61	.57	.35	.33	.25	-.49	.66	.59	.71	.63	.43	.61	1	
HA	-.73	-.51	-.41	-.49	-.60	.85	-.56	-.69	-.56	-.13	-.26	-.73	-.24	1

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult.

Scores in the subgroups

Mean scores and standard deviations on all modes are presented in table 5 for the three groups of non-patient controls, axis I and axis II patients, along with the results of the trend analyses. All linear trends were significant (p`s $< .001$) indicating that the scores of all maladaptive modes increased monotonically over these three groups. The scores on the adaptive modes decreased monotonically over the three groups ($p$`s $< .001$). In addition, there was a negative quadratic trend for the Angry Child and the Detached Self-Soother, and a positive quadratic trend for the Happy Child mode. This indicated that in these modes scores, there was a large difference between the nonpatients and axis I patients, and a small difference between axis I and axis II groups.

Table 5: Means, standard deviations and trend analyses of the short SMI subscales in three subsamples

Short SMI subscales	Non-patient controls		Axis I patients		Axis II patients		Linear trend		Quadratic trend	
	m	sd	m	sd	m	sd	t	p	t	p
VC	1.47	.51	2.66	.94	3.36	1.11	19.60	<.001**	-1.51	.13
AC	1.81	.48	2.56	.90	3.09	.94	26.20	<.001**	-3.06	.002*
EC	1.20	.29	1.55	.67	2.05	.92	15.49	<.001**	1.17	.25
IC	2.15	.53	2.46	.72	3.05	.97	14.13	<.001**	1.95	.06
UC	2.27	.60	2.57	.85	2.95	.94	10.34	<.001**	.55	.58
HC	4.52	.54	3.39	.87	2.88	.77	-27.55	<.001**	4.63	<.001**
CS	2.51	.56	3.00	.88	3.32	.95	12.32	<.001**	-1.10	.27
DPt	1.59	.52	2.35	.94	2.95	.94	20.40	<.001**	-1.13	.26
DSS	1.93	.65	3.00	.91	3.32	.98	19.68	<.001**	-4.71	<.001**
SA	2.31	.59	2.47	.76	2.63	.87	5.16	<.001**	-.01	.99
BA	1.72	.51	1.91	.68	2.21	.77	8.85	<.001**	.78	.44
PP	1.47	.39	2.16	.90	2.75	.97	20.09	<.001**	-.81	.42
DP	3.06	.60	3.50	.85	3.71	.90	9.83	<.001**	-1.62	.11
HA	4.60	.56	3.99	.80	3.60	.83	-16.49	<.001**	1.52	.13

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; * significant at p<.05; ** significant at p<.001

Regression analyses indicated that the strength of PDs significantly predicted all modes over and above axis I disorders (see table 6). Regression weights varied from -.33 to .38 with an absolute mean of .31. Changes in explained variance due to axis II pathology above axis I pathology varied between 1.3 and 13.6%, with a mean of 8.1%. The number of axis I disorders predicted 10 out of 14 modes (all but the Enraged, Impulsive and Undisciplined Child, and the Bully and Attack modes) above the severity of axis II disorders. Regression weights varied from -.36 to .34 with an absolute mean of .19. Changes in explained variance due to axis I pathology above axis II pathology varied between .3 and 10.4%, with a mean of 3.5%. In both analyses, a reversed effect was found for the Happy Child and Healthy Adult modes, indicating the more severe the PD and axis I pathology, the less strong these adaptive modes. These results indicate that although both axis I and axis II contributed to the explained variance of most of the modes independently of each other, the effect of axis II pathology on the explained variance of the modes was stronger.

Table 6: Regression analyses of the number of axis I disorders and the severity of axis II disorders on the modes.

Short SMI subscales	ß axis I	ß axis II	R^2 change axis II above axis I		R^2 change axis I above axis II	
			R^2 (%)	p	R^2 (%)	p
VC	.34	.30	7.2	<.001**	9.2	<.001**
AC	.21	.38	11.5	<.001**	3.4	<.001**
EC	.06	.41	13.6	<.001**	.30	.24
IC	.06	.38	11.5	<.001**	.30	.19
UC	.07	.29	6.9	<.001**	.40	.16
HC	-.36	-.33	8.7	<.001**	10.4	<.001**
CS	.18	.17	2.4	.001*	2.5	.001*
DPt	.22	.37	10.7	<.001**	3.8	<.001**
DSS	.23	.29	6.6	<.001**	4.0	<.001**
SA	-.18	.33	8.6	<.001**	2.5	<.001**
BA	-.09	.39	12.2	<.001**	.60	.07
PP	.25	.30	7.2	<.001**	5.1	<.001**
DP	.11	.13	1.3	.02*	1.0	.03*
HA	-.27	-.24	4.7	<.001**	5.9	<.001**

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; * significant at p<.05; ** significant at p<.001.

Correlations between EMSs and schema modes

Regarding the correlations between EMSs and schema modes (see table 7), 15 out of 210 correlations were higher than .70. Furthermore, 7 out of 12 predicted associations were higher than .70, and other predicted associations were not markedly lower than .70. Most of these high correlations (above .70) were found with the Vulnerable Child (6), followed by the Detached Protector (3), the Angry Child and the Punishing Parent (each 2), and finally the Undisciplined Child mode (1). No high correlations were found for the 8 other modes indicating that these scales do not show high overlap with the EMS concept.

Table 7: Pearson correlations between short SMI and YSQ subscales.

YSQ subscales	VC	AC	EC	IC	UC	HC	CS	DPt	DSS	SA	BA	PP	DP	HA
Emotional deprivation	.71	.62	.40	.42	.39	-.62	.49	.68	.57	.30	.40	.61	.43	-.37
Abandonment	.73	.72	.53	.61	.51	-.51	.48	.59	.67	.41	.42	.68	.41	-.42
Mistrust/Abuse	.71	.74	.48	.56	.45	-.61	.50	.68	.61	.41	.53	.69	.45	-.36
Social Isolation	.81	.66	.46	.48	.47	-.69	.56	.76	.56	.34	.35	.71	.43	-.48
Defectiveness/Shame	.71	.53	.44	.47	.44	-.61	.47	.69	.52	.24	.36	.74	.26	-.52
Failure to Achieve	.59	.46	.37	.46	.52	-.48	.47	.58	.48	.22	.28	.60	.28	-.48
Functional Dependence	.69	.56	.49	.58	.56	-.56	.52	.64	.56	.32	.37	.67	.31	-.56
Vulnerability	.64	.60	.37	.49	.43	-.54	.52	.58	.55	.32	.32	.61	.39	-.46
Enmeshment	.56	.50	.37	.43	.38	-.41	.48	.45	.51	.28	.25	.48	.38	-.35
Subjugation	.71	.62	.37	.49	.46	-.58	.69	.71	.62	.30	.33	.65	.48	-.50
Self-Sacrifice	.43	.43	.25	.37	.21	-.20	.47	.33	.45	.22	.19	.38	.55	-.09
Emotional Inhibition	.57	.50	.37	.37	.41	-.58	.54	.70	.53	.35	.41	.61	.41	-.45
Unrelenting Standards	.52	.44	.31	.35	.18	-.36	.46	.45	.54	.55	.28	.64	.74	-.14
Entitlement	.38	.48	.34	.45	.38	-.28	.24	.39	.43	.63	.50	.36	.36	-.17
Insufficient Self-Control	.52	.47	.42	.57	.78	-.39	.47	.58	.48	.38	.32	.50	.21	-.48

Note: YSQ = Young Schema Questionnaire; VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; all correlations were significant at $p<.001$; underlined figures reflect predicted associations.

Construct validity

The CTQ was assessed in a subsample of 482 participants, of which 259 were patients, and 223 non-patients controls. Construct validity assessed by the other questionnaires was done in a subsample of 348 participants, of which 187 were patients, and 161 non-patients. Mean age of this group was 33 years, while 46% were male, and 54% female. Table 8 depicts the Pearson correlations of the predicted and unpredicted associations of the short SMI and the theoretically linked questionnaires. Although all of the expected correlations appeared to be significant (with the exception of the correlation between the short SMI Undisciplined Child and the Compliant Surrender and the TCI Independence scale), only two predicted associations exceeded a Pearson value of .70. More specifically, good convergent validity was shown between the Vulnerable Child mode and the Loneliness Scale (r=.73) and between the Enraged Child with the trait anger subscale of the STAS (r = .77). In addition, although the other predicted strong associations between the Happy Child, Self Aggrandiser, Compliant Surrender, Demanding Parent and Healthy Adult modes and the other questionnaires were (slightly) lower than .70, these associations were higher than the non-predicted associations of those modes. The adaptive modes of the Happy Child and Healthy Adult correlated highly with the positive TCI scales. Contrary to our expectations, the trait anger of the STAS correlated higher with the modes of the Impulsive Child, the Undisciplined Child, the Detached Self-Soother, the Self Aggrandizer and the Punishing Parent modes than with their a-priori hypothesized mode scales. Likewise, the Impulsive and Undisciplined Child, Detached Self-Soother and Punishing Parent modes revealed a higher Pearson correlation with the Loneliness Scale, compared to the hypothesised correlations. The non-expected correlations were mostly lower than the expected ones and 183 out of these 258 correlations were lower than .30. Thus approximately 70% of the correlations displayed good discriminant validity.

In sum, only two out of the 22 a-priori predictions of convergent validity were adequately reproduced by the data, while 8 other associations, although not meeting the .70 criterion, pointed in the good direction, providing empirical support for concurrent validity of half of the subscales of the short SMI. In addition, the short SMI displayed good discriminant validity

Table 8: Pearson correlations between short SMI subscales and theoretically linked questionnaires.

	VC	AC	EC	IC	UC	HC	CS	DPt	DSS	SA	BA	PP	DP	HA
TCI														
Self-acceptance	**-.25**	**-.30**	**-.24**	**-.26**	**-.25**	**.22**	**-.21**	**-.22**	**-.25**	**-.34**	**-.27**	**-.26**	**-.21**	**.16**
Impulsiveness	**.13**	**.21**	**.33**	**.43**	**.27**	-.10	-.01	**.18**	.10	**.13**	**.23**	**.17**	-.06	**-.16**
Persistence	**.29**	**.27**	**.20**	**.15**	-.11	**-.25**	**.20**	.04	**.33**	**.31**	.11	**.31**	**.58**	.04
Pure-hearted conscience	.01	-.10	-.08	-.10	-.10	.08	.03	-.03	-.04	-.06	**-.17**	-.01	**.11**	.11
Uninhibited optimism	**-.70**	**-.54**	**-.37**	**-.42**	**-.43**	**.63**	**-.48**	**-.53**	**-.46**	**-.21**	**-.25**	**-.60**	**-.40**	**.47**
Revengefulness	**.16**	**.36**	**.33**	**.24**	**.19**	**-.23**	-.03	**.22**	**.12**	**.28**	**.41**	**.19**	.03	**-.13**
Inpersistence	**.17**	**.26**	**.16**	**.19**	.05	**-.16**	**.24**	**.23**	**.27**	**.37**	**.21**	**.28**	**.47**	-.02
Purposeless	**.36**	**.24**	**.19**	**.25**	**.32**	**-.33**	**.34**	**.41**	**.17**	.11	**.18**	**.32**	**.13**	**-.32**
Slowness	**.35**	**.23**	**.15**	**.23**	**.35**	**-.30**	**.41**	**.32**	**.19**	.10	.08	**.29**	**.14**	**-.38**
Detachment	**.29**	**.30**	**.24**	**.15**	**.20**	**-.39**	**.29**	**.43**	**.22**	**.16**	**.27**	**.32**	**.18**	**-.22**
Regimentation	-.10	**-.20**	**-.29**	**-.34**	**-.37**	**.12**	-.04	**-.19**	**-.12**	**-.32**	**-.38**	-.08	.11	**.12**
Dependence	**.14**	.02	.04	-.002	.02	-.09	.09	**.23**	.07	**-.12**	-.08	.07	.02	-.11
Independence	**-.13**	-.01	-.04	-.01	-.03	.06	-.09	-.05	-.07	**.11**	.08	-.06	.01	.08
IBI rigid moral	**.25**	**.40**	**.26**	**.33**	**.21**	**-.16**	**.21**	**.27**	**.30**	**.28**	**.35**	**.33**	**.35**	-.04
STAS trait anger	**.59**	**.68**	**.77**	**.67**	**.50**	**-.53**	**.30**	**.54**	**.54**	**.50**	**.55**	**.58**	**.33**	**-.39**
PDBQ narcissism	**.13**	**.28**	**.19**	**.25**	**.21**	**-.14**	.09	**.24**	**.31**	**.49**	**.47**	**.21**	**.12**	-.09
LS	**.73**	**.65**	**.47**	**.47**	**.38**	**-.72**	**.39**	**.66**	**.57**	**.25**	**.43**	**.62**	**.33**	**-.49**
RSQ fearful attachment	**.66**	**.58**	**.38**	**.40**	**.38**	**-.63**	**.41**	**.66**	**.56**	**.35**	**.42**	**.58**	**.42**	**-.36**
UCL palliative coping	**.24**	**.20**	**.16**	**.30**	**.25**	-.04	**.21**	**.16**	**.42**	**.17**	**.12**	**.21**	**.12**	-.06
CTQ Total abuse	**.55**	**.57**	**.36**	**.38**	**.25**	**-.49**	**.27**	**.48**	**.47**	.10	**.25**	**.50**	**.22**	**-.36**

Note: TCI = Temperament and Character Inventory; IBI = Irrational Belief Inventory; STAS = State-Trait Anger Scale; PDBQ = Personality Disorder Questionnaire; LS = Loneliness Scale; RSQ = Relationship Scales Questionnaire; UCL = Utrecht Coping List; CTQ = Childhood Trauma Questionnaire; VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; bold figures are significant at $p<.05$; underlined figures reflect predicted associations

Test-retest

Fifty out of 319 healthy controls (16%) who filled out the short SMI at baseline, were re-administered the short SMI again 4 weeks later (retest), with a maximum deviation of 3 days. This subsample of 50 non-patients (ascertained by means of SCID I and II) was composed out of 41 students and 9 respondents from the open population, 12 men and 38 women, with a mean age of 26.44 (SD = 11.19, range 18-57), and of which 33 were single and 17 married or lived together. This subsample was significantly younger, $t = 3.56$, $df = 317$, $p < .001$, higher educated, $t = 2.55$, $df = 317$, $p = .01$, and more frequently single, *Chi-sq.*= 51.82, $p < .001$, $df = 1$, compared to other non-patients. These differences are inherent to the fact that the retest subsample consisted mainly out of students (82 %), while other non-patients were mainly respondents from the open population (54.4 %). However, there were no significant differences on the scores on the subscales of the short SMI between both groups, using Bonferonni`s correction for multiple testing ($p = .05/16 = .003$), range $F(1,226) = 1.47$, $p = .23$ to $F(1,226) = 0$, $p = .99$. This indicated that despite both groups are not comparable in biographic characteristics, they are in mode scores, making the retest subgroup representative for a general non-patient group.

Table 9 displays means and standard deviations for the baseline and retest measures of all schema modes, along with the paired sample t-tests, ICC values and 95% confidence intervals. Differences in baseline and retest scores were not significant for any of the modes at a $p < .001$ level. Test-retest reliability of the separate modes range from .65 to .92, p`s $< .001$, with a mean of .84. These results indicate good test-retest reliabilities for all schema modes of the short SMI.

Table 9: Mean and standard deviations of baseline and retest measurement and test-retest reliability of the short SMI.

Short SMI subscales	Baseline	Retest	t (df=49)	p	ICC (95 % CI)
	Mean (sd)	Mean (sd)			
Lonely Child	1.40 (.40)	1.40 (.39)	-.17	.87	.89 (.81-.94)
Angry Child	1.72 (.38)	1.64 (.36)	1.5	.14	.65 (.39-.80)
Enraged Child	1.15 (.27)	1.13 (.23)	.55	.59	.85 (.74-.92)
Impulsive Child	2.19 (.55)	2.10 (.46)	1.53	.13	.78 (.61-.87)
Undisciplined Child	2.34 (.52)	2.32 (.51)	.43	.67	.89 (.81-.94)
Happy Child	4.56 (.43)	4.64 (.47)	-1.57	.12	.80 (.66-.89)
Compliant Surrender	2.48 (.61)	2.42 (.56)	.97	.34	.80 (.64-.88)
Detached Protector	1.45 (.42)	1.47 (.43)	-.48	.63	.92 (.87-.96)
Detached Self-soother	1.90 (.64)	1.85 (.69)	.75	.46	.87 (.77-.93)
Self-aggrandizer	2.26 (.53)	2.32 (.53)	-1.29	.20	.89 (.81-.94)
Bully and Attack	1.64 (.46)	1.40 (.33)	-.64	.52	.86 (.75-.92)
Punishing Parent	1.41 (.32)	2.96 (.59)	.29	.77	.75 (.56-.86)
Demanding Parent	3.01 (.54)	4.68 (.55)	1.11	.27	.91 (.84-.95)
Healthy Adult	4.68 (.58)	1.67 (.44)	-.05	.96	.92 (.86-.95)

DISCUSSION

We tested the psychometric properties of a new questionnaire for assessing schema modes; the Schema Mode Inventory (SMI). In order to improve the discrimination between the SMI subscales and to increase feasibility for both research and clinical purposes, a short version of the SMI was developed consisting out of 124 items. Results showed an excellent fit for the 14-factor model of this short SMI, good internal reliability of its subscales and moderate to high intercorrelations between the subscales. Furthermore, some modes displayed strong associations with several EMSs, and construct validity was reasonable. Test-retest reliabilities were excellent.

In selecting items for the subscales of the short SMI that loaded uniquely on their hypothesised subscales, insufficient items were found for the Abandoned and Abused Child and for the Over Controller modes. The reason for this might be that the items for these two scales were formulated too broadly, and therefore lacked specificity. Another reason might be that, although their developmental origins may differ, it is not possible to distinguish between these variants of the Vulnerable Child mode on the basis of self-report. This issue awaits further tests. We also suggest the Over Controller subscale should be split into two subscales: the Perfectionistic Over Controller which would be mainly displayed by patients with an obsessive compulsive PD, and the Suspicious Over Controller that would characterize patients with a paranoid PD. The present SMI did not have enough items specific to these hypothesized constructs to test their existence.

Despite that the current study was conducted in a large sample (N=863) it remains arguable whether this is sufficient for the CFA analyses due to the large number of items in the SMI (N=270 for the long SMI and N=124 for the short SMI). Rules of thumbs with respect to the subject to item ratio differ widely (see e.g., Bentler, 1989; Boomsma, 1982; Nunnally, 1967). Consequently, strict rules regarding samples size have mostly disappeared and replaced by the view that adequate sample size is partly determined by the nature of the data (see e.g., MacCallum, Zhang, Hong & Widaman, 1999). The fact that the findings of our study were quite robust and in line with our hypothesis, suggest that the current sample size was adequate. Nonetheless, further studies should be performed on the (short) SMI using larger samples sizes to test whether the current results can be replicated.

The short SMI proved to be best underlined by a 14-factor model. This indicates that it is preferable to distinguish most modes in separate subscales. So, although very high correlations were found between several subscales, the fact that the fit of the most-differentiated model was significantly better than that of the other models, and the fact that none of the confidence intervals around the correlation estimates between two factors included 1.0, indicates that all 14 scales do represent distinct constructs. This finding is in line with the clinical experience that skilled SFT therapists can distinguish quite adequately between the different modes. The short SMI has the advantage that the presence of several very specific modes can be assessed which makes it possible to test concrete mode conceptualizations of PDs. Therefore, it might be preferable to use the short SMI above the YAMI which is less fine-grained and only measures the presence of 10 general modes. Another reason to use the SMI, short version, is that items were empirically selected for good discriminatory qualities.

Without doubt, one of the most challenging issues with regard to the mode concept is the strong correlation with EMSs. Some EMSs and mode concepts are highly similar with respect to content, and in some cases it is difficult to make a clear distinction between these two concepts. However, because nearly all predicted associations between the EMSs and modes were very strong and markedly higher than the non-predicted associations, the overlap between the two concepts does not appear to be random, which provides extra support for their congruent validity. The highest associations were found between the Vulnerable Child and the Detached Protector mode and EMSs, indicating that especially these modes overlap with the EMS concepts. Indeed, these modes and their strongly associated EMSs are characterized by the same themes of loneliness, abandonment and detachment. Overall, the other modes contain more extreme behaviors (like uncontrollable anger or feelings of grandiosity) that are specific for patients with severe PDs. Perhaps therefore their overlap with EMSs is smaller. The fact that only moderate overlap was found between 8 of the modes and the EMSs does indicate the incremental value of the modes in explaining PDs. Future studies should test this issue further e.g., by conducting path analyses between the PDs and both modes and EMSs to see which concepts explain which PD best. In addition, because the main differentiation between EMSs and modes concerns the trait versus state conceptualization of these constructs, it might be even more important for future studies to evaluate the effect of mood inductions on mode representation in order to test the incremental value of modes to SFT.

Results confirmed that the presence of all dysfunctional modes increased significantly from non-patient controls to axis I patients to axis II patients and decreased similarly for functional modes. The strength of PDs predicted the presence of all modes over axis I pathology, while the number of axis I disorders predicted 13 out of 16 modes above axis II pathology. Furthermore, axis II pathology explained a higher percentage of the variance than axis I pathology did. These data underscore the assumption that schema modes are mainly correlated to PDs.

Although many of the results on the construct validity of the short SMI pointed in the good direction, only a few associations reached levels we a priori set with respect to convergent validity. This was true for two modes: the Vulnerable Child and the Enraged Child. The majority of the non-predicted associations demonstrated good discriminant validity. Possibly this moderate construct validity can be ascribed to the fact that modes reflect a combination of several features. For instance, no single emotion is represented in one mode, but rather a combination of emotions, beliefs and behaviors. In contrast, most questionnaires used to assess construct validity represent quite isolated emotions, thoughts or behaviors. Assessing validity by correlations with other self-report questionnaires is often further hampered by the fact that while the names of subscales suggest a construct the investigator has in mind, the actually measured construct can be quite different.

Retest mean values of all short SMI subscales appeared highly comparable to those of baseline measurements; both scores did not differ markedly form each other and test-retest reliability values ranged from good to excellent. Although at first sight these results indicate mode trait scores are highly stable over time, some considerations need to be taken in account. Firstly, the retest population consisted mainly out

of students. Even though mean scores on the modes did not differ between the test-retest subgroup and the remaining non-clinical population of this study, it cannot be predicted whether the remaining healthy population would demonstrate equally high stability in mode assessment over time. Secondly, it could be argued that mode scores in patients with severe PDs will be far more instable due to their characteristic dysregulated and instable affects (Clark, Livesly & Morey, 1997; Clark & Harrison, 2000). Thirdly, the current study assessed modes by means of a trait questionnaire. It could be possible that even strong altering modes can only be reflected by means of a state questionnaire, while trait scores could stay stable. Future studies should investigate the temporal stability of modes in PDs using a state version of the short SMI, in order to further investigate the theoretical claim of mode instability in PD patients.

Clearly, this study is only a small contribution to the validation of constructs used in SFT. A lot of work still needs to be done. With respect to the short SMI, an independent replication and assessment of test-retest reliability in patient samples is important. Because mode conceptualizations of PDs are still in progress, several additional modes have been proposed. For example, Bernstein, Arntz and de Vos (2007) hypothesized that psychopaths are characterized by a Predator mode and a Conning and Manipulative mode. These mode scales should be operationalized and added to the current short SMI. Clearly, it should be critically assessed whether further differentiation of modes is desirable, and to which degree it is still statistically advisable to further add schema modes. In addition, many questions remain regarding to mode conceptualization of the specific PDs. With respect to this, it would be informative to assess the relationship between the modes and all PDs by means of path analyses, in order to give insight into which modes are specific for which PDs. In addition, efforts should be made to assess mode-related behaviour, emotion and information processing by means of naturalistic, experimental or observational studies. With regard to mode switching, it would be of special interest to study the effect of mode presence in reaction to mood inductions, like was done in a study demonstrating increased presence of the Detached Protector mode in borderline PD patients after a specific stress induction (Arntz et al., 2005).

Despite SFT research is still in its infancy, this study provides a broad range of psychometric data of the short SMI, and forms a first step in the foundation of a central SFT construct. The psychometric results indicate that the short SMI is a valuable measure that can be of use for mode assessment in SFT.

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Chapter 4

Schema modes and childhood abuse in borderline and antisocial personality disorder

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ABSTRACT

Complex personality disorders (PDs) have been hypothesized to be characterized by alternating states of thinking, feeling and behavior, the so-called schema modes (Young, Klosko, & Weishaar, 2003). The present study tested the applicability of this model to borderline personality disorders (BPD) and antisocial personality disorders (ASPD), and related it to a presumed common etiological factor, childhood trauma. Sixteen patients with BPD, 16 patients with ASPD and 16 non-patient controls (all 50% of both sexes) completed a Schema Mode Questionnaire[1] assessing cognitions, feelings and behaviours characteristic of six schema modes. Participants were interviewed to retrace abusive sexual, physical and emotional events before the age of 18. BPD as well as ASPD participants were characterized by four maladaptive modes (Detached Protector, Punitive Parent, Abandoned/Abused Child and Angry Child). ASPD displayed most characteristics of the Bully/Attack mode, though not significantly different from BPD. The Healthy Adult mode was of low presence in BPD and of high presence in ASPD and the non-patients. Frequency and severity of the three kinds of abuse were equally high in both PD groups, and significantly higher than in non-patients.

INTRODUCTION

Recent insights have lead to the view that complex personality disorders (PDs) are not characterized by one set of pathogenic schemas, but by different sets that can be activated in alternation. Young for instance, has proposed schema modes as relatively independent organized patterns of thinking, feeling and behaving that underlie the different states of severe PD patients (Young, Klosko, & Weishaar, 2003). In Young's view borderline personality disorder (BPD) and antisocial personality disorder (ASPD) patients are characterized by various pathogenic schema modes. They are assumed to suddenly flip from one mode into another, especially in reaction to environmental changes caused by important events. Young hypothesized that four modes are central to BPD: the Detached Protector, the Angry and Impulsive Child, the Abandoned Child (in following with the second author in order to emphasize the central role of abuse, this mode will be further referred to as the Abandoned and Abused Child (Arntz & Bögels, 2000) and the Punitive Parent. There also is a Healthy Adult mode, however due to extreme psychopathology of these patients it is assumed to be of low presence. Young's schema mode model is the basis of his schema therapy for severe PDs, an increasingly popular therapeutic approach of which the effectivity is high (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006; Nordahl & Nysaeter, 2005).

When patients find themselves in the Abandoned and Abused Child mode, they feel the enormous pain and fear of abandonment caused by their abusive history that expresses itself in depressive, fearful, desperate, and inferiority feelings. This mode can be evoked by (perceptions of) (threatening) abandonment and abuse. Sometimes the patient becomes rebellious against the (supposed) injustice (s)he had experienced;

1 At the time this study was conducted, the Schema Mode Inventory (SMI) was not developed yet.

this elicits the state of the Angry and Impulsive Child in which all bottled up aggressive feelings discharge so that anger, manipulation and greed are acted out. The evocation of these two child-modes usually leads to activation of self-punishing moral rules, mostly the direct internalizations of the punishing behavior of one of the caregivers, accounting for the symbolic mode name of the Punishing Parent. In this mode, the patient is afraid (s)he did something wrong, sees him/herself as evil and worthless because of feelings and desires that are (threatened to be) activated. As a consequence of this self-directed anger, hate develops and the patient will punish him/herself in one or another way. Most of the time however, the patient finds him/herself in the Detached Protector mode, where (s)he does not have to feel the emotions and pain caused by the three other modes. The patient does not feel emotions, is unaware of any problems and is seemingly compliant (Arntz & Bögels, 2000; Arntz & Kuiper, 1998; Young et al., 2003).

As to ASPD, Young states that beside the Healthy Adult mode and the four modes described above, there is a fifth pathological mode present in antisocials called the Bully and Attack mode. In this mode, the antisocial hurts other people to overcompensate or to cope with mistrust, abuse, deprivation and defectiveness (Young, 2002; Young et al., 2003).

A study by Arntz, Klokman and Sieswerda (2005) investigated whether the four maladaptive schema modes are specific for BPD patients and whether BPD-relevant stress specifically increases one of the modes, the Detached Protector mode. The results indicated that BPD patients were indeed characterized by the modes. The stress induction induced negative emotions in all groups, but the BPD group was unique in that the Detached Protector increased significantly more than in cluster-C PD patients and nonpatient controls (all women).

The hypothesized similarity in schema modes of BPD and ASPD has not been studied yet. Nevertheless, at least two sets of empirical findings suggest that the overlap in schema modes may be considerable. First, it has been noted that there is a large overlap in symptomatic expression of the two PDs. Several DSM-IV diagnostic criteria of BPD and ASPD are quite similar, such as affect instability, inappropriate, intense and poorly controlled expression of anger and impulsivity that is potentially self-damaging (Blais & Norman, 1997; Holdwick, Hilsenroth, Casttebuty, & Blais, 1998). Furthermore, epidemiological figures point to high percentages of overlap; between 10 and 47% of BPD patients also meet the criteria for ASPD and about 70% display antisocial behavior (Paris, 1997; Widiger, Frances, & Trull, 1987; Zanarini & Gunderson, 1997). Averaged over studies approximately 70% of the ASPD patients meet BPD criteria (Widiger & Corbitt, 1997). Furthermore, while the prevalence in the community of both BPD and ASPD is about 1–2%, the sex distribution for ASPD is 80% male and for BPD 80% female. This would seem to make them 'mirror image' disorders. The gender difference could account to a large degree for the differences between BPD and ASPD; the differences in behavior being aggressiveness in ASPD and victimization in BPD could be a reflection of gender differences between men who more frequently display externalizing behavior and women who show more internalizing behavior. It has even been suggested that the two actually concern one underlying disorder, which expresses itself in BPD with women and in ASPD with men (Hudziak, Boffeli, Kriesman, Battaglia, Stranger et al., 1996; Widiger & Corbitt, 1997; Paris, 1997). Second, there also seems

to be a large overlap in etiological factors. Numerous studies over the past decade have pointed out the frequent occurrence of childhood trauma in patients with BPD. Between 1987 and 1992, eleven studies confirmed this high incidence of childhood trauma in borderline patients (Sabo, 1997). There are also studies reporting a positive relation between childhood abuse and ASPD (Burgess, Hartman, & McCormack, 1987; Dodge, Pettit, Bates, & Valente, 1995; Dutton and Hart, 1992; Horwitz, Widom, McLaughin, & White, 2001; Marchall & Cooke, 1999; Pollock, Briere, Schneider, Knop, Mednick et al., 1990; Wallen, 1992). The DSM-IV states that childhood abuse or neglect increases the probability of a conduct disorder evolving in ASPD (APA, 1995). Burgess et al. (1987) suggested a link between sexual abuse in childhood and later externalizing social deviant behavior. Dutton and Hart (1992) decided from file research of 604 male prisoners that men who were abused in childhood are three times more at risk of displaying violent behavior compared to non-abused men.

Despite the fact that these data suggest a central role of childhood abuse in both BPD and ASPD, there are - to our knowledge - only two studies that directly compared the prevalence and severity of abuse between both groups. Zanarini and Gunderson (1997) found in both groups substantial figures of childhood neglect and abuse, although verbal abuse and emotional withdrawal were reported by a significantly higher percentage of the BPD group compared to the ASPD group. A study by Herman, Perry, and van der Kolk (1989) found that BPD patients gave significantly higher reports of physical, sexual and witnessing violence traumas than patients with borderline traits and persons with no borderline diagnoses. No association was found for ASPD and trauma. However, this study did not concern a systematic comparison between both groups, instead BPD patients were compared with a group of persons with borderline traits and with a mixed non-borderline control group with schizotypal PD (n=6), ASPD (n=6) and bipolar II affective disorder (n=11).

The aims of the present study were twofold. Firstly, to assess and compare the presence of the hypothesized schema modes in borderlines, antisocials and non-patient controls. Secondly, the direct comparison of childhood abuse history in the three groups. In this study, gender was equally divided within both groups so that the probability to detect disorder-specific results is increased. This is of particular interest since gender plays an important role in the prevalence of abuse and the coping behavior of abused persons; girls are at two to three times greater risk for sexual victimization and women more often internalize the anger accompanying abuse, while men more often show an externalizing coping style (Carmen, Rieker, & Mills, 1984).

METHOD

Participants

Sixteen patients with BPD, 16 ASPD patients and 16 non-patient controls were included in this study. Gender was evenly distributed within the groups by planned stratification, so each group consisted of eight men and eight women. Patients were recruited in Belgium from three mental hospitals (OPZ Rekem, Medisch Centrum St-Jozef in Bilzen and Psychiatrisch Centrum Ziekeren in St-Truiden), a community mental health service (CCG Hasselt) and correctional institutions in Brugge, Gent and Antwerp. Non-patients were mostly hospital staff. The study obtained institutional Human Studies approval.

All subjects were screened with SCID-I (modules A–D) and SCID-II interviews. To be included, subjects had to be between 18 and 50 years of age, and of normal intelligence (IQ>80). Patients were admitted to the BPD group when they met DSM-IV criteria for BPD and not more than two ASPD criteria. ASPD patients had to meet DSM-IV criteria for ASPD and not more than two BPD criteria. Exclusion from the study occurred if patients met the criteria of a psychotic or bipolar disorder. Exclusion criteria for normal subjects were axis I or II disorders, and two or more BPD or ASPD criteria.

No between-group differences were found on age and intelligence. Mean age of the total sample was 30.9 years (BPD: 31.4; ASPD: 31.1; non-patients: 30.2), ages ranging in each group from 19 to 46 years. There was no difference between the groups concerning mean intelligence (BPD: 100.1; ASPD: 105.9; non-patients: 107.9). Neither did the clinical groups differ significantly in the presence of mood disorders (BPD: 62.5%; ASPD: 31.3%, n=16, $\chi^2(1)=3.14$, $p=.077$) or the mean number of axis II disorders (BPD: 1.88; ASPD: 1.27, Mann-Whitney corrected $Z=1.60$, $p=.11$).

The ASPD patients were significantly lower educated than the control group (Kruskal-Wallis: $\chi^2[2;N=48]=10.57$, $p=.005$), and a higher percentage of the patients were single (Chi-square: $\chi^2[2,N=48]=6.10$, $p=.047$). The analyses were not corrected for these two variables, because it was reasoned that they were inherent to BPD and ASPD.

Materials

Dutch versions of the SCID-I and SCID-II were used to assess DSM-IV axis I diagnoses and personality pathology (First, Spitzer, Gibbon, Williams, & Benjamin, 1997; First, Spitzer, Gibbon, Williamns, & Benjamin, 1994; van Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999; Weertman, Artnz, & Kerkhofs, 2000). Good factorial validity and good interrater reliability of the Dutch SCID-II have been demonstrated in other studies (Artnz, 1999; Weertman, Artnz, Dreessen, van Velzen, & Vertommen, 2003).

The Schema Mode Questionnaire was administered to assess the 6 schema modes under study. This questionnaire is largely based on the Schema Mode Questionnaire developed by Klokman, Arntz, and Sieswerda (2001) which assesses the presence of five modes i.e. the Detached Protector (e.g., 'It is best to keep a distance from other people', 'I feel empty'), the Angry Child (e.g., 'I have to ventilate my feelings and work them off', 'I directly satisfy my needs'), the Abandoned and Abused Child (e.g., 'I am helpless and powerless', 'I ask for reassurance'), the Punitive Parent (e.g., 'I am bad and deserve punishment',

'I feel guilty') and the Healthy Adult mode (e.g., 'I am worthwhile', 'I feel good'). Based on suggestions by Young (personal communication), McGinn and Young (1996), Beck and Freeman (1990), Arntz and Kuipers (1998) and clinical observations, this questionnaire was supplemented by cognitions, emotions and behaviours characteristic of the Bully and Attack mode (e.g., 'Attack is the best defence', 'I humiliate others'). The final Schema Mode Questionnaire consisted of seven items on cognitions,' five on emotions and five on behavior for each mode. Items were randomized within each category, resulting in a three-part questionnaire. Participants were instructed to rate the degree in which they generally believed in the stated cognitions, experienced the feelings described and engaged in the behavior on 100 mm VASs.

To assess for childhood abuse, an interview for traumatic events was used (Bossche, Kremers, Sieswerda, & Arntz, 1999). This interview retraces whether participants experienced certain abusive sexual, physical or emotional events before the age of 18. It specifies the actions, frequency, perpetrator(s), and the age of and the impact on the victims. The interview has predetermined answer categories and results in composite scores for sexual, physical and emotional abuse separately. The higher the composite score is, the higher are frequency and/or severity of abuse. These abuse scores were constructed out of the closeness of the perpetuators, the number of perpetrators, age-level at time of abuse (the younger the subject, the higher the score), duration (the longer the duration, the higher the score) and severity of what had happened. Internal consistencies of the subscales assessed with the Cronbach alpha proved excellent in the present sample: sexual abuse .82, physical abuse .91 and emotional abuse .90. To create a composite abuse score, Z-scores for each of the three types of abuse were computed and averaged.

Procedure

Subjects were individually seen at one of the institutions or prisons in Belgium between February and August 2002. At the start of the research procedure, informed consent was obtained. Participants were interviewed with both SCIDs and, if inclusion and exclusion criteria were met, with an interview for traumatic experiences. Then participants filled out the Schema Mode Questionnaire.

RESULTS

Schema modes in BPD and ASPD patients

The reliability of the Schema Mode Questionnaire was analysed. Five of the 102 items did not contribute to the internal consistencies of the subscales they were hypothesized to belong to. After elimination of these items, Chronbach's alpha coefficients showed excellent internal consistencies (see Table 1).

Table 1: Internal consistencies of the schema mode subscales as assessed with the Schema Mode Questionnaire.

Mode	Internal consistency
Detached Protector	.93
Angry Child	.87
Abandoned and Abused Child	.94
Punishing Parent	.91
Bully and Attack	.87
Healthy Adult	.88

Figure 1 depicts the mean scores of the groups on the six schema modes. Group differences were tested by means of MANOVA and Bonferroni corrected pair-wise comparisons. A multivariate test indicatesd a highly significant group effect, $F_{Hot}(12,78)=18.07$, $p<.001$. Univariate tests revealed significant group effects on all subscales, F (2, 45)>5.59, $p<.007$. The groups' means and standard deviations and contrasts between groups are presented in Table 2.

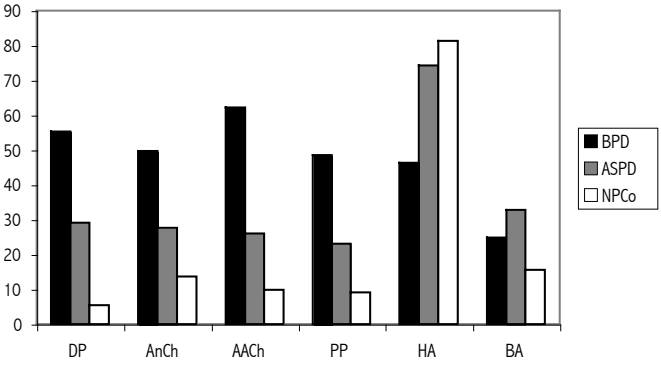

Fig. 1. Schema mode ratings by the three groups. DP—Detached Protector; AnCh—Angry Child; AACh—Abandoned and Abused Child; PP—Punishing; HA—Healthy Adult; BA—Bully and Attack.

Table 2: Mean, standard deviation and contrasts between groups of the modes.

Contrast$_{ij}$	m_i	sd_i	m_j	sd_j	t	p
Detached Protector						
BPD-ASPD	55.39	14.38	29.01	15.11	5.94	<.001
BPD-NpC	55.39	14.38	5.42	5.76	11.24	<.001
ASPD-NpC	29.01	15.11	5.42	5.76	5.31	<.001
Angry Child						
BPD-ASPD	49.80	10.24	27.54	14.26	5.65	<.001
BPD-NpC	49.80	10.24	13.67	8.02	9.17	<.001
ASPD-NpC	27.54	14.26	13.67	8.02	3.52	<.001
Abandoned and Abused Child						
BPD-ASPD	62.18	13.16	25.99	12.73	9.07	<.001
BPD-NpC	62.18	13.16	9.77	6.84	13.13	<.001
ASPD-NpC	25.99	12.73	9.77	6.84	4.07	<.001
Punishing Parent						
BPD-ASPD	48.58	16.08	13.06	11.88	5.88	<.001
BPD-NpC	48.58	16.08	9.16	7.16	9.09	<.001
ASPD-NpC	13.06	11.88	9.16	7.16	3.21	<.001
Healthy Adult						
BPD-ASPD	46.37	13.10	74.26	12.83	6.48	<.001
BPD-NpC	46.37	13.10	81.38	10.41	8.13	<.001
ASPD-NpC	74.26	12.83	81.38	10.41	1.65	.27
Bully and Attack						
BPD-ASPD	24.83	16.76	32.77	17.05	1.54	.32
BPD-NpC	24.83	16.76	15.54	8.18	1.80	.21
ASPD-NpC	32.77	17.05	15.54	8.18	3.34	.007

The BPD group scored significantly higher on the four BPD-related schema modes, and significantly lower on the Healthy Adult mode than the ASPD and the control group. Although borderlines tended to score higher on the Bully and Attack mode than the non-patients, this difference did not reach significance. In turn, antisocials also scored significantly higher on the four BPD-related schema modes than the control group. However, antisocials had lower scores on these modes than borderlines did. The Bully and Attack mode was significantly higher present in the ASPD group than in the normal control group, but the two PD groups did not differ significantly in that mode. ASPD patients scored significantly higher than the BPD group on the Healthy Adult mode. In fact, the presence of this mode did not differ significantly between the ASPD and control group.

The influence of gender on the mean scores of the modes was also analysed. A multivariate test revealed a gender effect, $F_{Hot}(6,37)=2.79$, $p=.024$. Univariate tests indicated that only the Bully and Attack mode was significantly stronger in men than in women, $F(5,42)=4.48$, $p=.04$. None of the modes showed a significant interaction between group and gender, $F(5,42)>.12$, $p>.21$.

To summarize, the modes of the Detached Protector, the Angry Child, the Abandoned and Abused Child and the Punitive parent are indeed, as hypothesized, characteristic of BPD patients and also, but in lower degree, of ASPD patients. The Bully and Attack mode appeared specific for the ASPD group, but the difference between ASPD and BPD failed to reach significance. The Healthy Adult mode was of low presence in the borderlines, while the antisocials reported this mode equally high as the non-patients.

Childhood abuse

Figure 2 demonstrates the mean composite scores of severity of sexual, physical and emotional abuse before the age of 18. A multivariate test indicated a highly significant group effect, $F_{Hot}(6,84)=2.31$, $p<.001$. Univariate tests also revealed significant group effects on all subscales, $F(2,45)>17.02$, $p<.001$. The groups with borderline and ASPD reported significantly higher rates of the three kinds of abuse than the non-patient group (see Table 3).

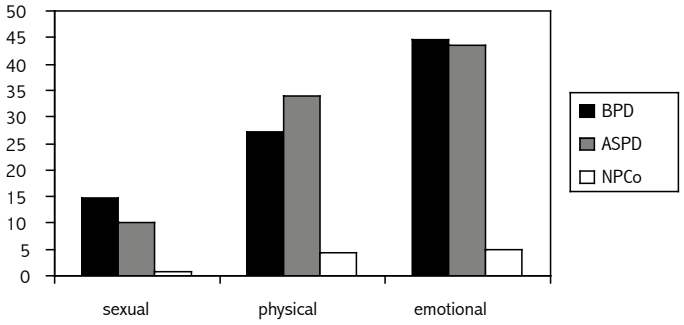

Fig. 2. Means of childhood abuse scores per group.

Table 3: Mean, standard deviation and contrasts between de groups of childhood abuse

Contrast$_{ij}$	m_i	sd_i	m_j	sd_j	t	p
Sexual abuse						
BPD-ASPD	14.69	9.90	10.19	9.75	1.59	.29
BPD-NpC	14.69	9.90	0.69	1.96	4.93	<.001
ASPD-NpC	10.19	9.75	0.69	1.96	3.35	.007
Physical abuse						
BPD-ASPD	27.25	17.64	34.00	17.95	1.27	.45
BPD-NpC	27.25	17.64	4.50	6.34	4.29	<.001
ASPD-NpC	34.00	17.95	4.50	6.34	5.57	<.001
Emotional abuse						
BPD-ASPD	44.50	12.86	43.56	14.73	0.22	.98
BPD-NpC	44.50	12.86	5.00	6.74	9.36	<.001
ASPD-NpC	43.56	14.73	5.00	6.74	9.13	<.001

Although BPD had higher sexual abuse scores than ASPD, whereas ASPD had higher physical abuse scores than BPD, these differences did not reach significance. Standardized z total scores of abuse were also not significantly higher amongst borderlines than amongst antisocials, which indicates that the prevalence and severity of abuse did not differ between the two groups.

Abuse data were analyzed more in detail concerning duration of the abuse, the number of perpetrators and abuse actions and the age-level at time of abuse. Inspection of these data showed borderlines experienced a higher number of sexual abuse actions compared to antisocials (means for BPD: 3; ASPD: 1.50). Furthermore, borderlines who were physically abused experienced this at an earlier age compared to physically abused antisocials (BPD: 84.6% before the age of 12; ASPD: 50% before the age of 12), while sexually abused antisocials experienced this earlier than sexually abused borderlines (ASPD: 81.8% before the age of 12; BPD: 46.2% before the age of 12). The data showed no difference between borderlines and antisocials concerning the duration and number of perpetrators of sexual, emotional and physical abuse. Neither did the amount of emotional and physical abuse actions and the age-level at time of emotional abuse differ between BPD and ASPD.

The influence of gender on the mean scores of the subscales of abuse was also analysed. A multivariate test demonstrated a significant gender effect, $F_{Hot}(3,40)=3.67$, p=.02. Univariate tests show that women had significantly higher sexual abuse score than men, $F(5,42)=4.57$, $p=.038$. Although men were more often physically abused than women, this difference failed to reach significance. Multivariate interaction between group and gender was not significant, $F_{Hot}(6,78)=1.75$, $p=.12$, as were the univariate tests.

It can be concluded that borderlines and antisocials reported substantially more sexual, physical and emotional abuse than the non-patient group. Prevalence and severity of abuse did not differ between borderlines and antisocials. Women reported significantly more sexual abuse than men.

DISCUSSION

We extended the Schema Mode Questionnaire developed by Klokman et al. (2001) to assess various schema modes as proposed by Young with a Bully and Attack mode, hypothesized to be specific for ASPD. In line with previous findings from Arntz et al. (2005), the extended Schema Mode Questionnaire showed good to excellent internal consistencies of the subscales, including the new Bully and Attack subscale.

The present study found, as hypothesized, that BPD patients were characterized by significantly higher scores on Detached Protector, Angry Child, Abandoned and Abused Child and Punitive Parent mode scales compared to the ASPD and non-patient control group. The BPD group scored lower on the Healthy Adult mode. Although BPD patients displayed some characteristics of the Bully and Attack mode, this mode is not specific to them, as their scores did not differ significantly from those of the non-pathological group. Also in line with the hypothesis, ASPD patients scored significantly higher than the non-patients but significant lower than the BPD group on the four BPD schema modes subscales. As hypothesized, ASPD patients displayed significantly more characteristics of the Bully and Attack mode than the non-patients, but the difference with the BPD group, though in the expected direction, failed to reach significance. Higher scores on the pathological modes could have been expected in the antisocials. Clinical observations for instance, suggest that antisocials frequently demonstrate behavior related to the Angry Child and the Bully and Attack modes. Underreporting of these modes by antisocials can be explained by their tendency to deny socially unacceptable behavior. It has indeed repeatedly been reported that antisocials pretend to be more 'normal' than they actually are (Limentanin, 1981; Walker, 1992; Walters & Greene, 1983). The high scores on the Healthy Adult mode, nearly equivalent to the non-patients' scores, are in line with this. As a consequence, the question rises whether self-report by antisocials is the best way to determine the presence of these modes.

The Bully and Attack mode appeared to be significantly stronger in men than in women. This may be related to aggression being in general more characteristic of men than of women. It could also be due to our formulation of the Bully and Attack mode items, which may state openly vented aggressive behaviours in particular which is more characteristic of men than of women. Other modes were not gender-dependent, suggesting that the schema mode theory applies for both men and women.

Since prevalence and severity of abuse history did not differ between the BPD and the ASPD group, and because of the supposed causal relationship between abuse and the Abandoned and Abused Child mode, equal scores on the presence of this mode were expected in both groups. However, this was not the case: ASPD patients scored this mode significantly lower than the BPD group did. Again, the findings hint at denial of the antisocials of this mode.

The results from the present study demonstrate that BPD and ASPD had experienced serious childhood emotional, physical and sexual abuse, significantly more than the non-patients. The prevalence of abuse did not differ between the BPD and ASPD group. These findings are consistent with findings by other studies on BPD and ASPD that demonstrated a high rate of childhood abuse in these patients. In contrast to the study by Herman, Perry, and van der Kolk (1989), our BPD patients did not experience more

cumulative pathological events than the antisocials. More detailed analyses of the data did show however, that borderlines had experienced a higher number of sexual abuse actions compared to antisocials. In contrast to the study of Herman, van der Kolk and Perry, our BPD patients did not report more physical and sexual abuse than ASPD patients. The latter discrepancy however, could be due to the low sample size (n=6) of the mentioned study. Further detailed analyses of the abuse data demonstrated borderlines were physically abused at earlier age than antisocials. The later onset age of physical abuse of antisocials could be due to the fact that many female antisocials reported physical abuse in early partner-relationships, and several male antisocials got involved in physical aggression (which sometimes was experienced as abuse) after the age of 12. It also appeared antisocials were sexually abused at an earlier age than borderlines. Our data indicated that women had significantly higher sexually abuse scores then men. No difference appeared between men and women concerning physical, emotional and total abuse score.

We also want to point out some restrictions of the present study and give recommendations for further research in this area. Firstly, there are shortcomings concerning the research population. Due to time constraint, clinical groups were only diagnosed on the presence of mood- and psychotic disorders on axis I. Furthermore, while working with antisocials there appeared a great diversity within this group. It would be advisable for further research to include a measure for psychopathy. Secondly, it should be mentioned that despite the highly significant results concerning the relation between BPD and childhood abuse and ASPD and childhood abuse, this strong relation does not imply causality. Thirdly, the present study solely used self-report data to assess schema modes. Clearly, observational, physiological and behavioural assessment should be done to further validate the construct. Fourthly, as mentioned before, there are several findings that hint at underreporting and denial by antisocials of negative emotions and cognitions characteristic of certain schema modes. It would be interesting to compare the data with measures of implicit presence of these emotions and cognitions. We tried to do this in a pilot study by means of a variant on the Implicit Association Task, but no conclusions concerning specific schema modes could be drawn. However, implicit measures may be of interest with ASPD because of the central role that is administered to denial within this PD.

In sum, BPD as well as ASPD were characterized by four maladaptive modes (Detached Protector, Punitive Parent, Abandoned/Abused Child and Angry Child). ASPD displayed characteristics of the Bully/Attack mode, but this presence did not significantly differ from BPD. The Healthy Adult mode was of low presence in BPD and of high presence in ASPD and the non-patients. Frequency and severity of the three kinds of abuse were equally high in both BPD and ASPD. It can be concluded BPD and ASPD show a substantial overlap concerning frequency and severity of childhood emotional, physical and sexual abuse and in the presence of the schema modes as described by Young, Klosko, and Weishaar (2003).

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Chapter 5

An empirical test of schema mode conceptualizations in personality disorders

Lobbestael, J., van Vreeswijk, M. & Arntz, A. (in press). An empirical test of schema mode conceptualizations in personality disorders. *Behaviour Research and Therapy.*

ABSTRACT

Although the use of schema modes in Schema-Focused Therapy (SFT) has been very popular since its introduction, Young's schema mode concept remained largely empirically untested. In order to provide insight into the mode conceptualization of personality disorders (PDs), the current study assessed the relationships between 14 schema modes and all PDs. Relationships between dimensional PD scores and self-reported mode scores were tested in a mixed study group of 489 participants, consisting of axis I and axis II patients, and nonpatients. Psychopathology was assessed by means of SCID I and SCID II or SIDP-IV interviews, and modes were assessed by the Schema Mode Inventory. Kendall's partial Tau coefficients, controlling each PD-mode correlation for all other PD scores, indicated unique mode profiles for all PDs and corroborated most of the hypothesized PD-mode correlations, supporting the construct validity of the mode model. Nevertheless, the high number of correlations found for some PDs, raises concerns about the specificity of the mode model. Implications for both research and therapy are discussed.

INTRODUCTION

Although the DSM-IV (APA, 2005) conceptualization of personality disorders (PDs) as discrete categories is considered the gold standard of PD diagnostics, alternative dimensional models of PDs have been suggested. Some of these models (e.g., Warner, Morey, Finch, Gunderson, Skodol et al. 2004; Morey, Hopwood, Gunderson, Skodol, Shea et al., 2007) yielded important insights about PD pathology, as did cognitive conceptualizations of PDs (e.g., Artnz, Dreessen, Schouten & Weertman, 2004; Beck, Butler, Brown, Dahlsgaard, Newman et al., 2001). The current study focuses on PD operationalization according to Schema-Focused Therapy (SFT) as developed by Young (Young, Klosko, & Weishaar, 2003), which is an elaboration of traditional Beckian cognitive therapy. One of the central features in SFT are the so-called schema modes. These are the predominant emotional states and coping responses triggered by situations to which people are oversensitive. Schema modes were introduced to SFT in order to explain the abrupt changes in thoughts, feelings and behaviours displayed by patients with severe PDs, mainly borderline PD (Lobbestael, van Vreeswijk & Arntz, 2007; Young et al., 2003). So far, 22 different modes have been defined of which some are hypothesized to be especially prominent in certain PDs (see the appendix for an overview of these modes). Studies targeting borderline PD have confirmed that this disorder is characterized by the Detached Protector, Abandoned/Abused Child, Angry Child and Punitive Parent modes, when compared to patients with cluster C PD, antisocial PD and non-patients (Arntz, Klokman & Sieswerda, 2005; Lobbestael, Arntz & Sieswerda, 2005). Still, most associations between schema modes and PDs have remained unaddressed, both in theoretical conceptualization and empirical founding. Therefore a large-scale study in a mixed study group consisting of non-patients and patients with axis I and axis II disorders can provide a test of the mode conceptualisation of PDs and give insight in the suitability of this model for assessment and treatment of PDs.

Thus, the aim of the present study was to investigate the correlations between PDs and schema modes and test the hypothesis of a unique mode pattern for each PD. Table 1 depicts the hypothesized PD-mode correlations. These are based on theoretical presumptions (Young et al., 2003; Arntz & Young, 2007) and earlier studies by Arntz et al. (2005) and Lobbestael et al. (2005).

Table1: Hypotheses on the PD-mode associations

PD	Hypothesized modes
Paranoid	Vulnerable Child / Angry Child
Schizotypical	-
Schizoid	Detached Protector
Histrionic	Impulsive Child / Vulnerable Child
Narcissistic	Self-Aggrandizer / Detached Self-Soother / Enraged Child / Vulnerable Child[1]
Borderline	Vulnerable Child[1] /Angry Child / Impulsive Child / Undisciplined
	Child / Detached Protector / Punitive Parent
Antisocial	Enraged Child / Bully and Attack mode
Avoidant	Detached Protector / Vulnerable Child / Punitive Parent
Dependent	Compliant Surrender / Demanding Parent / Vulnerable Child
Obsessive-compulsive	Demanding Parent / Punitive Parent / Vulnerable Child

Note: source: Arntz, A. & Young, J.E. (2007). Overview of hypothesized modes per personality disorder. Maastricht University: Internal document; Four hypothesized relations could not be tested in the current study because these modes were not assessed in the mode assessment questionnaire used in this study (SMI, see material section); paranoid and shizotypical PD with the suspicious overcontroller, obsessive-compulsive PD with the perfectionistic overcontroller and histrionic PD with the approval seeker mode; 1 Originally, narcissistic PD was expected to correlate with the Lonely Child mode and borderline PD with the Abandoned/Abused Child mode. These correlations could not be tested in the current study however because in the validation study of the SMI (see material section) the Lonely Child and the Abandoned/Abused Child had to be clustered together in the Vulnerable Child mode due to high intercorrelation (Lobbestael, van Vreeswijk, Spinhoven, Schouten & Arntz, The reliability and validity of the Schema Mode Inventory (SMI). Submitted for publication).

METHOD

Subjects

Data were analyzed from 489 subjects, including 390 patients from several psychiatric and forensic mental health care institutes and prisons in the Netherlands and Belgium (127 axis I patients, 240 axis II patients and 23 DSM-IV `Not Otherwise Specified` patients who did not fully met the criteria of an axis I or axis II disorder), and 99 non-patient controls. Of this group, 60.9% were female and 39.1% male, with a mean age of 32.99 years (SD = 10.68, range = 18 – 63). With respect to educational level, 1.4% did not complete primary school, 6.5% completed only primary school and 34.2% high school or low-level vocational studies, while 31.1% completed a secondary education and 26.8% a higher education. Of all PD patients, 10.77% (n = 43) received no diagnosis on axis I. The remaining participants received one or more axis I diagnoses of anxiety disorders (44.4%), mood disorders (34.2%), eating disorders (13.1%),

and substance abuse or dependence (13.1%), and other mental disorders (9.2%). Fifty-two % of the total study group (n = 252) received no diagnosis on axis II. The remaining 48% received one or more axis II diagnoses: borderline (22.3%), avoidant (14.7%), depressive (10.4%), obsessive-compulsive (8.4%), antisocial (8.6%), dependent (3.7%), paranoid (5.9%) or other PDs (< 3%).

General exclusion criteria were age < 18 and > 65 years, intoxication by alcohol or drugs during testing, IQ below 80, vision problems and not being native speaker of Dutch. Furthermore, exclusion from the study occurred if patients met the criteria of a psychotic or bipolar disorder because of the possibility of these disorders overshadowing the PD phenomena due to their high severity. The patients of the clinics and prisons were contacted to participate in this study by their therapists who were informed about the in- and exclusion criteria of the patients targeted for this study. The therapists provided general verbal information and an information letter of this study to these patients and if the patients indicated that they were willing to participate, they were contacted by the experimenter. Non-patient controls were recruited by means of advertisement in local papers.

Materials

Screenings instruments

Dutch versions of the Structured Clinical Interview for DSM-IV Axis I and Axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon & Williams, 1997; First, Spitzer, Gibbon, Williams & Benjamin, 1994; van Groenestijn, Akkerhuis, Kupka, Schneider & Nolen, 1999; Weertman, Arntz & Kerkhofs, 2000) were used to assess DSM-IV axis I diagnoses and personality pathology. Previous studies have supported the reliability and validity of the SCID I and SCID II. More specifically, inter-rater reliability proved to be adequate for SCID I (Martin, Pollock, Bukstein & Lynch 2000; Zanarini, Skodol, Bender, Dolan, Sanislow et al. 2000; Zanarini & Frankenburg 2001) and SCID II (median ICC for trait scores of seven PDs = 0.66, Weertman, Arntz, Dreessen, van Velzen & Vertommen, 2003; Cohens`s κ ranging from .48 to .98 for categorical diagnoses and from ICC=.90 to .98 for dimensional judgements, Maffei, Fossati, Agostoni, Barraco, Bagnato et al., 1997). Furthermore, internal consistencies of the trait scales of the SCID II were satisfactory (.71-.94, Maffei et al., 1997). Of the current study group, 97 SCID II interviews were rated twice (by means of audio taping the original interview), and yielded high interrater reliability values (ICC between .76 and .98, with a mean of .92). Interviewers were extensively trained and supervised by the first author. In 11 of the 489 cases (depending on the screening procedures within the clinics) the Structural Interview for DSM-IV Personality Disorders (SIDP-IV, Pfohl, Blum & Zimmerman, 1995; de Jong, Derks, van Oel & Rinne, 1997) was used to assess axis II pathology. This semi-structured interview is organized by topic sections rather than disorders (as in the SCID-II). Psychometric research in a Dutch opioid-dependent patient study group, demonstrated excellent reliability at criterion level (Cohen`s Kappa ranging from .76 to .93 and ICC ranging from .67 to .97), as well as on a diagnostic level (Cohen`s Kappa ranging from .66 to 1.00, and ICC ranging

from .88 to .99, Damen, Van der Kroft & De Jong, 2004). Research assessing the agreement between SCID II and SIDP-IV demonstrated good convergence between the two interviews (Saylor, 2003), indicating both interviews can be used within one study for screening purposes.

Schema modes

The presence of schema modes was assessed with the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael, Weishaar et al., 2007). The SMI measures the presence of 14 schema modes: Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, Undisciplined Child, Happy Child, Compliant Surrender, Detached Protector, Detached Self-Soother, Self-Aggrandizer, Bully and Attack, Punitive Parent, Demanding Parent and Healthy Adult modes. Schema modes can be clustered into four categories; dysfunctional child modes that result out of unmet core childhood needs, dysfunctional coping modes that correspondent to an overuse of the fight, flight or freeze coping styles and dysfunctional parent modes that reflect internalized behaviour of the parent towards the child. Additionally, there are two adaptive modes; that of the Healthy Adult that reflects adaptive thoughts, feelings and behaviours and that of the Happy Child, a playful and spontaneous mode. While the SMI was originally set up to measure the presence of 16 modes, based on the item-loading values, not enough items could be selected for the Abandoned and Abused Child and the Over Controller modes that represented these modes uniquely. Consequently, the items of the Abandoned and Abused Child mode were combined with those of the Lonely Child mode, construing the Vulnerable Child mode, and the Over Controller mode was removed from the SMI (for a more detailed description see Lobbestael et al., Submitted for publication). The SMI consists of 124 items that have to be scored on frequency using a 6-point Likert scale ranging from `never or hardly ever` to `always`. An overall score is calculated from the scale sum score divided by the number of items in that scale. A higher score reflects a more maladaptive schema mode. A psychometric study of the SMI (N= 863), showed an excellent fit for the 14-factor model (CFI = .98) and good internal consistencies of the subscales (Cronbach`s α ranging from .76 to .96, mean = .86). Furthermore, inter-correlations between the subscales were moderate to high, construct validity was reasonable, and the test-retest reliability was excellent (mean ICC = .84). Comparing of the SMI subscale scores with that of content similar questionnaires indicated good discriminant validity and moderate convergent validity (Lobbestael et al., submitted for publication).

Procedure

The study received ethical approval from the Medical Ethical Committee of the Academic Hospital in Maastricht, the Netherlands. All subjects gave written informed consent. Participants were administered with SCID-I and SCID-II interviews and next filled out the SMI. In some cases, diagnostic information from the SCIDs or the SIDP-IV was already available from patients' clinical records. Finally, participants were debriefed, thanked for their participation and received a small financial compensation.

Statistical analyses

The PDs were expressed dimensionally by adding the scores (range 1 to 3) of each SCID II criteria per PD. Ten PDs were assessed; all cluster A, B and C PDs with the exception of the PDs from the DSM-IV appendix. Inspection of the data showed non-normal distributions of both level of PDs and modes. The associations between each of the 10 PDs and each of the 14 modes were therefore calculated by means of Kendall`s partial Tau correlations. Since it was intended to make PD-specific conclusions on the mode presence, the influence of the other PDs was partialled out. Thus, all correlations represented the relationships between the specific PDs and the specific modes corrected for the other PDs. Significance tests were based on two-tailed Z-tests with $Z = 3\ t \sqrt{n(n-1)} / \sqrt{(2(2n+5))}$, which is applicable for sufficiently large sample sizes ($n>50$, Johnson, 1979; Shirahata, 1977; Simon, 1977). Note that, when not being -1, 0 or 1, the absolute values of Kendall`s partial Tau correlations are always lower than Pearson correlations. Thus, strengths of these correlation values can not be interpretated in a similar vein. Correlations significant at the $p<.05$ level were tentatively interpreted as possible relationships, while correlations significant at the Bonferroni-corrected level of $p<.001$ were interpreted as empirically supported relationships. Only the relationships significant at $p<.001$ are described in the result and discussion sections.

Results

Table 2 displays the correlations between all PDs and all schema modes. Overall, 36 of the 140 correlations were significant at $p<.001$, and 23 at $p<.05$. Eight out of these 36 strong associations were negative, of which 6 reflected negative associations with the adaptive modes. Regarding the positive associations between the maladaptive modes and the PDs, the number of correlations varied from 0 to 9 between PDs, with a mean of 2.8 per diagnosis. The borderline and avoidant PDs correlated with the highest number of maladaptive modes, respectively 9 and 5.

In cluster A, paranoid PD correlated positive with the Angry Child, the Enraged Child and the Bully and Attack modes, and negative with the Happy Child mode. With respect to cluster B PDs, histrionic PD was connected with the Impulsive Child mode and narcissistic PD with the Self-Aggrandizer and Bully and Attack modes. Borderline PD displayed an association with the Vulnerable Child, the Impulsive Child and the Punitive Parent, the Enraged Child and the Detached Protector, the Angry Child, the Detached Self-Soother, the Undisciplined Child and the Compliant Surrender modes. Borderline PD was negatively associated with the two adaptive modes. The relationship between antisocial PD and the modes were positive for the Enraged Child and the Bully and Attack modes, and negative for the Demanding Parent and Compliant Surrender modes.

Regarding cluster C disorders, avoidant PD correlated positive with the modes of the Vulnerable Child and the Detached Protector, the Compliant Surrender, the Punitive Parent and the Undisciplined Child and negative with the two adaptive modes. The dependent PD displayed a positive correlation with the Compliant Surrender, the Vulnerable Child and the Undisciplined Child modes, and a negative correlation with the Healthy Adult mode. Obsessive-compulsive PD was associated with the Demanding Parent, the Self-Aggrandizer and the Detached Self-Soother modes.

Table 2: Kendall`s partial Tau correlations between PDs and schema modes, corrected for the other PDs.

Personality disorder	VC	AC	EC	IC	UC	HC	CS	DPt	DSS	SA	BA	PP	DP	HA
Paranoid	.05	.18**	.14**	.03	.03	-.11**	-.04	.06*	.07*	.06	.11**	.04	.04	-.01
Schizotypical	.009	.03	.01	.05	-.03	.05	.005	-.04	-.01	-.01	-.01	-.05	.01	.08*
Schizoid	.02	.03	.002	-.04	-.08*	-.06	.06	.08*	-.04	-.03	.005	.06*	.008	-.03
Histrionic	-.03	.009	-.007	.14**	.10*	.09*	.004	-.004	.06*	.06*	.04	-.008	-.001	-.01
Narcissistic	.002	.04	.03	.02	.07*	-.02	.02	.05	-.004	.20**	.18**	.02	.03	.002
Borderline	.31**	.26**	.28**	.29**	.17**	-.28**	.11**	.28**	.23**	.02	.08*	.29**	.06*	-.22**
Antisocial	-.08*	-.02	.16**	.08*	.03	-.02	-.13**	-.02	-.03	.003	.10**	-.04	-.15**	.01
Avoidant	.22**	.09*	.04	-.01	.12**	-.23**	.21**	.22**	.09*	-.02	.03	.20**	.08*	-.20**
Dependent	.14**	.03	-.03	.02	.12**	-.08*	.19**	.06*	.08*	-.002	-.0002	.09*	.04	-.16**
Obsessive-compulsive	.03	.05	.01	.06	-.03	-.04	.02	.03	.12**	.17**	.08*	.03	.20**	.03

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; * p <.05; ** p <.001.

DISCUSSION

The current study tested the correlations between PDs and schema modes. Unique patterns of modes were found for the different PDs suggesting that the combination of mode scores rather than the scores on each isolated mode provides the best insight in that specific PD. The fact that most strong correlations found between PDs and modes were hypothesized, suggests (at least in part) good construct validity of the mode model. Overall, 18 out 26 hypothesized relations were evidenced and 11 new associations between maladaptive modes and PDs emerged. For some PDs (like obsessive-compulsive and narcissistic) there appeared a confined model of modes. In other PDs (like borderline and avoidant) there were so many modes present that the question emerges what the value of the mode model for these PDs is. Ironically, while the mode concept was added to SFT in order to deal with the high number of schema's present in some PDs (notably borderline), again, many modes appear characteristic for borderline PD. Some PDs were associated with many maladaptive modes and others only with a few. This might indicate that a higher number of correlations merely reflects a high score on a general psychopathology factor. The finding that those PDs that correlated positively with the highest number of maladaptive modes, also correlated negatively with the adaptive modes, corroborates this hypothesis. On the other hand, the current findings can only be partly explained by one underlying severity factor because not *all* mode correlations became stronger with increasing PD severity but unique PD-mode associations emerged.

In line with our hypothesis, paranoid PD was characterized by modes that emphasize anger, which stresses the importance of anger in these patients (APA, 2005). The rapid shifts in emotions histrionic patients display, their impulsive gratifying behaviour, and the fact that they can be highly suggestible (APA, 2005) was reflected in a link with the Impulsive Child mode. The narcissistic PD-Self-Aggrandizer mode association matches Young's hypothesis, and can be explained by their megalomaniac self-representation (APA, 2005; Beck, Freeman & Davis, 2004; Raskin, Novacek & Hogan, 1991a). The presence of the Bully and Attack mode in narcissists parallels the link between narcissism and rather intentional and controlled denigrating aggression (Bushman & Baumeister, 1998; Baumeister, Smart, & Boden, 1996; Raskin, Novacek, & Hogan, 1991b; Wink, 1991). Because all correlations with other PDs are statistically controlled for in this study, this indicates that despite narcissistic PD is usually thought to be associated with anger through the link with a specific form of antisocial PD, anger does form a central aspect of narcissistic PD.

As expected, the strongest positive relationships were found between borderline PD and the Vulnerable Child, the Angry Child, the Impulsive Child, the Undisciplined Child, the Detached Protector and the Punitive Parent modes. Borderline PD appeared to be related to several other modes as well. The link with the Enraged Child mode is not surprising given their anger expression can be extreme and out of control (APA, 2005; Gardner, Leibenluft, O'Leary, & Cowdry, 1991). The strong correlation with the Detached Self-Soother can be related to the high level of alcohol- and drug abuse of borderline patients in general (Trull, Sher, Minks-Brown, Durbin & Burr, 2000) and of the current sample (correlation between borderline criteria and substance abuse/dependence: Spearman`s rho = .36, $p<.001$). The clinging behaviour and the need for approval of borderline patients (APA, 2005; Bender & Skodol, 2007; Fossati, Donati, Donini, Novella,

Bagnato, & Maffei, 2001) accounts for the strong relationship with the Compliant Surrender mode. The fact that the hypothesized correlations between borderline PD and modes appeared to be stronger than the non-hypothesized correlations, provides empirical evidence for the borderline mode model. As expected from their recurrent criminal behaviour (APA, 2005), antisocial PD patients mostly reported aggression-related modes. The fact that the typical antisocial patient is rather undisciplined and not obedient accounts for the negative correlations with the Demanding Parent and the Compliant Surrender modes.

As to Cluster C, the mode patterns displayed by the avoidant and dependent PDs were more alike than expected; both disorders appeared to be characterized by feelings of defectiveness and loneliness (Vulnerable Child), a passive style and a lack of perseverance (Undisciplined Child) and the tendency to give in to other people (Compliant Surrender, APA, 2005; Beck et al., 2004). Furthermore, the avoidant behaviour of avoidant PD patients causes them to disconnect from other people and their emotions (Detached Protector) and avoidant patients are strict and punitive towards themselves (Punitive Parent, APA, 2005). Obsessive-compulsive PD displayed the expected correlation with the Demanding Parent mode, reflective of the high standard these patients set for themselves (APA, 2005; Halmi, Tozzi, Thornton, Crow, & Fichter, 2005) and the Self-Aggrandizer mode, which reflects that these patients often think quite highly of themselves; they tend to view themselves as very capable because they do things `right` and precise and think others are incapable and irresponsible and therefore inferior to them, because others do not meet their high standards (Beck et al., 2004). There appeared a relationship between obsessive-compulsive PD and the Detached Self-Soother mode probably because this mode contains workaholism items which could indicate that the compulsive behaviour obsessive-compulsive patients display has a self-soothing purpose. Contrary to our expectation, the Vulnerable Child mode was not found to correlate to paranoid, histrionic, narcissistic and obsessive-compulsive PDs which could indicate that these patients are not likely to acknowledge their vulnerable side.

Some drawbacks should be acknowledged. First, the associations between the Abandoned and Abused Child, Lonely Child and the Over Controller modes and the PDs could not be assessed because these modes were not represented in the SMI. It is not clear whether these constructs can be distinguished empirically (Lobbestael et al., submitted for publication). Second, since mode conceptualizations of PDs are still in development, several additional modes have been proposed. For example, Bernstein, Arntz and de Vos (2007) hypothesized that psychopaths are characterized by a Predator mode and a Conning and Manipulative mode. These mode scales should be operationalized and their relationship with PDs should be assessed. Third, the fact that the associations found between the PDs and the modes make theoretical sense only provides evidence on one aspect of construct validity. Clearly, future studies using prospective longitudinal designs (see e.g., Morey et al., 2007) are necessary in order to assess the predictive value of schema modes, as well as correlations with general pathology constructs like the Five Factor model (Widiger & Lowe, 2007), or cognitive constructs like Beckian beliefs (Arntz et al., 2004; Beck et al., 2001). Finally, the current study used two different axis II assessment instruments. Although the SIDP-IV was only used with 11 participants and there are indications that there is good convergence between the SCID II

and SIDP-IV interviews (Saylor, 2003), other studies (e.g., Oldham, Skodol, Kellman, Hyler, Rosnick et al., 1992) using other axis II interviews did report divergent prevalence rates and PD comorbidity patterns with different instruments. Therefore, it can not be ruled out that the use of two different axis II assessment instruments (the SCID II and the SIDP-IV) influenced axis II assessment in this study, though the influence can only be small as only 2.2% of the participants had SIDP-IV based scores.

This study was the first to empirically assess the correlations between schema modes and PDs in a large study group of mixed PDs, using validated PD and mode assessment instruments. In conclusion, the present study suggests that there are different patterns of schema domains across different PDs and that the SMI is useful in differentiating between these PDs. These findings have important implications for SFT because they indicate which modes can be expected to be prominent in, and specific to, the various PDs. This helps therapists and patients in understanding the dysfunctional patterns in the patient' life and steers which techniques the schema therapist can use to address the patient's personality problems.

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Chapter 6

Antisocial patients underreport the presence of their maladaptive schema modes as compared to their therapists

Lobbestael, J., Arntz, A., Löbbes, A. & Cima, M. Antisocial patients underreport the presence of their maladaptive schema modes as compared to their therapists. *Submitted for publication.*

ABSTRACT

Due to the tendency of antisocial patients to lie and to act supernormal, it is often suggested that the sole use of self-report instruments in therapy and research with these patients might be questionable. This premise however has hardly been put to the empirical test. The current study therefore examines whether a response style to underreport psychopathology is indeed specific for antisocial patients by assessing the agreement between self- and other reported schema modes, one of the central features in Schema-Focused Therapy. Patient's self-report and therapists' report on the Schema Mode Inventory were compared in a sample of 96 patients with antisocial, borderline or cluster C personality disorder as assessed with the SCID II.

Results indicate a markedly stronger self-therapist discrepancy in mode rating in antisocial patients than in borderline and cluster C patients. These findings underscore the importance for the use of alternative assessment methods of cognitive concepts in antisocial patients. Implications for therapy and research are discussed.

INTRODUCTION

Next to persistent antisocial behaviour, one of the main features of antisocial personality disorder (PD) is deceitfulness as manifested in repeated lying (APA, 2005). Additionally, antisocial patients are characterized by defensive responding (de Ruiter & Greeven, 2000) and a tendency to over-report healthy behaviour (Cima, 2003). This denying response style of antisocials forms a major problem because it diminishes the reliability of their self-report, which has negative effects for both therapy and the reliability of research in this population. It has also caused several authors to advice against the use of self-report inventories with forensic subjects (Gacono & Meloy, 1994; Hare, 1991) and probably contributed to this patient group being viewed as therapy-resistant (Harris & Rice, 2006).

One possible way to circumvent the frequent lying of antisocial patients is by using alternative sources of information than self-report. Since the therapeutic relationship is considered a useful context for assessing key dysfunctional beliefs (Beck, Butler, Brown, Dahlsgaard, Newman et al., 2001), this study compares self-report by patients with antisocial, borderline and cluster C PD with reports by these patients` therapists. This way, it can be assessed whether a denying response style is indeed specific for patients with an antisocial PD as compared to other PD patients.

We asked patients and therapists to rate schema modes, one of the central concepts of Schema-Focused Therapy (SFT, Young, Klosko, & Weishaar, 2003). Schema modes reflect state-depending clusters of thoughts, feelings and behaviours. Recently, it was demonstrated that SFT was highly effective in treating borderline patients (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006). Furthermore, SFT is becoming increasingly implemented within the forensic treatment settings (Bernstein, Arntz, & de Vos, 2007). Modes can be adaptive or maladaptive. Until now, 14 different schema modes have been identified that can be clustered into four categories; first, maladaptive child modes that result out of unmet

core childhood needs, second, dysfunctional coping modes that correspondent to an overuse of the fight, flight or freeze coping styles and third, dysfunctional parent modes that reflect behaviour of the patients` parent(s) towards the patient as a child that the patient has internalized. Fourth, there are two healthy modes; that of the Healthy Adult that reflects adaptive thoughts, feelings and behaviours and that of the Happy Child that is developed when core childhood needs were adequately met and causes the patient to feel safe, confident and optimistic (see the appendix for an overview of the modes).

A previous study (Lobbestael, Arntz, & Sieswerda, 2005) already raised questions about the reliability of self-reported schema modes in antisocial patients because these patients indicated very high levels of healthy modes that even did not differ significantly from non-patient controls. In another study (Lobbestael, van Vreeswijk & Arntz, Submitted for publication), antisocial PD was negatively correlated to several maladaptive self-reported modes. Cleary, these findings do not match clinical observation of high levels of pathology in these antisocial patients. We are not aware of any previous studies comparing self- and other-report of schema modes or other cognitive concepts in specific PDs.

In sum, the present study compares the self-reported schema modes of PD patients with the mode ratings of their therapists. We hypothesize that there will be a strong discrepancy between self- and other report in the antisocial population due to frequent underreporting of maladaptive constructs by these patients. More specifically, we expect therapists to indicate a higher level of pathological modes and a lower level of adaptive modes (i.e. the Healthy Adult and Happy Child modes) than the antisocial patients report themselves. In contrast, more agreement is expected between self and other report of modes in patients with borderline PD and cluster C PD, which are used as PD control groups. Additionally, the influence of the level of psychopathy of the antisocial group on the self- versus other report will be tested.

METHOD

Subjects

Self-reported modes were compared with mode report of their therapists for N=96 patients, divided over three patient groups: patients with antisocial PD (n = 19), patients with borderline PD (n = 49) and patients with cluster C PD (avoidant, dependent and/or obsessive-compulsive PD, n = 28). The antisocial patients were all male, while the borderline group consisted of 38 women and 11 men, and the cluster C group of 20 women and 8 men. Consequently, the groups differed significantly with respect to gender, χ^2 (2)= 33.72, p = <.001. Mean age of the antisocial PD group was 35.12 years (range: 22 to 51), for the borderline PD group 33.10 (range: 19 to 53), and 37.61 for the cluster C group (range: 20 to 57). The groups did not differ significantly in age, *Kruskal-Wallis*: χ^2[2; N = 96] = 3.15, p = .21. Educational level was assessed by determining which of the five levels of the Dutch scholar system the participant completed (from receiving no education to completing a higher education). Results indicated that the antisocial group was significantly lower educated than the two other groups, *Kruskal-Wallis*: χ^2[2; N = 96] = 22.28, p <.001. The majority of all patients were single (antisocial PD: 69%, borderline PD: 69% and cluster C PD: 57%), and thus there were no group differences in this respect, χ^2 (2)= 3.17, p = .21. General exclusion

criteria were a psychotic or bipolar disorder, age < 18 and > 65 years, intoxication by alcohol or drugs during testing, IQ below 80, vision problems and not being native speaker of Dutch. The ethical committee of the Academic Hospital of Maastricht (the Netherlands) approved this study.

Materials

Screenings instruments

Dutch versions of the Structured Clinical Interview for DSM-IV Axis I and Axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon, & Williams, 1997; First, Spitzer, Gibbon, Williams, & Benjamin, 1994; van Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999; Weertman, Arntz, & Kerkhofs, 2000) were used to assess DSM-IV axis I diagnoses and personality pathology. Previous studies (Martin, Pollock, Bukstein, & Lynch, 2000; Zanarini & Frankenburg, 2001; Zanarini, Skodol, Bender, Dolan, Sanislow et al., 2000) revealed adequate inter-rater reliability of the SCID I. Satisfactory interrater reliabilities and internal reliabilities for SCID II were found (Maffei, Fossati, Agostoni, Barraco, Bagnato et al., 1997; Weertman, Arntz, Dreessen, van Velzen, & Vertommen, 2003). In the current sample, double rating of 90 SCID II interviews yielded high inter-rater reliabilities values (ICC between .76 and .98, with a mean of .92).

Psychopathy Checklist – Revised (PCL-r)

The PCL-r (Hare, 2003) is a 20-item semi-structured interview of behaviors and characteristics associated with psychopathy, with this information then being corroborated by file records. Each item is scored 0,1 or 2, for a maximum total score of 40. Ratings on the PCL-r were made by staff of the forensic hospitals or by the first author who were extensively trained in the administration of the PCL-r. In general, the inter-rater reliability of the PCL-r proved to be good, as was the internal consistency (Hare et al., 1990). Previous studies revealed a two-factor, four-facet hierarchical model of the PCL-r (Bolt, Hare, Vitale, & Newman, 2004). The four facets are: interpersonal (facet 1), affective (facet 2), lifestyle (facet 3) and antisocial (facet 4). These four facets load onto two higher order factors: interpersonal (factor 1), and lifestyle/antisocial (factor 2). The total level of psychopathy, the PCL-r factors and facets were expressed continuously.

Schema modes

In order to compare self- with other reported schema modes, a short version of the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael, Weishaar, van Vreeswijk, & Klokman, 2007) was composed. Item selection from the long SMI version was based on face validity assessment of adaptability for other-report (items describing more external, observable aspects rather than internal motivations) and good psychometric values of the items in earlier studies (Arntz, Klokman, & Sieswerda, 2005; Lobbestael et al., 2005). In this short SMI each of the 14 modes was represented by three items, making a total of 42 items. For the other-SMI version, questions were grammatically adapted to make them suitable for the assessment of behaviours, feelings and cognitions of patients (e.g. `*He* finds *himself* a good person`). Items had to be scored on frequency using a 6-point Likert scale ranging from `never or hardly ever` to

`always`. An overall score for each mode was calculated from the scale sum score divided by three. In the current sample, internal consistencies of these 14 subscales of the self-SMI version ranged from α =.41 to α =.81, with a mean Cronbach`s $\alpha$ of .63. For the other-SMI version, internal consistencies of these 14 subscales ranged from $\alpha$ =.59 to $\alpha$ =.80, with a mean Cronbach`s α of .72.

Procedure

Informed consents were signed, the SCID interviews were administered to all participants and antisocial patients were interviewed with the PCL-r. Next, all participants filled out the short SMI. Finally, participants were debriefed and thanked for their participation. The patient's main therapist filled in the other-report version of the SMI, which was mostly returned to the researcher within two weeks.

Statistical analyses

First, therapists' ratings of the patients' schema modes were compared between the groups by means of simple contrasts (antisocial PD group versus borderline and cluster C PD group). To test for gender differences these simple contrasts were repeated in the male sample only. It was tested whether the results obtained before in the complete sample would be the same for men.

Comparison between self- and other report of modes was assessed by means of repeated measures analyses with report (2 levels: self and other) and modes as within subject variables and group as between subject variable. This repeated measure analyses was done twice; once for the adaptive modes (2 levels) and once for the maladaptive modes (12 levels). Post-hoc tests were performed in two ways. First, paired sample t-tests were performed to test whether self- and other-report differed significantly from each other for each mode within each group. Second, groups were compared with simple contrasts (antisocial PD group versus borderline and cluster C PD group), to test whether the discrepancy between self- and other-report in the antisocial PD group differed markedly from that difference in the borderline and cluster C PD groups. To test for gender differences, ANOVA analyses were performed on only the male subjects with the difference score (i.e. self versus other report) of the schema modes as the dependent variable and group as fixed factor. It was tested whether the results obtained before in the complete sample would be the same for men.

Finally, in order to determine the influence of psychopathy on the self-versus other mode report in the antisocial group, Pearson Correlations between the change scores and the total PCL-r score, factor 1 and 2, and facet 1 to 4 were calculated.

RESULTS

Therapists` ratings

Means of the self- and other mode scores for each group are presented in table 1. Results of the total sample indicated a stronger presence of the Undisciplined Child, Self-Aggrandizer, Bully and Attack and Healthy Adult mode of the antisocial PD-patients as compared to borderline PD and cluster C-patients, and ratings of the Enraged Child and Impulsive Child were stronger in the antisocial PD group as compared

to the cluster C group. Therapists indicated a lower presence of the Compliant Surrender and Demanding Parent mode in the antisocial PD-patients than in the borderline PD and cluster C patients (see table 2). Analyses of the male sample only (see table 2) revealed that the contrasts between the antisocial PD group and the borderline PD group disappeared for the Undisciplined Child, the Compliant Surrender, the Self-Aggrandizer and the Bully and Attack modes. The contrast between the antisocial PD and the cluster C group disappeared for the Enraged Child and the Undisciplined Child. This possibly indicates that these 6 contrasts cannot be attributed to group differences, but to the male gender, although there might be a type II error given that differences remained comparable and loss of significance was mainly due to smaller samples. Taken together, the results on the therapist reports of modes indicate that, the possible gender confounding taken into account, the contrasts between the antisocial PD and borderline PD groups were significant for the Demanding Parent and the Healthy Adult and the contrasts between the antisocial PD and cluster C groups were significant for 7 out of 14 modes (the Impulsive Child, the Compliant Surrender, the Detached Self-Soother, the Self-Aggrandizer, the Bully and Attack, the Demanding Parent and the Healthy Adult modes).

Table 1: Means and standard deviations of all self- and other-reported modes scores for antisocial PD, borderline PD and cluster C PD groups (N=96).

Schema modes	Antisocial PD (n=19)		Borderline PD (n=49)		Cluster C PD (n=28)	
	Self (SD)	Other (SD)	Self (SD)	Other (SD)	Self (SD)	Other (SD)
VC	2.19 (.86)	3.55 (1.02)	3.81 (1.03)	3.78 (.84)	3.65 (.88)	3.81 (.74)
AC	2.46 (.99)	3.94 (.83)	3.56 (.98)	3.68 (.79)	3.53 (1.01)	3.54 (.81)
EC	2.06 (.60)	2.98 (.90)	2.60 (1.11)	2.92 (.89)	1.72 (.68)	1.94 (.67)
IC	2.77 (.74)	3.70 (.82)	3.76 (.91)	3.46 (.75)	2.56 (.58)	2.49 (.82)
UC	2.52 (.63)	3.77 (.99)	3.62 (.98)	3.41 (.74)	2.91 (.92)	3.07 (.66)
HC	3.70 (.74)	3.33 (.90)	2.96 (.78)	3.01 (.69)	3.15 (.79)	2.96 (.70)
CS	2.25 (.82)	3.02 (.98)	3.75 (.87)	3.78 (.96)	3.93 (.84)	4.09 (.62)
DPt	1.96 (.89)	3.42 (.86)	3.58 (.86)	3.49 (.87)	3.06 (.75)	3.08 (.69)
DSS	2.35 (.89)	3.85 (1.01)	3.67 (.90)	3.41 (.94)	2.90 (.77)	2.52 (.72)
SA	1.65 (.67)	2.85 (1.14)	1.75 (.69)	2.18 (.82)	1.33 (.51)	1.87 (.73)
BA	2.40 (.73)	3.20 (.86)	2.24 (.72)	2.74 (.89)	1.93 (.62)	1.86 (.67)
PP	2.04 (.93)	2.98 (.71)	2.98 (1.05)	3.10 (.51)	2.80 (.84)	3.19 (.68)
DP	2.50 (.94)	2.71 (1.21)	3.87 (.85)	3.58 (1.01)	4.25 (.94)	4.20 (.91)
HA	4.17 (.98)	3.91 (.91)	2.96 (.94)	3.05 (.75)	2.95 (.93)	2.92 (.66)

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult

Table 2: Simple contrasts between the therapists` schema modes ratings of the antisocial, borderline and cluster C PD groups for the complete sample and for males only

Schema modes	Overall sample				Male sample			
	Antisocial vs borderline		Antisocial vs cluster C		Antisocial vs borderline		Antisocial vs cluster C	
	t	p	t	p	t	p	t	p
VC	-.74	.46	-.99	.32	-.65	.52	-.59	.56
AC	1.45	.15	1.58	.12	1.60	.12	.32	.75
EC	.14	.87	3.98**	<.001	.64	.32	1.93	.06
IC	1.08	.28	4.99**	<.001	1.66	.11	4.23**	<.001
UC	2.07*	.04	3.35*	.001	.62	.54	1.07	.29
HC	1.62	.11	1.79	.08	.14	.89	1.42	.17
CS	-3.16*	.002	-3.92**	<.001	-1.10	.28	-2.37*	.03
DPt	-.61	.54	1.07	.29	-.15	.89	.97	.34
DSS	1.58	.12	4.71**	<.001	1.24	.23	3.79*	.001
SA	2.86*	.005	3.85**	<.001	.84	.41	2.67*	.01
BA	2.29*	.03	5.65**	<.001	1.19	.24	3.23*	.003
PP	-.008	.93	-.72	.47	-.55	.59	-.22	.83
DP	-3.11*	.003	-5.10**	<.001	-2.03*	.05	-2.90*	.006
HA	4.45**	<.001	4.60**	<.001	2.30*	.03	2.79*	.008

Note: VC = Vulnerable Child; AC = Angry Child; EC = Enraged Child; IC = Impulsive Child; UC = Undisciplined Child; HC = Happy Child; CS = Compliant Surrender; DPt = Detached Protector; DSS = Detached Self-soother; SA = Self-Aggrandiser; BA = Bully and Attack; PP = Punitive Parent; DP = Demanding Parent; HA = Healthy Adult; * p<.05; **p<.001

Patient versus therapist ratings

Repeated measures analyses revealed a significant three-way interaction for self-other report x modes x group for the maladaptive modes, $F(22, 86) = 2.49$, $p = .001$, but not for the adaptive modes, $F(2,89) = .20$, $p = .82$. Results of the t-tests assessing whether self- and other-report differed significantly, are presented in table 3 for each group. In the antisocial PD group, self- and other reported modes differed significantly in 11 out of 14 modes (all maladaptive modes but the Demanding Parent). In all of these cases, antisocial patients indicated a significantly lower presence of these modes than their therapists did. In the borderline group, this difference was only significant in three modes. More specifically, borderline patients reported a lower presence than their therapists of the Enraged Child, the Self-Aggrandizer and

the Bully and Attack modes. In the cluster C group, self-and other report also differed significantly for three maladaptive modes; they scored lower than their therapists on the modes of the Self-Aggrandizer and Punitive Parent and higher than their therapists on the Detached Self-Soother mode.

Simple contrast analysis (see table 3) yielded a significant contrast for the self- and other- mode discrepancy between the antisocial PD group and the borderline PD group for all maladaptive modes except for the Bully and Attack and Demanding Parent modes. The contrast between the antisocial PD group and the cluster C group in self-other discrepancy was significant for all modes except for the Compliant Surrender, Punitive Parent and Demanding Parent modes. The contrast for the adaptive modes was not significant between any of the groups. This indicates that the discrepancy between self- and other-reported modes was stronger in the antisocial group compared to the borderline and cluster C group for almost all maladaptive modes.

Table 3: Paired-sample t-tests comparing self- and other- report for antisocial PD, borderline PD and cluster C PD groups (N=96).

Schema modes	Antisocial PD (n=19)			Borderline PD (n=49)				Cluster C PD (n=28)			
	Difference[a]	t	p	Difference[a]	t	p	Contrast ASPD: t (p)	Difference[a]	t	p	Contrast ASPD: t (p)
Vulnarable Child	-1.48**	-5.80	<.001	-.02	-.16	.87	5.57** (<.001)	-.16	-1.03	.31	4.38** (<.001)
Angry Child	-1.55**	-5.66	<.001	-.14	-.87	.39	4.10** (<.001)	-.01	-.06	.96	4.08** (<.001)
Enraged Child	-.91**	-3.87	.001	-.35*	-2.20	.03	2.07* (.04)	-.22	-1.44	.16	2.21* (.03)
Impulsive Child	-.95**	-4.01	.001	.24	1.49	.14	4.24** (.001)	.06	.36	.73	3.15* (.002)
Undisciplined Child	-1.31**	-4.82	<.001	.17	1.13	.27	4.86** (<.001)	-.16	-.86	.40	3.36** (.001)
Happy Child	.37	1.50	.15	-.05	-.41	.68	-1.52 (.13)	.19	1.05	.30	-.55 (.58)
Compliant Surrender	-.74*	-2.57	.02	-.03	-.18	.86	2.41* (.02)	-.17	-1.09	.29	1.82 (.07)
Detached Protector	-1.37**	-6.41	<.001	.03	.19	.85	5.60** (<.001)	-.02	-.10	.92	4.78** (<.001)
Detached Self-soother	-1.50*	-3.83	.002	.21	1.35	.18	5.47** (<.001)	.38*	2.26	.03	5.38** (<.001)
Self-Aggrandiser	-1.21**	-4.80	<.001	-.49**	-3.53	.001	2.89* (.005)	-.54*	-3.00	.006	2.29* (.02)
Bully and Attack	-.90**	-4.46	<.001	-.51*	-3.12	.003	1.03 (.31)	.06	.41	.68	2.69* (.007)
Punative Parent	-.98**	-4.14	.001	-.11	-.78	.44	2.88* (.005)	-.38*	-2.08	.05	1.78* (.01)
Demanding Parent	-.05	-.18	.86	.29	1.90	.06	1.72 (.09)	.05	.27	.79	.82 (.42)
Healthy Adult	.26	1.02	.32	-.09	-.62	.54	-1.28 (.21)	.03	.16	.88	-.69 (.49)

Note: * p<.05; **p<.001.: [a] A positive difference score indicates that the therapist indicated a higher presence than the patient, a negative difference score indicates that the patient indicated a higher presence than the therapist.

Analyses of the male sample only (see table 4) revealed that the contrasts between the antisocial PD group and the borderline PD group disappeared for the Enraged Child mode, and the contrast between the antisocial PD and the cluster C group disappeared for the Enraged Child, the Self-Aggrandizer and the Punitive Parent modes. This possibly indicates that these four contrasts cannot be attributed to group differences, but to the male gender, although there might be a type II error given that differences remained comparable and loss of significance was mainly due to smaller samples. Taken together, the results on the contrasts in self-versus other report of modes with the antisocial PD group indicate that, the possible gender confounding taken into account, the contrasts between the antisocial PD and borderline PD groups were significant for 9 out of 12 maladaptive modes (all except the Enraged Child, Bully and Attack and Demanding Parent modes) and the contrasts between the antisocial PD and cluster C groups were significant for 7 out of 12 maladaptive modes (all but the Enraged Child, Compliant Surrender, Self-Aggrandizer, the Punitive Parent and the Demanding Parent modes).

Table 4: Contrasts between antisocial PD and borderline PD and between antisocial PD and cluster C PD in males (N=38).

Schema modes	Antisocial vs borderline			Antisocial vs cluster C		
	MD[a]	t	p	MD[a]	t	p
Vulnerable Child	1.95**	5.09	<.001	1.40*	3.41	.002
Angry child	1.68**	3.70	.001	1.05*	2.13	.04
Enraged Child	.87	1.88	.07	.66	1.31	.20
Impulsive Child	1.69**	4.12	<.001	1.37*	3.12	.004
Undisciplined Child	1.92**	4.33	<.001	1.11*	2.32	.03
Happy Child	-.34	-.83	.42	-.18	-.42	.68
Compliant Surrender	1.24*	2.99	.005	.16	.35	.73
Detached Protector	1.81**	5.15	<.001	2.12**	5.62	<.001
Detached Self-Soother	2.07**	3.87	.001	2.21**	3.85	.001
Self-Aggrandizer	.81*	2.22	.03	.51	1.28	.21
Bully and Attack	.37	.93	.39	1.11*	2.43	.02
Punitive Parent	.92*	2.40	.02	.02	.006	.96
Demanding Parent	.45	1.05	.30	.007	.02	.99
Healthy Adult	-.16	-.39	.99	.41	.92	.36

Note: * p<.05; **p<.001.: [a]A positive score indicates that the contrast was higher for the antisocial group than for the contrast group, a negative score indicates that the contrast was lower for the antisocial group than for the contrast group.

Influence of psychopathy

Pearson correlations between the total psychopathy score and the patient-therapist mode report differences revealed a significant positive correlation with the Demanding Parent mode, p=.04. The PCL-r lifestyle facet (3) had a significant positive relationship with the difference score in Healthy Adult, p=.04. None of the other association between the PCL-r total scale and the modes were significant, p`s>.11, nor were the correlations between PLC-r factor 1 or factor 2, $p$`s >.07, or facet 1 to 4, p`s>.06, and the differences scores of any of the modes.

DISCUSSION

In line with our expectation, patients with an antisocial PD rated the presence of most of their maladaptive modes markedly lower compared to their therapists. This discrepant pattern was only observed for some of the modes in the borderline and cluster C group. Furthermore, the patient-therapist discrepancy was significantly stronger in the antisocial group than in the two PD control groups. This strong discrepancy in maladaptive mode rating of the antisocials and their therapists can be interpreted at least in four ways. First, antisocial patients may deliberately deny the presence of their maladaptive modes. On the one hand, this explanation is likeable since lying and denying are central diagnostic criteria of antisocial PD. On the other hand however, since the mode rating of the patients in this study was only used for research goals it is unclear what antisocial patients would gain from underreporting these maladaptive modes. Secondly, antisocials could lack insight into their psychopathology. Although PD patients in general are described as lacking insight into their pathology due to the ego-syntonic nature of PDs, the current results might indicate that antisocial patients in particular may have even less insight into their pathology than other PD patients have. Third, antisocials may genuinely believe that they have less pathology which could reflect a bias in their self-image. Fourth, the mode patient-therapist discrepancy could reflect an overestimation of the strength of the maladaptive modes by the therapists of the antisocial patients. Although one could argue that therapists should be able to give a more objective estimation of mode presence due to their professional status, it is possible that therapists are e.g. frustrated or discontent by poor therapy progress with these patients, and therefore do not rate the presence of these modes accurately.

Irrespective of the reason of the lower scores of maladaptive modes of the antisocials, low scores on self-reported questionnaires of antisocial PD patients should alert forensic mental health professionals. Clearly, relying solely on self-report methods of assessment produces a limited and probably ameliorated view of antisocial patients` mental status. These data clearly indicate the importance of including collateral information besides self-report when it concerns antisocial patients. While previous studies already indicated the importance of collateral information in the diagnostic phase of therapy, this study indicates this is also necessary in the assessment of cognitive concepts like schema modes.

Contrary to our expectations, the patients` and therapists` ratings of the adaptive modes (i.e. the Healthy Adult and the Happy Child) did not differ significantly in any of the groups. This finding, together with the finding of a stronger Healthy Adult mode rating of the therapists of the antisocial PD group than

the other groups, could indicate that the high level of adaptive modes in antisocials cannot be solely ascribed to a response bias of the antisocial patients. It is quite possible that although antisocial PD is an extreme form of psychopathology, antisocial patients might be in part healthy. Although it has been proven that antisocials have very distorted cognitions regarding certain specific themes (e.g. like their evaluative attributes to morally good or bad or to violence (Cima, Tonnaer, & Lobbestael, 2007; Gray, Brown, MacCulloch, Smith, & Snowden, 2005), these distortions may reflect rather isolated problem areas that might exist next to healthy views on other areas in their life.

Psychopathy only had an influence on self versus other rating of the Demanding Parent mode. The higher the total level of psychopathy the higher the patient's rating relative to the therapist rating of the Demanding Parent mode, and the higher the lifestyle facet of psychopathy the higher the patient's rating relative to the therapist rating of the Healthy Adult mode. This indicates that the antisocials high in psychopathy rate themselves as more demanding and strict towards themselves than their therapists do, and patients scoring high on lifestyle facets rate themselves as more healthy than their therapists do. The latter finding implicates that especially antisocial patients with a high level of e.g. impulsivity and irresponsibility rate themselves as more healthy than their therapists do.

This study has several advantages. First, both PD pathology and mode presence were measured by means of valid instruments. Second, in many studies informants are selected by the subject themselves and were friends, significant others or relatives of the subject. This might be described as a `letter of recommendation` problem, instead of an accurate, objective appraisal of the subject's personality disorder traits (Klonsky, Oltmanns, & Turkheimer, 2002). By using therapists as informants in the current study, it can be assumed this was avoided since the relationship between a patient and his/her therapist is primary a professional one.

Some drawbacks of the current study should be acknowledged. First, sample size was relatively small. Nonetheless, the diagnostic groups were carefully recruited and therefore homogeneous and representative. Second, only male antisocial patients were included. While this is not a-typical since some 80% of the antisocial population is male, the current data cannot be generalized to a female antisocial population. Third, the current study only included one other-informant. It would be interesting to test the agreement on modes between patients, therapists and intimates of the patients.

This study was the first to assess differences between patient- and therapist reported presence of schema modes in a PD sample. In conclusion, the present study demonstrated that ASPD patients tend to underreport dysfunctional cognitive constructs, whereas patients with other PDs do this to a much lesser extent. Consequently, self-report by antisocial patients might be misleading and the use of alternative assessment methods for cognitive concepts is advisable.

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PART 2

CHILDHOOD TRAUMA

Chapter 7

Development and psychometric evaluation of a new assessment method for childhood trauma: the Interview for Traumatic Events in Childhood (ITEC).

Lobbestael, J., Arntz, A., Harkema-Schouten, P. & Bernstein, D. (2008). Development and psychometric evaluation of a new assessment method for childhood trauma: the Interview for Traumatic Events in Childhood (ITEC). *Child Abuse and Neglect.* Accepted pending revision.

ABSTRACT

We conducted a comprehensive assessment of the reliability and validity of the Interview for Traumatic Events in Childhood (ITEC, Lobbestael, Arntz, Kremers, & Sieswerda, 2006), a retrospective, semi-structured interview for childhood trauma. Initial psychometric properties were tested with the pilot version of the ITEC in n=362 participants. A second study assessed the revised ITEC, using n=217 participants. Factor analyses of the victimization items produced the best fit for a 5-factor model (sexual, physical and emotional abuse, physical and emotional neglect). The scales showed good internal consistency and excellent inter-rater reliability. The scales were highly associated with equivalent scales of the Childhood Trauma Questionnaire (i.e., good convergent validity), and showed good correspondence with patient file information (i.e., good criterion validity). These results support the reliability and validity of the ITEC, making it a potentially useful tool for assessing a broad range of traumatic events in childhood.

INTRODUCTION

During the last decades, numerous studies have examined the effects of childhood trauma, mainly using retrospective assessments of traumatic experiences. While many early studies used retrospective trauma methods of unknown reliability and validity, several promising trauma assessment instruments have subsequently been developed, and initial findings on their reliability and validity have been reported. The most thoroughly validated and widely used retrospective trauma instrument is the Childhood Trauma Questionnaire, a self-report questionnaire that measures 3 types of abuse (i.e., physical, sexual, and emotional), and 2 types of neglect (i.e., physical and emotional) (CTQ; Bernstein, Ahlualia, Pogge, & Handelsman, 1997; Bernstein & Fink, 1998; Bernstein, Stein, Newcomb, Walker, Pogge et al., 2003). Studies in clinical and community based samples have consistently supported the reliability and validity of the CTQ, including replications of its 5-factor structure (Bernstein et al., 2003; Scher, Stein, Admundson, McCreary, Forde et al., 2001), convergent and discriminant validity with other trauma instruments (Bernstein et al., 1997), and criterion-validity with independently-corroborated trauma ratings (Bernstein et al., 1997; Bernstein et al., 2003).

Although questionnaires like the CTQ have the advantage of being quickly and easily administered and scored, they are limited in comparison to retrospective trauma interviews, which can provide a richer and more detailed description of early traumatic experiences. Trauma interviews provide the opportunity to probe and clarify traumatic events. The interviewer can assess whether the experienced events can be labeled as abusive in light of an objective definition of trauma, reducing the variability caused by the interpretation of the interviewee. Interviews can include follow-up questions, for example, to fill in details about the identity of the perpetrator, age of onset and duration of the maltreatment, and specific characteristics of the abusive acts themselves. Thus, while interviews are more labor intensive than questionnaires, they provide some distinct advantages that questionnaires lack.

Several retrospective interviews for childhood trauma have been reported in the literature, including a few whose initial psychometric properties are encouraging e.g., the Experience of Care and Abuse (Bifulco, Brown, & Harris, 1993), and the Childhood Trauma Interview (Fink, Bernstein, Handelsman, Foote, & Lovejoy, 1995). However, these interviews lack extensive validation.

In the current report, we present extensive data regarding the reliability and validity of the Interview for Traumatic Events in Childhood (ITEC). The ITEC is a retrospective trauma interview developed by our group that has already been used in several published studies examining the relationship between childhood trauma and psychopathology (Arntz, Dietzel, & Dreessen 1999; Giesen-Bloo & Arntz, 2005; Lobbestael, Arntz & Sieswerda, 2005; Kremers, Van Giezen, Van der Does, van Dyck, & Spinhoven, 2007). Good test-retest reliability of the ITEC has been demonstrated by Kremers et al. (2007) in patients with borderline personality disorder who were assessed before and after treatment (mean inter-test interval = 27 months). The design of the first version of the ITEC improves upon that of many earlier trauma interviews in several ways: (1) Four types of childhood trauma are assessed – sexual abuse, physical abuse, emotional abuse, and neglect -- each type operationalized by clear definitions; (2) Both experiencing and witnessing these types of trauma is measured; (3) The ITEC obtains detailed information regarding parameters of childhood maltreatment, namely specification of acts, perpetrators, age of onset, duration of maltreatment, and impact of the maltreatment on the subject in the past and in the present; (4) Each subscale yields a composite score indicating the severity of the trauma; (5) Severity of abusive acts are based on ratings by a large group of therapists and by a sample of respondents from the open population, yielding more objective estimates of severity; and (6) the ITEC determines whether experienced events correspond to objective definitions of abuse; it does not label these events a priori as abusive (i.e., by using questions that include the term “abuse” or other similar terms). In this way, subjective appraisal of abuse is avoided, minimizing the chance of an interpretation bias by the respondent (Engelhard, van den Hout, & Schouten, 2007).

In this report, we first describe a study assessing the factorial structure of the first version of the ITEC (study I). The aim of the second study was to provide a more extended psychometric assessment of the second version of the ITEC (study II).

STUDY I

METHOD

Participants

The pilot ITEC was administered to 362 adults, including patients from several psychiatric and forensic mental health care institutes and prisons in the Netherlands and Belgium, and non-patient controls. Of this group, 56.5% were female and 43.5% male, with a mean age of 37.4 years (SD = 10.84, range = 18 – 59). With respect to educational level, 0.4% received no education, 12.3% only completed primary school and 44.8% high school or low-level vocational studies, while 19% completed a secondary education, and 23.4% a higher education.

Two hundred seven of the 362 participants had data available concerning Axis I and II disorders. Within this group, 28.5% (n = 59) received no diagnosis on Axis I. The remaining participants received one or more Axis I diagnoses of anxiety disorders (40.6%), mood disorders (40.1%), eating disorders (7.2%), and substance abuse or dependence (7.2%), and other mental disorders (< 3%). Thirty eight percent (n = 79) received no diagnosis on Axis II. The remaining 61.4% received one or more Axis II diagnoses of borderline (33.8%), avoidant (20.3%), depressive (16.4%), obsessive-compulsive (14%), antisocial (7.2%), dependent (4.3%), paranoid (4.3%), and other personality disorders (< 3%).

Measures

SCID-I and SCID-II

Dutch versions of the Structured Clinical Interview for DSM-IV Axis I and Axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon, Williams, Benjamin, et al. 1994; First, Spitzer, Gibbon, & Williams, 1997; van Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999; Weertman, Arntz, & Kerkhofs, 2000) were used to assess DSM-IV Axis I diagnoses and personality pathology. Inter-rater reliability of the SCID I proved to be adequate (Martin, Pollock, Bukstein & Lynch, 2000; Zanarini, Skodol, Bender, Dolan, Sanislow, et al. 2000; Zanarini & Frankenburg 2001). In a test-retest study, satisfactory interrater reliabilities were found for SCID II (median ICC for trait scores of seven PDs = 0.66; Weertman, Arntz, Dreessen, van Velzen, & Vertommen, 2003). Furthermore, the study by Maffei, Fossati, Agostoni, Barraco, Bagnato et al. (1997) reported interrater reliability coefficients of the SCID II ranged from .48 to .98 for categorical diagnoses (Cohens`s K), and from .90 to .98 for dimensional judgements (ICC), while internal consistency of the trait scales were satisfactory (.71-.94). Of the current sample, 97 interviews were rated twice (by means of audio taping the original interview), and yielded high interrater reliabilities values (ICC between .76 and .98, with a mean of .92). Interviewers were extensively trained and supervised by the first or second author.

Interview for Traumatic Events in Childhood (ITEC) – pilot version

The pilot ITEC was designed to assess three forms of childhood maltreatment prior to the age of 18: sexual, physical and emotional abuse/neglect. These scales were based on the following definitions (partly derived from Bernstein, et al. 2003; Johnson, Shea, Yen, Battle, Zlotnick et al. 2003). Childhood sexual abuse (7 items) was defined as attempted or actual sexual contact between a child younger than 18 years and an adult or older person, against the child's will; childhood physical abuse (13 items) as bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury; childhood emotional abuse/ neglect (13 items) as humiliating or demeaning behaviour directed toward a child by an adult or the failure of caretakers to meet children's basic emotional and physical needs.

The items assessing sexual abuse were preceded by the screening question "Have you ever been pressured or forced into sexual contact against your wishes?". The other categories were not introduced by screening questions. The items used neutral, non-pejorative language to inquire about childhood trauma, to avoid biasing respondents' responses. For each category to which the interviewees responded positively, follow-up questions were used to gather detailed information about perpetrators; age of onset, frequency, and duration of trauma; and the impact on the victims in the past and in the present. On average, the administration time of the pilot ITEC was about 20 minutes.

Procedure

After a full explanation of the research procedure, written informed consent was obtained from all participants. Most participants were diagnosed by means of SCID I and SCID II before the pilot ITEC was administered; in other cases, diagnostic information was already available from patients' clinical records. The studies involving acquisition of the data were approved by the University of Maastricht's Medical Ethical Committee.

Statistical analyses

The fit of 3 confirmatory factor models was tested in the entire sample of 362 adult patients and non-patients: (1) the original scaling of the pilot ITEC with the 3 subscales of sexual, physical and emotional abuse/neglect, (2) a model in which the neglect items were set apart from the emotional abuse scale, leading to 4 factors of sexual abuse, physical abuse, emotional abuse and neglect, and (3) a further division of the neglect scale into emotional and physical neglect producing a 5-factor model identical to the structure of the Childhood Trauma Questionnaire (Bernstein et al. 2003) with sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect as subscales. Items for these analyses were scored un-weighted as either present or absent. Factor structures were tested by means of confirmative factor analyses (CFA), employing structural equation modelling (SEM, LISREL software 8.54, Jöreskog & Sörbom 2001). Missing data were estimated by means of missing value analyses. The goodness-of-fit was evaluated using the comparative fit index (CFI), the Standardized Root Mean Square Residual (SRMR), and the χ^2 in combination with the degrees of freedom. A CFI value above .90 and an SRMR value below .08 were considered indicative of a good fit.

Internal consistency reliability of the pilot ITEC subscales was assessed by Cronbach`s Alpha. Values above .90 were interpreted as excellent, >.70 as good, and >.60 as fair. Correlations between the subscales are described using SEM Pearson correlations corrected for attenuation.

RESULTS AND DISCUSSION

Factor structure

Table 1 provides the goodness-of-fit indices for the three models. For all models, the CFI is well above .90, and SRMR values lower than .08, indicating excellent fits. Testing of the Chi-square values and the associated degrees of freedom revealed a significant p-value, indicating that the 5-factor model provided a better fit than the 3- and 4-factor solutions. These data indicate it is preferable to separate emotional neglect and physical neglect from the emotional abuse/neglect scale, leading to a 5-factor model of sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect.

Table 1: Goodness-of-fit indices of the pilot ITEC.

Model	Number of factors	CFI	SRMR	χ^2 (df)
SA PA EAN	3	.95	.07	1390.86 (492)
SA PA EA N	4	.95	.06	1303.77 (489)
SA PA EA EN PN	5	.95	.06	1248.47 (485)*

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-square; df = degrees of freedom; SA= sexual abuse; PA= physical abuse; EAN= emotional abuse/neglect; N= neglect; EN= emotional neglect; PN= physical neglect. * this model is significantly better than the other models at the p<.001 level

Internal consistency reliability and correlations between subscales

Cronbach's alpha values for the pilot ITEC subscales were good for sexual abuse (α = .84), physical abuse (α = .87), emotional abuse (α = .84) and emotional neglect scale (α = .76), and fair for the physical neglect scale (α = .60).

Inter-correlations between the pilot ITEC subscales indicate low to moderate correlations between the abuse scales, ranging from .35 to .83, median = .54. The highest correlation was found between the emotional abuse scale and the emotional neglect scale (r=.83). The fact that the confidence interval ($\pm$ 2 * SE; Anderson & Gerbing 1988) around the correlation estimates between these two subscales did not include 1.0, indicates emotional abuse and emotional neglect do represent distinct constructs.

The pilot study supported the initial reliability and validity of the original version of the ITEC, and suggested that the ITEC has a 5-factor structure similar to that of the CTQ (Bernstein et al., 2003). However, during the administration of the pilot ITEC, some participants reported abusive events and perpetrators that were not specified in the pilot ITEC.

STUDY II

INTRODUCTION

For study II, a new version of the ITEC was constructed. In this second version, several new events and perpetrators of childhood trauma were added. Moreover, in line with previous studies that stressed the importance of witnessing abusive events in the development of psychopathology (Glodich 1998; Luster, Small, & Lower, 2002), witnessing abusive items were added to the ITEC subscales. Finally, scoring of age, duration, perpetrators and impact (past an current) was now required for each abusive event so that the ITEC could provide weighted severity scores for each abusive item, as opposed to the pilot ITEC which only provided un-weighted severity scores. The aim of this second study was to conduct a thorough assessment of the reliability and validity of the ITEC. First, it had to be determined which factor structure provided the best fit for this new ITEC version, and whether the 5-factor structure of the pilot ITEC could be replicated. Each model fit was tested on two weighted severity calculations: the summing of the objective severity items (i.e. event, perpetrator, age and duration) and the summing of the subjective severity items (i.e. current and past impact of the event). The reason for this is that the aim of this study was to construct a weighted severity index that is as objective as possible. Therefore, we tested whether using objective severity parameters was indeed preferable to using subjective severity indices. Secondly, internal consistency reliability was assessed, as well as inter-rater reliability (the third research goal) and convergent validity with the CTQ, a retrospective trauma questionnaire with well-established psychometric properties (Bernstein et al., 2003) (the fourth research goal). Fifthly, criterion-related validity was determined by comparing the ITEC with file information about patients' maltreatment histories. To our knowledge, this is the first validation study of a trauma interview for childhood events to examine so many different aspects of reliability and validity.

METHOD

Participants

The revised ITEC (further merely referred to as the ITEC) was administered to 217 adults, including 178 patients from several ambulatory and forensic mental health care institutions in the Netherlands, and 39 non-patients. Of this group, 71.3% was female and 26.9% male, with a mean age of 33.75 years (SD = 10.54, range = 18 – 61). With respect to educational level, 0.9% received no education, 7.9% completed only primary school, 30.1% high school or low-level vocational studies, while 35.2% completed a secondary education, and 22.3% a higher education.

Axis I diagnoses were available for 204 of the 217 participants. Forty-three percent of this group received anxiety disorders diagnoses, 32.4% had mood disorders, 21.8% substance abuse or dependence disorders, 8.8% eating disorders, and 6.5% somatoform disorders. Axis II data were available for 202

participants. Within this group, 30.1% had borderline, 18.1% avoidant, 13.9% obsessive-compulsive, 12% depressive, 7.9% antisocial, 6% dependent, 6% passive-aggressive and 6% schizoid personality disorder. Other Axis II disorders were diagnosed in 3% or less of the participants.

Measures

SCID-I and SCID-II

Diagnostic instruments for Study 2 were the same as for Study 1 (see above).

Interview for Traumatic Events in Childhood (ITEC)

The revised version of the ITEC consisted of the original ITEC items and 8 new items: 3 for sexual abuse, 3 for emotional abuse, and 2 for emotional neglect. Based on the factor analytic results from the pilot study (see above), items for physical neglect and emotional neglect items were assigned to separate subscales, apart from the emotional abuse items. Thus, the revised ITEC consisted of 5 victimization subscales: physical, sexual, and emotional abuse, and physical and emotional neglect. In addition to the victimization scales, parallel scales were created for witnessing the various forms of abuse and neglect. The ITEC witnessing items had the same answer format as the victim items, with an additional item to determine the primary victim of the abusive acts. No other changes were made to the ITEC's format. All of the ITEC's items are described in table 2.

Childhood Trauma Questionnaire, short form (CTQ-SF)

The Dutch version of the CTQ-SF (Arntz & Wessel 1996; Bernstein & Fink 1998; Bernstein, et al. 2003) asks about experiences in childhood and adolescence. Each of the 28 items begins with the phrase ``When I was growing up ...`` and is rated on a 5-point Likert frequency scale with response options ranging from `never true` to `very often true`. The CTQ has five empirically derived scales: physical, sexual and emotional abuse and physical and emotional neglect. Each type of maltreatment is represented by five items. The CTQ also has a three-item minimization/denial validity scale that was developed to detect the underreporting of maltreatment. Studies have demonstrated the measurement invariance of the CTQ across clinical and community samples, and confirmed the CTQ's 5-factor structure (Bernstein, et al. 2003). All 5 scales showed adequate to good internal consistency reliability (mean α ranging from .69 to .94, Scher, et al. 2001). Self-reports of traumatic events on the CTQ scales are highly stable over time and show good convergent and divergent validity with trauma histories that have been ascertained by other measures, including cases in which child maltreatment can be corroborated with independent evidence (Scher, et al. 2001; Bernstein, et al. 2003).

Table 2: Abusive events in the ITEC, along with their absolute and relative severity scores, prevalence and factor loading for the dichotomous and continuous severity model.

ITEC abusive events per subscale	Severity scores abusive events		Frequency		Item loadings
	Absolute Mean (sd)	Relative Mean	Victim	Witness	
Sexual abuse					
1. forced into sexually sadistically acts (e.g., sadomasochism or sex with animals)	11.05 (1.52)	.92	3.2	-	.46
2. forced into anal intercourse	10.10 (1.48)	.84	2.8	-	.48
3. forced into vaginal intercourse	9.27 (1.59)	.77	13.9	2.3	.66
4. sexual acts in which spectators were present, direct or indirect [1, 2]	8.42 (2.57)	.70	5.6	-	.41
5. sexual acts in which objects were used	8.08 (1.94)	.67	4.6	-	.61
6. sexually satisfying someone by mouth	7.05 (1.65)	.59	9.3	.5	.63
7. being sexually satisfied (by hand or mouth)	5.85 (1.72)	.49	11.6	-	.70
8. blackmailed to remain silent about the sexual acts [1]	5.73 (3.25)	.48	14.8	.9	.71
9. sexually satisfying someone by hand	5.15 (1.67)	.43	16.7	-	.81
10. sexually palpitated	3.43 (1.37)	.29	35.2	1.9	.80
11. forced to observe sexual acts [1, 2]	2.47 (1.32)	.21	6.5	-	.46
12. sexually approached [2]	1.40 (1.15)	.12	24.1	-	.73
Physical abuse					
1. being cut with knife or other sharp object	12.17 (1.04)	.94	4.2	1.9	.34
2. taken by the throat	11.12 (1.98)	.86	14.4	4.6	.60
3. caused burns by someone	10.93 (1.71)	.84	3.2	-	.36
4. hit with a stick or other object	9.03 (1.88)	.69	16.2	6.5	.60
5. tied with a rope or locked up	8.75 (2.90)	.67	13.9	4.2	.62
6. being punched	7.88 (1.77)	.60	28.2	10.6	.80
7. being kicked	6.77 (2.21)	.52	32.4	10.2	.77
8. dragged along the ground	5.42 (2.16)	.42	19.4	5.1	.77
9. clothes ripped of the body	5 (2.39)	.38	10.2	.9	.46
10. being hit	4.77 (2.14)	.37	56.9	19.4	.65
11. pulled by hair	3.58 (1.51)	.28	33.8	6.5	.64
12. threatened with a physical abusive act	3.12 (3.16)	.24	21.8	5.1	.59
13. something thrown at	2.5 (1.56)	.19	26.4	5.6	.56

Emotional Abuse					
1. forced to protect yourself from family members [1]	7.30 (2)	.81	19.4	6	.65
2. wrongfully or cruelly punished	7.15 (1.99)	.79	24.1	5.1	.59
3. nagged, belittled or called names	6.10 (1.47)	.68	58.8	11.6	.63
4. not being aloud to express feeling or needs, or being punished if you did	5.57 (2.10)	.62	39.4	8.8	.63
5. an object you liked was destructed	5.37 (2.34)	.60	26.4	3.7	.57
6. hurtful or insulting things were said	4.87 (1.91)	.54	59.3	9.7	.69
7. threatened with words	3.93 (1.96)	.44	38.4	7.4	.71
8. many arguments between family members [1,2]	2.45 (1.83)	.27	51.9	-	.50
9. many problems with the police in the family [1,2]	2.27 (1.74)	.25	7.4	-	.29
Emotional neglect					
1. received no warmth or love	6.18 (1.33)	.88	36.1	-	.71
2. left to your own device [2]	5.27 (1.37)	.75	23.6	6.9	.67
3. no one in the family who took your defense [1]	4.51 (1.61)	.64	25.5	-	.62
4. parents addicted to alcohol or drugs [2]	4.29 (1.78)	.61	24.1	2.3	.47
5. take care of parents or other family members	3.33 (1.65)	.48	29.6	-	.49
6. left alone a lot [2]	3.19 (1.29)	.46	17.6	2.8	.43
7. no clear agreements or responsibilities [1, 2]	1.98 (1.43)	.28	13.9	-	.41
Physical neglect					
1 having too little to eat	1.24 (.48)	.62	3.7	.9	.65
2. having to wear dirty or torn clothes	.55 (.37)	.28	4.2	1.9	.63

Note: item loading are only presented for witnessing physical abuse and witnessing emotional abuse since baseline levels of the other witness items were too low and therefore not could included as separate items in further analyses; [1] these items were not included in the pilot version of the ITEC; [2] these items do not have a witness variant

Procedure

After participants gave informed consent, they were administered the SCID-I and SCID-II, the ITEC (revised version), and the CTQ-SF. Twenty ITEC interviews were taped, and then rescored by a second rater for reliability purposes. Fifty-one patient files were screened for indices of maltreatment for determining the criterion validity of the ITEC.

In order to objectively estimate the severity of abusive acts and perpetrators, 60 raters (30 therapists and 30 respondents from the community) were asked to rank the severity of the abusive acts per kind of abuse on a scale ranging from `least severe abusive act` to `most severe abusive act,` and the severity of the perpetrators on a scale ranging from `least severe perpetrator` to `most severe perpetrator`. Respondents had to make a forced choice ranging from 1 to the highest number of abusive acts in that kind of abuse or perpetrator. Intra-class correlations (ICC) were calculated for each form of abuse and for all perpetrators. ICC values for the average rating of abusive events were excellent (sexual abuse: $ICC = .99$; physical abuse: $ICC = .99$; emotional abuse: $ICC = .98$; neglect: $ICC = .98$; mean $ICC = .99$), as well as the ICC value for the perpetrators ($ICC = .99$). Since we wish to generate severity scores that are reflective of both rater groups, scores of both rater groups were averaged. Severity scores of acts and perpetrators were calculated by dividing the mean scores (the absolute mean) by the total number of abusive acts in that category or perpetrators (the relative mean). This way, a score between 0 and 1 was yielded (see table 2 and 3). This was done in order to acquire similar scoring ranges for all severity parameters and to give them equal weight. Furthermore, maltreatment that started at the youngest age (between 0 and 6 years), lasted the longest (10 years or longer), had the most impact at that time (`very severe`), and even more impact later in life, received the highest severity scores, while their opposites (age between 12 and 18 years, a duration shorter than 1 year, `no impact` at that time and `less impact later in life`) received the lowest severity scores. Depending on how much abuse and neglect is revealed during the interview, the administration time of the new version of the ITEC is between 20 and 30 minutes. Frequency percentages for all abusive acts are given in table 2.

Table 3: Mean scores and ranking of perpetrators.

Perpetrators	Absolute mean (sd)	Relative mean
Mother	24.28 (.80)	.97
Father	24.25 (.70)	.97
Stepfather	19.13 (3.89)	.77
Stepmother	19.08 (3.92)	.76
Brother	18.77 (3.13)	.75
Sister	18.53 (3.11)	.74
Grandmother	18.28 (2.73)	.73
Grandfather	18.17 (2.64)	.73
Several persons	16.73 (6.69)	.67
Partner	15.87 (6.80)	.63
Confident	13.62 (5.64)	.54
Uncle	12.65 (3.25)	.51
Aunt	12.45 (3.21)	.50
Social worker	11.68 (6.25)	.47
Teacher	10.89 (4.88)	.44
Brother-in-law	9.33 (3.97)	.37
Cousin (male)	9.23 (3.55)	.37
Friend	9.18 (5.45)	.37
Sister-in-law	9.15 (3.59)	.37
Cousin (female)	8.82 (3.58)	.35
Neighbor (female)	6.83 (3.36)	.27
Neighbor (male)	6.70 (3.32)	.27
Acquaintance of parents	5.08 (2.93)	.20
Acquaintance	4.12 (3.10)	.16
Stranger	2.07 (4.47)	.08

Statistical analyses

First, we wanted to determine which factor structure would provide the best fit for the ITEC. Because several items for witnessing abuse (especially witnessing sexual abuse and witnessing neglect) had very low frequencies ($n<5$), all witness items were left out of the factor analyses and CFA was performed using only the victim items. Goodness-of-fit indices of these victimization items of the ITEC were calculated for 3 alternative models (identical to those of the pilot study): (1) the 3-factor model with the subscales of sexual, physical and emotional abuse/neglect, (2) the 4-factor model of sexual abuse, physical abuse, emotional abuse and neglect, and (3) the 5-factor model with sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect as subscales. The fits of these 3 models were tested twice;

once with the weighted severity scores calculated by summing the objective severity items (i.e. event, perpetrator, age and duration), and once with the weighted severity scores calculated by summing the subjective severity items (i.e. current and past impact of the event).

Inter-rater reliability between two raters blind to each other's ratings were calculated by means of Intra Class Correlations (ICC) for dimensional scores, with a two-way-random model, consistency type. For this purpose, 20 interviews were rated twice. Single measures reliabilities were assessed, because we only used a second rater in order to answer this research question, while standard use of the ITEC only requires a single rater. Values of ICC range between -1, which indicates perfect opposite interrater reliability, and 1.0, which represents perfect interrater reliability. According to Altman (1991) ICC values below .20 should be interpreted as poor, between .21 and .40 as fair, between .41 and .60 as moderate, between .61 and .80 as good and above .81 as excellent. Convergent and divergent validity of the ITEC was assessed by calculating the Pearson correlations between the subscales of the ITEC and CTQ.

Criterion related validity was assessed by measuring the degree of agreement between the ITEC results and the information on childhood maltreatment obtained from patient files. These patient files were obtained from a community mental health center, and a forensic clinic, and included both intake and therapy session reports. Since the patient files did not reveal information on emotional and physical neglect separately, these subscales were combined, so that the criterion validity of four subscales was tested: sexual, physical and emotional abuse, and (combined emotional and physical) neglect. Furthermore, since the patient files only contained information on whether a specific abusive act took place or not without further severity specifications, the un-weighted severity scores of the ITEC were compared to the patient file information, in order to optimize comparison. History of maltreatment was routinely assessed at the clinics. A positive history of maltreatment was reported in patient records when maltreatment was present, but a negative history was not always reported when maltreatment was judged to be absent. For our purposes, when maltreatment history was not reported in the files, it was scored as absent. Sensitivity of the ITEC for detecting each of these 4 forms of maltreatment was calculated by dividing the number of patients that scored positively on both the ITEC and on patient file information, by the number of patients that scored positively on patient file information. Because the rates of false negative trauma histories in patient's files were probably high, specificity values were not calculated for this study because they would be misleading. In order to assess whether each form of abuse reported in the ITEC uniquely predicts that same form of abuse as reported in the patient files, logistic regression analyses were executed by means of the enter method with patient file abuse as the dependent variable, and ITEC abuse scores as the independent variables.

RESULTS

Factor structure

To address the first research question 6 models were tested; 3 models composed out of objective severity parameters, and 3 models composed out of subjective severity parameters. Goodness-of-fit indices are presented in table 4 and reveal that, concerning the objective severity model, the 5-factor model provided the best fit because it has the highest CFI (.91), and testing of the Chi-square values and the associated degrees of freedom revealed a significant p-value, indicating this 5-factor model provided a better fit than the 3- and 4-factor solutions. The SRMR values of all subjective severity models exceeded the maximum level of .08, stressing the superiority of the objective severity models. In conclusion, these data reveal the best fit for the 5-factor model with sexual, physical and emotional abuse, and emotional and physical neglect, replicating study 1, and when severity scores are based on objective parameters.

Table 2 shows the item loadings of the ITEC. In this 5-factor model, item loadings range from .34 to .81 with a mean loading of .59. There were no items with a factor loading clearly smaller than .30, indicating that none of the items should be removed from the interview due to low factor loading.

Table 4: Goodness-of-fit indices of the ITEC.

Severity parameters	Model	Number of factors	CFI	SRMR	χ^2 (df)
Objective	SA PA EAN	3	.752	.11	4338.57 (857)
	SA PA EA N	4	.904	.086	2045.06 (854)
	SA PA EA EN PN	5	.905	.086	2018.16 (850)*
Subjective	SA PA EAN	3	.878	.10	2591.27 (857)
	SA PA EA N	4	.884	.10	2511.55 (854)
	SA PA EA EN PN	5	.886	.10	2468.79 (850)*

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-square; df = degrees of freedom; SA= sexual abuse; PA= physical abuse; EAN= emotional abuse/neglect; N= neglect; EN= emotional neglect; PN= physical neglect. * this model is significantly better than the other models at the p<.001 level

Internal reliability and inter-correlations between subscales

Internal reliabilities of the ITEC are presented in table 5. Cronbach`s Alpha range from .58 to .89 with a mean of .79. The reliability for the physical neglect scale is inadequate, while the other scales display good reliability..

Table 5: Internal reliability of the subscales of the ITEC.

ITEC subscales	Alpha value
Sexual abuse	.89
Physical abuse	.88
Emotional abuse	.83
Emotional Neglect	.75
Physical neglect	.58
Mean alpha value	.79

Table 6 depicts the inter-correlations between the ITEC subscales (corrected for attenuation). Correlations between the victim scales are low to moderate and range from .39 to .77, with a mean of .51. In line with the pilot ITEC data, the highest correlations are found between the emotional abuse scale and the emotional neglect scale. Again, since the confidence interval (± 2 * SE; Anderson and Gerbing 1988) around the correlation estimates between these two subscales did not include 1.0, emotional abuse and emotional neglect do represent two distinct constructs.

Table 6: Factor inter-correlations between the ITEC subscales, corrected for attenuation.

ITEC subscales	Sexual Abuse	Physical Abuse	Emotional Abuse	Emotional Neglect	Physical Neglect
Sexual Abuse	1				
Physical Abuse	.39	1			
Emotional Abuse	.41	.74	1		
Emotional Neglect	.52	.52	.77	1	
Physical Neglect	.30	.44	.44	.56	1

Inter-rater reliability

Inter rater reliability (n=20) of the ITEC showed excellent agreement between the raters for most subscales (ICC sexual and physical abuse = 1.00; ICC emotional abuse and neglect = .99; ICC witnessing physical abuse = .88; ICC witnessing emotional abuse = .96) and good agreement for the physical neglect scale (ICC = .72).

Criterion related validity

Childhood history of maltreatment was indicated as positive in the ITEC for 92.16% of the 51 subjects. Table 7 demonstrates the percentage of corresponding and non-corresponding information of the ITEC and the patient files. Correspondence between the ITEC and patient files ranges between 58.82 and 78.48%

(both present summed with both absent). Fifteen to 39.22% of the disagreement between the interview and patients records can be ascribed to maltreatment being detected with the ITEC but not reported in the records. In 1.96 to 9.8% of the cases, maltreatment was mentioned in the patient files, but not detected by the ITEC. Thus, the ITEC detected almost all maltreatment found in the records, but approximately 25% of the maltreatment detected with the ITEC was not mentioned in the patient files. Sensitivity of the ITEC subscales are excellent, ranging from .82 to .96 (see table 7).

Table 7: Agreement in percentage between abuse reportage in the ITEC and in the patient file records.

Abuse	ITEC present, file present	ITEC absent, file absent	ITEC present, file absent	ITEC absent, file present	Percentage agreement[1]	Se
SA	27.5	50.98	15.69	5.88	78.48	.82
PA	52.94	5.88	39.22	1.96	58.82	.96
EA	56.86	3.92	33.33	5.88	60.78	.91
N	47.06	23.53	19.61	9.8	70.59	.83

Note: SA = sexual abuse; PA = physical abuse; EA = emotional abuse; N = neglect; [1] sum of `ITEC present, file present` and `ITEC absent, file absent`; Se = sensitivity

Results of the logistic regression analyses indicated sexual abuse in the patient file was only predicted by the ITEC sexual abuse subscale, *Wald* (1) = 9.11, $p = .003$, *OR* = 4.88. Likewise, physical abuse in the patient file was only predicted by the ITEC physical abuse subscale, *Wald* (1) = 5.59, $p = .02$, *OR* = 4.55, and neglect in the patient file was only predicted by the ITEC neglect subscale, *Wald* (1) =6.75, $p = .009$, *OR* >10. In contrast, emotional abuse in the patient file was not predicted by the emotional abuse scale of the ITEC, *Wald* (1) = .39, $p = .53$, *OR* = .72, nor by any of the other ITEC subscales.

Convergent and discriminant validity

Pearson correlation between the corresponding 5 factors of the ITEC and the CTQ are shown in table 8. CTQ data were available for 133 participants. Both correlations between parallel and non-parallel subscales are shown. Correlations between parallel subscales vary between .46 and .80 (mean r = .62). The highest correlation were obtained for the parallel sexual abuse scales, and the lowest for the physical neglect scales. All correlations between the parallel subscales were highly significant, revealing clear and strong associations between all parallel ITEC and CTQ subscales. Extra support for the discriminant validity of the ITEC sexual and physical abuse scales and the physical neglect subscale is obtained by the fact that despite the (mostly) significant correlations between non-parallel subscales (ranging between .22 and .59), correlations are always lower than the correlations between parallel subscales. Correlations between emotional abuse and physical neglect and non-corresponding scales, however, are not markedly lower than the correlations between their parallel subscales, yielding less support for the discriminant validity of the ITEC emotional abuse and physical neglect subscales.

Table 8: Pearson correlations between the ITEC and CTQ subscales (N = 133).

ITEC	CTQ				
subscales	SA	PA	EA	EN	PN
SA	**.80****	.26**	.30**	.29**	.29**
PA	.22*	**.67****	.44**	.39**	.50**
EA	.40**	.59**	**.54****	.50**	.53**
EN	.41**	.58**	.61**	**.67****	.72**
PN	.20*	.35**	.19*	.24**	**.46****

Note: SA = sexual abuse; PA = physical abuse; EA = emotional abuse; EN = emotional neglect; PN = physical neglect; bold figures indicate corresponding correlations between parallel subscales of ITEC and CTQ; *p<.05; **p<.001

GENERAL DISCUSSION

These findings provide initial support for the reliability and validity of the ITEC. A 5-factor model consisting of sexual, physical and emotional abuse, emotional and physical neglect underlay the trauma reports when only victimization items were included in study I. When several new items were added to the ITEC (study II), the best fit was again provided by a 5-factor model. Further factor analyses revealed that summing objective aspects of the abusive events (i.e. severity of the abusive event, closeness of the perpetrator, age of onset and duration) is the best way to express the severity of maltreatment. All 5 subscales of the ITEC demonstrated moderate to excellent internal consistency. Furthermore, high correlations with the corresponding subscales of CTQ (Bernstein, et al. 1997; Bernstein & Fink 1998; Bernstein, et al. 2003) were obtained, indicative of good convergent validity. Inter-correlations between the 5 ITEC subscales were moderate, which shows that although different types of abuse often co-occur, these scales do represent sufficiently distinct entities. Criterion validity was assessed by comparing the presence of maltreatment as mapped by the ITEC with patient file information. Data indicated that sexual and physical abuse and neglect were uniquely predicted by their scores on their parallel ITEC subscales. This was not the case for emotional abuse. Finally, the ITEC showed good to excellent inter-rater reliability of the different subscales.

Overall, the psychometric quality of the emotional abuse scale appeared markedly lower than that of the other subscales. This emerged in lower discriminant validity of this scale, visible in lower unique correlations with corresponding CTQ subscales, and the fact that emotional abuse as assessed with the ITEC did not uniquely predict the presence of emotional abuse in the patients` records. This may be attributable to the fact that emotional abuse has fewer visible markers than other forms of maltreatment (e.g.,, physical or sexual abuse, physical neglect), making it more difficult to assess them. Nevertheless, the emotional abuse scale of the ITEC needs further refinement.

Some of the current findings call for further clarification. First, the psychometric quality of the physical neglect scale was lower than that of the other subscales, due to low base rates of neglect in our sample and the fact that this scale consisted of only 2 items. Additionally, it could be speculated that physical neglect is less common in the Netherlands than in the USA, because relatively few people in the Netherlands live in extreme poverty. We intend to include more physical neglect items in future versions of the ITEC, such as denying someone medical care or lack of failure to support the family financially. Second, although the model fit of the subjective severity indices (past and present experienced impact of the trauma) demonstrated to be notably poorer than that of the objective indices, this does not diminish the value of these subjective indices for descriptive purposes. It can be informative to compare subjective with objective severity indices between pathological subgroups. For example, it could be possible that in patient groups high in denial (e.g., forensic patients) correspondence between objective and subjective severity parameters are low. Therefore, we suggest object severity scores should be interpreted separately from subjective scores, because summing objective and subjective severity indices increases the chance on tautological conclusions due to differences in appraisal between groups. Third, with respect to the criterion validity, the presence of maltreatment cases detected by the ITEC that went unreported in the patient files indicates that the ITEC is more sensitive in detecting abuse history than standard intake procedures. This supports the incremental value of the ITEC in clinical practice.

The current study has several limitations. Firstly, some of the abusive experiences measured by the ITEC were infrequently reported by the present sample, for example, having been cut with a knife or burned by someone, and the items for witnessing sexual abuse. On the other hand, these events may be more common in other populations, or may have important clinical correlates. We have decided to retain these items until we can determine their base rates in other samples, and investigate their clinical utility. Secondly, while there was high agreement among raters as to the severity of different types of abusive events, rating them according to severity is a matter of subjective judgment. For example, giving `hitting someone` a severity score that is twice as high as that of `throwing an object at someone` implies hitting someone is twice as severe. Clearly, this ratio is based on an assumption that cannot be tested objectively. Third, the reasonably high level of agreement between the ITEC and the CTQ can also be interpreted in favour of the use of questionnaires, since it suggests comparable results on childhood abuse history can be obtained with a questionnaire that is less time consuming to administer. On the other hand, interviews like the ITEC provide the opportunity to ask follow up questions and gather detailed information that is not possible with a questionnaire. Moreover, interviews can be scored using methods that are less dependent on the judgment of the interviewee himself, making them potentially less vulnerable to biases such as socially desirable responding. Finally, validating an instrument like the ITEC with patient records has inherent methodological problems. It has been repeatedly shown that patient records contain a high percentage of false negative trauma reports, leading to artificially low rates of specificity, when compared with trauma reports obtained by more systematic means, such as structured interviews. For this reason, we chose not to compute specificities for the ITEC in our study. Not surprisingly, the ITEC revealed several instances of maltreatment

that had been missed in the clinical record. On the other hand, there were a number of cases of abuse that had been reported in the clinical record that were missed by the ITEC. These may be real false negatives, or may instead result from inaccurate clinical judgments, i.e., clinicians who incorrectly determined that maltreatment was present. Thus, the sensitivities for the ITEC reported in this study, though very high, may still underestimate the actual sensitivity of the instrument for detecting maltreatment.

Further studies will be required to refine the ITEC scales that performed less well (e.g., emotional abuse and physical neglect), and to cross-validate the current findings in other clinical and non-clinical groups. Cross-cultural comparisons will also be necessary with other linguistic, national, and ethnic groups (e.g., native English speakers).

In conclusion, our findings support several aspects of the ITEC's reliability and validity, including its internal consistency reliability; factorial validity; convergent and discriminant validity with the CTQ; and criterion validity with therapists' trauma reports. Additionally, our findings provide empirical support for a scoring system that combines objective indicators of trauma severity. To our knowledge, the ITEC is the first childhood trauma instrument to have been validated in such a comprehensive manner. The ITEC provides broad assessment of maltreatment experiences, including both victimization (i.e., child abuse and neglect) and witnessing of emotional and physical abuse. Taken together, these findings suggest that the ITEC is a promising new instrument for brief yet comprehensive assessment of childhood trauma.

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Chapter 8

Disentangling the relationship between different types of childhood trauma and personality disorders.

Lobbestael, J., Arntz, A. & Bernstein, D. Disentangling the relationship between different types of childhood trauma and personality disorders. *Submitted for publication.*

ABSTRACT

This study investigated the relationship between five forms of childhood trauma (sexual, physical and emotional abuse, emotional and physical neglect) and 10 personality disorders (PDs). PDs were assessed by means of SCID II, and childhood trauma was retrospectively measured by means of the Interview for Traumatic Events. Both PDs and childhood trauma were expressed continuously, and relations were assessed by means of structural equation modelling in a sample of 409 participants. Results indicated that sexual abuse was highly associated with symptoms of paranoid, schizoid, borderline and avoidant PD; physical abuse with antisocial PD; emotional abuse with paranoid, schizotypical, borderline and cluster C PD; and emotional neglect with histrionic and borderline PD. No independent relationships between physical neglect and PDs were found. The findings provide strong, albeit retrospective, evidence that different forms of childhood abuse have differential effects on PD pathology.

INTRODUCTION

There is growing empirical support for the notion that childhood trauma plays a formative role in the development of personality disorders (PDs). Prospective studies of general population samples (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Johnson, Cohen, Chen, Kasen, & Brook, 2006; Johnson, Smailes, Phil, Cohen, Brown et al., 2000) and high-risk samples (Horwitz, Widom, McLaughlin, & White, 2001) have shown that children who were abused or neglected are at increased risk for the development of PDs. Despite these recent findings, many questions remain about the nature of the relationship between childhood trauma and PDs. First, the above-mentioned studies assessed environmental risk, but did not assess genetic risk for PDs in the same participants. Because of gene-environment correlations (Rutter & Silberg, 2002), the effect sizes for childhood trauma in these studies might be over-estimated. In fact, despite the widely held belief that sexual abuse is a major risk factor for borderline PD, a meta-analysis found that the average effect size in studies of the relationship between sexual abuse and borderline PD was only .30: a moderate correlation (Fossati, Madeddu, & Maffei, 1999). Recent evidence suggests that childhood abuse may have its strongest effects in genetically predisposed individuals. In a frequently cited prospective study (Caspi, McClay, Moffitt, Mill, Martin et al., 2002) the effect of childhood abuse on later antisocial behavior was strong in individuals with one variant of a serotonergic gene, but weak in individuals without this variant. This suggests that gene-environment interactions are likely to be of critical importance for the effect of childhood trauma on PDs, consistent with a diathesis-stress model of illness (Zubin & Spring, 1977).

In addition to questions about the causal role of childhood trauma on PDs, questions remain about the specificity of traumatic effects. Childhood trauma may act as a generalized stressor that increases the likelihood of the development of PD symptoms in genetically predisposed individuals. In this model, the expression of PD symptoms may be more a function of the genetic diathesis than the specific nature of the trauma itself (e.g., whether children were sexually versus physically abused). On the other hand, different

forms of trauma may have specific relationships with PD symptoms. For example, there is a large body of evidence suggesting that childhood physical abuse is related to later violence and aggression (Kaplan, Pelcovitz, & Labruna, 1999), supporting the notion that physical abuse may play a unique role in the development of antisocial PD. Similarly, although many forms of childhood trauma have been implicated in the development of borderline PD, most studies have found that childhood sexual abuse has the strongest relationship with borderline PD pathology (Paris, Zweig-Frank, & Guzder, 1994a, 1994b).

The attempt to disentangle the unique contributions of different forms of childhood trauma to PDs is a complicated one. Different forms of childhood trauma tend to co-occur in the same individuals, and rates of comorbidity among PDs are high. As a result, multivariate models are needed that simultaneously examen the effects of the full range of childhood trauma on the entire spectrum of DSM-IV PDs. To our knowledge, only two previous studies (Bernstein, Stein, & Handelsman, 1998; Bierer, Yehuda, Schmeidler, Mitropoulou, New et al., 2003) have met this requirement. Both of these studies measured childhood trauma retrospectively. In a sample of mostly male substance dependent adults, Bernstein and colleagues (1998) found that childhood physical abuse and physical neglect were associated with antisocial PD; emotional neglect with schizoid PD; and emotional abuse with PDs in all 3 DSM-III-R PD clusters. In a general psychiatric sample from which substance dependent patients were excluded, Bierer and colleagues (2003) found that paranoid PD was predicted by sexual, physical, and emotional abuse, while antisocial PD was predicted by sexual and physical abuse. Borderline PD was predicted only by emotional abuse.

One very striking finding in both of these studies was the absence of *unique* or *independent* effects of child sexual abuse on borderline PD pathology. Thus, although both studies found significant zero-order correlations between childhood sexual abuse and borderline PD, these effects "disappeared" after the effects of other, co-occurring forms of childhood trauma were controlled for. This raises the question of whether some of the putative effects of childhood sexual abuse found in previous studies (Paris et al., 1994a, 1994b) might actually be attributable to other co-occurring forms of trauma (e.g., emotional abuse), which were not measured or adequately controlled for. Only multivariate studies, simultaneously examining the relationships among multiple forms of trauma and multiple PDs, can clarify this issue.

In the present study, we used a multivariate approach to disentangle the unique effects of different forms of childhood trauma on the full range of DSM-IV PD pathology in a large (N=409) heterogeneous sample including both patients and non-patients. Thus, our study is one of the few extant attempts to investigate this issue using a methodologically adequate approach.

METHOD

Participants

Data were collected as part of several research projects at Maastricht University, The Netherlands. The 409 participants included patients from several outpatient, inpatient, and forensic mental health care institutes in the Netherlands and Belgium (n=250), and non-patient controls (n=159). The non-patients were recruited through advertisement in local newspapers. Of the sample, 64.1% was female and 27.6%

male with a mean age of 33.54 (SD = 10.65, range = 18 – 61). With respect to educational level, 0.5% received no education, 9.3% attended primary school and 35.7% high school or low-level vocational studies, while 26.4% completed a secondary education and 22.5% a higher education. To be included, subjects had to be between 18 and 65 years of age, and of normal intelligence (IQ>80). Exclusion from the study occurred if patients met the criteria of a psychotic or bipolar disorder because of the possibility of these disorders overshadowing the PD phenomena due to their high severity. Exclusion criteria for non-patient controls were the presence of axis I or axis II disorders.

Of all 409 participants, 250 received one or more diagnoses on axis II. Thirty-three percent suffered from a borderline PD, 19.8 % from an avoidant PD, 14.7% from a depressive PD, 14.4% from an obsessive-compulsive PD, 7.8% from an antisocial PD, and 5.4% from a dependent or a paranoid PD. Other PDs occurred in 5% or less of the cases. Data on axis I diagnoses were available for 385 participants. Of this group, 41.8% had an anxiety disorder, 35.7% a mood disorder, 14.4% substance abuse, 8.1% an eating disorder, and 5.1% a somatoform disorder. One hundred eighty-nine participants out of these 385 received no diagnoses on axis I. The study obtained institutional ethical approval.

Materials

Diagnostic Interviews

The Structured Clinical Interview for DSM-IV axis I and axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon, & Williams, 1997; First, Spitzer, Gibbon, Williams, & Benjamin, 1994) were used to assess DSM-IV axis I diagnoses and personality pathology. Interviewers were extensively trained and supervised by the first or second author. Previous studies have supported the reliability and validity of the SCID I and SCID II (Maffei, Fossati, Agostoni, Barraco, Bagnato et al., 1997; Martin, Pollock, Bukstein, & Lynch, 2000; Weertman, Arntz, Dreessen, van Velzen, & Vertommen, 2003; Zanarini, 2000; Zanarini & Frankenburg, 2001). For the current study, 97 SCID interviews were rated twice from audio tapes of the original interviews. Inter-rater reliabilities were excellent for both axis I disorders (kappas ranged between .98 and 1.00) and axis II disorders (Intraclass correlations for trait scores between .88 and .99, with a mean of .94; avoidant PD =.99; dependent PD= .98; obsessive-compulsive PD= .94; passive-aggressive PD=.94; depressive PD=.99; paranoid PD=.99; schizotypical PD=.88; schizoid PD=.90; histrionic PD=.84; narcissistic PD=.92; borderline PD=.99; antisocial PD=.88).

Interview for Traumatic Events in Childhood (ITEC)

The Interview for Traumatic Events in Childhood (ITEC, Lobbestael, Arntz, Kremers, & Sieswerda, 2006) was used to assess five forms of childhood maltreatment prior to the age of 18: sexual abuse, physical abuse, emotional abuse, emotional neglect and physical neglect. The ITEC asks about factual events such as `were you ever hit?`, minimizing the risk of biased interpretation of the questions. This interview specifies the actions, age of onset, perpetrator(s), frequency and duration of childhood trauma. The interview has predetermined answer categories and results in composite scores for each of the abuse and neglect scales separately. The higher the composite score, the higher the severity of trauma. These

composite scores were constructed out of the severity of the experienced trauma, the closeness/proximity of the perpetrator (the closer the perpetrator the higher the score), age at time of trauma (the younger the subject the higher the score) and duration (the longer the duration the higher the score). Confirmatory factor analyses confirmed the five-factor structure of the ITEC and revealed good internal reliability of the subscales (mean α= .81) and moderate inter-correlations between the subscales, next to excellent inter-rater reliability (mean ICC = .91). Correlations with the corresponding subscales of the Childhood Trauma Questionnaire were moderate to high, indicative of acceptable convergent validity. Criterion related validity (i.e. correlation with patient file information) was good for all the subscales except for emotional abuse. However, since the physical neglect scale only consisted out of two items causing an inadequate internal reliability (Cronbach`s α =.58), more physical neglect items should be included in further ITEC versions (Lobbestael, Arntz, Harkema-Schouten, & Bernstein, submitted for publication).

Procedure

After complete description of the study to the subjects, written informed consent was obtained. Next, the SCID I and SCID II were administered, followed by the ITEC.

Statistical analyses

The PDs were expressed continuously, calculated by adding the scores (range 1 to 3) of each SCID II criteria per PD. This method has the advantage that the severity of PDs can be taken into account, and comorbid traits of other PDs can be accounted for statistically, possibly providing more power to the findings. To evaluate the relationship between the 10 PDs and childhood abuse and neglect, first, Pearson correlations were calculated between these variables. Next, in order to test the unique effect of each type of trauma on each PD, path analyses were conducted using Amos 5.0 (Arbuckle, 2005). In this path model, PDs were defined as the dependent, endogenous variables, and childhood trauma as the independent, exogenous variables. Since comorbidity between PDs is inherent to the PD construct, covariance between PDs was allowed and error variance of the PDs was let free. All path coefficients represented the influence of the specific form of trauma on the specific PD corrected for the other kinds of trauma. The correlations between the PDs and trauma were determined stepwise in four phases in order to come to a more fine-grained model and to exclude the influence of the non-significant correlations. First, simple Pearson correlations were calculated between all PDs and all forms of trauma. Second, all direct cross-paths between the PDs and the five forms of trauma were tested, resulting in a saturated model. This way, each type of trauma is controlled for the presence of the other types of trauma. Third, non-significant relations at the $p>.10$ level were removed from the model. Fourth, non-significant relations at the $p>.05$ level were removed from the model. In order to test the one-sided hypothesis of positive relationships between PDs and trauma for each group, correlations of the final model were interpretated at the Bonferonni-corrected significance level of $p<=.01$, controlling significance levels per PD (.05/5, 5 trauma types).

Inspection of the data showed non-normal distributions of both level of PDs and childhood trauma. Since violation of the normality assumption has been shown to lead to underestimated standard errors (Tomarken & Waller, 2005), a bootstrap method is advisable because test statistics from this method are based on an empirical distribution obtained from the original sample data rather than relying on an a priori normal distribution. In the current study, the Monte Carlo bootstrap procedure was used utilizing 10000 samples.

To determine the influence of gender on the relationship between PD and childhood trauma, Amos path analyses were conducted in both male and female samples separately. It was tested whether regression coefficients differed significantly between these two samples by calculating the z-scores (formula: $z = (\beta_{male} - \beta_{female}) / (\sqrt{SE_{male}^2 + SE_{female}^2})$. Because of the high number of tests that were performed in this respect (50), results were interpreted at the more stringent Bonferroni-corrected significance level of $p<.001$ (.05 / 50).

RESULTS

Descriptives

Mean severity scores of the abusive characteristics per type of abuse are presented in table 1. Eighty-seven percent of the sample had a history of any type of abuse or neglect. Thirty-eight percent of the participants experienced at least one sexual abusive event, 65.3% at least one physical abusive event, 71.6% at least one abusive emotional event, 58.2% at least one emotional neglect event, and 7.1% at least one physical neglect event.

Table 1: Mean severity scores and standard deviations of the abusive characteristics per type of abuse.

Abuse characteristics	Sexual abuse	Physical abuse	Emotional abuse	Emotional neglect	Physical neglect
Actions[1]	4.75 (9.26)	9.17 (11.47)	18.47 (15.57)	13.86 (16.30)	1.30 (6.15)
Age of onset[2]	6.22 (12.52)	12.06 (14.92)	22.21 (20.38)	15.65 (9.43)	2.63 (12.70)
Perpetrator[3]	1.91 (10.77)	13.49 (17.29)	26.15 (23.64)	20.48 (24.71)	2.87 (13.23)
Duration[2]	4.01 (10.67)	10.02 (21.71)	22.65 (21.71)	17.37 (22.02)	2.28 (10.96)
Overall severity					
Low	87.4%	70.4%	63.8%	74.6%	95.1%
Medium	11.3%	27.1%	28.1%	23.9%	3.4%
High	1.2%	2.5%	8.1%	1.5%	1.5%

Note: [1]the severity of the actions; [2]expressed in years; [3]the closeness of the perpetrator; for means of feasibility, all means and standard deviations are multiplied by 100.

Pearson correlations

Pearson correlations between the 5 types of trauma and the various PDs are presented in table 2. These data reveal many significant correlations between specific trauma types and PDs when not corrected for the presence of other traumas and PDs. More specifically, emotional and physical abuse and emotional neglect correlate significantly with all PDs; sexual abuse and physical neglect with 7 out of 10 PDs.

Table 2: Pearson correlations between personality disorders and childhood abuse and neglect.

Personality disorders	Sexual abuse	Physical abuse	Emotional abuse	Emotional neglect	Physical neglect
Cluster A					
Paranoid	.27**	.24**	.29**	.26**	.12*
Schizotypal	.19**	.25**	.29**	.21**	.11*
Schizoid	.21**	.22**	.24**	.23**	.12*
Cluster B					
Histrionic	.08	.19**	.18**	.20**	.12*
Narcissistic	.08	.18**	.15*	.14*	.07
Borderline	.40**	.33**	.42**	.39**	.16*
Antisocial	.14*	.28**	.15*	.18**	.10*
Cluster C					
Avoidant	.20**	.15*	.28**	.20**	.09*
Dependent	.13*	.15*	.32**	.28**	.08
Obsessive-comp	.07	.09*	.21**	.14*	.06

Note: * significant at p<.05; ** significant at p<.001

Path analyses

When looking at the unique effects of each type of trauma on each PD by means of Structural Equation Modelling, a different pattern emerges. Standardized path coefficients and significance values for the relationships between PDs and childhood abuse and neglect of the saturated model are shown in table 3. In this saturated model, 9 correlations were significant, 5 at the p<.01 level and 4 at the p<.001 level.

Table 3: Path coefficients for the relationship between personality disorders and childhood abuse and neglect.

Personality disorders	Sexual abuse	Physical abuse	Emotional abuse	Emotional neglect	Physical neglect
Cluster A					
Paranoid	.17*	.05	.15	.08	-.02
Schizotypal	.07	.10	.19*	.01	-.008
Schizoid	.11	.08	.09	.10	-.006
Cluster B					
Histrionic	-.04	.12	.02	.14	.03
Narcissistic	-.008	.14	.03	.07	-.02
Borderline	.26**	.07	.19*	.17*	-.07
Antisocial	.04	.29**	-.12	.12	-.01
Cluster C					
Avoidant	.11	-.06	.28**	.01	-.01
Dependent	-.001	-.09	.30**	.14	-.05
Obsessive-comp	-.006	-.07	.25*	.02	-.004

Note: * significant at p<.01; ** significant at p<.001

In the next step, 33 obviously non-significant paths at p>.10 were removed from the model. Finally, another 4 non-significant paths at p>.05 were removed. This stepwise approach yielded a final model in which 13 relationships between PDs and traumas were significant, 2 at the p<.01 level and 11 at the p<.001 level (see figure 1). All significant regression coefficients were positive, supporting the hypothesis that childhood trauma has a positive correlation with PDs. The relationship between narcissistic PD and physical abuse and between dependent PD and emotional neglect were not included in the model, since it was not significant at the p<.01 level, p=.04 and p=.03, *respectively.* Regarding cluster A PDs, a significant association was found between paranoid PD and sexual and emotional abuse, between schizotypical and emotional abuse and between schizoid and sexual abuse. With respect to cluster B PDs, histrionic PD was associated with emotional neglect, borderline PD with sexual abuse and emotional abuse and neglect, and antisocial PD with physical abuse. All cluster C personality disorders correlated highly significantly with emotional abuse, and avoidant PD was associated with sexual abuse.

Gender

With respect to gender, none of the differences in regression coefficients between men and women were significant at the p<.001 level. Therefore, it is unlikely that men and women differ with respect to the association between PDs and childhood trauma.

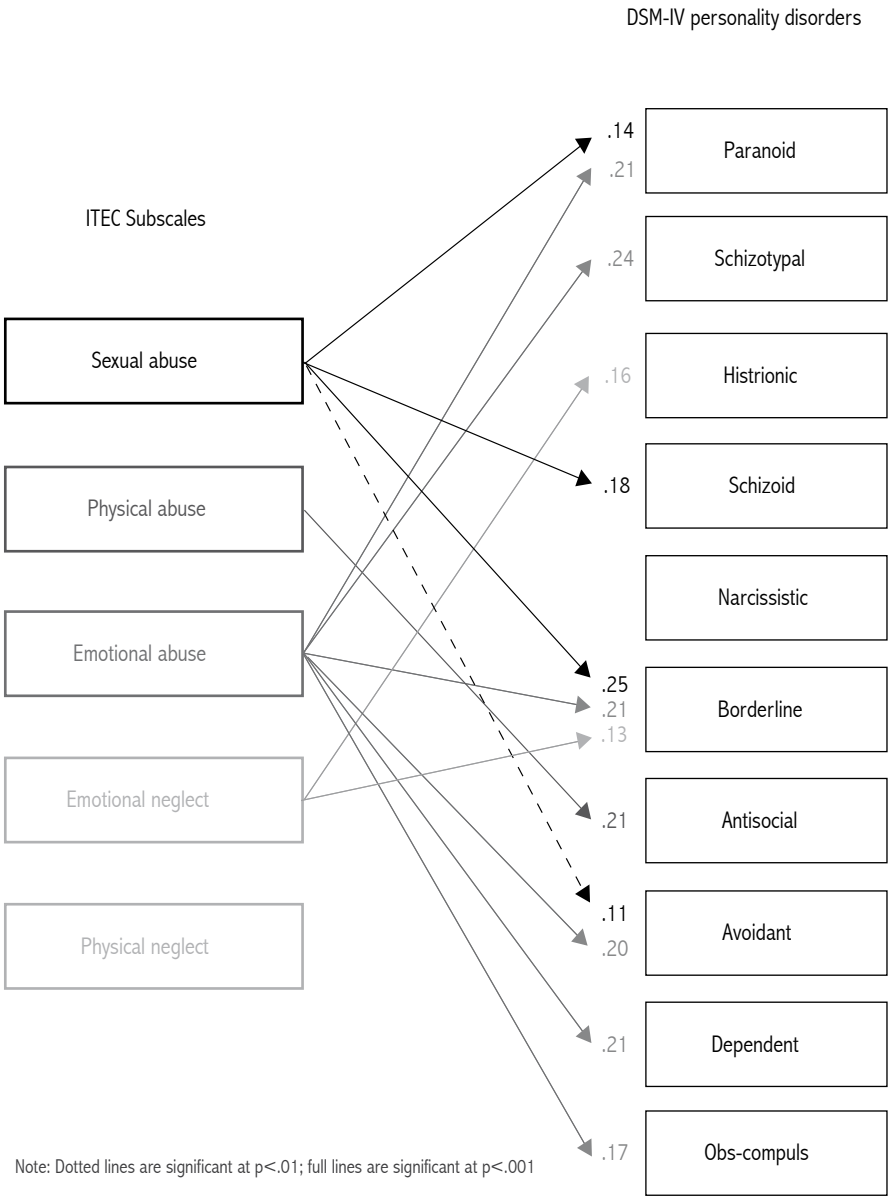

Fig. 1. Significant path coefficients of the relationships between personality disorders and childhood abuse/neglect

DISCUSSION

Our findings show clear evidence of differential relationships between types of childhood trauma and different PDs. Structural equation modelling analyses indicated that sexual abuse was associated with paranoid, schizoid, borderline and avoidant PD; physical abuse with antisocial PD; emotional abuse with paranoid, schizotypal, borderline and cluster C PD; and emotional neglect with histrionic and borderline PD. The moderate strengths of the relationships we found can be explained by the use of a multivariate model in which the effects of different forms about trauma were partialled out from each other. Thus, the ß-weights represent the *unique* or *independent* effects of each form of trauma, not the effects that are shared in common. Other factors limiting the ß-weights include measurement error and other etiological factors that were not measured in this study.

Within a diathesis-stressor model, the effects of different types of trauma might be explained both by the nature of the underlying diathesis (e.g., biological-psychological vulnerability) and by the nature of the trauma that occurred. There may also be general effects of trauma that simply increase the likelihood that some kind of pathology will be expressed. This hypothesis would need to be confirmed by longitudinal studies of PDs that measure both different types of trauma and biological diathesis. A multifactorial model of the etiology of PDs is likely to best capture the complexity of these disorders.

Our findings are consistent with previous studies of the effects of childhood trauma, and also make theoretical sense. The finding that emotional abuse was correlated with paranoid, schizotypical and borderline PD symptoms, as well as with the Cluster C PDs, is consistent with a previous study (Bernstein et al., 1998) showing that emotional abuse was a broad risk factor for PDs in all of the DSM's axis II clusters. Emotional abuse has been hypothesized to cause low self-esteem (Battle, Shea, Johnson, Yen, Zlotnick et al., 2004; Kaplan et al., 1999), which is a core feature of many of the cluster C PDs. For example, patients with avoidant PD are highly rejection sensitive, while those with dependent PD doubt their ability to function independently. Thus, emotional abuse may play an important role in the genesis of Cluster C personality disorders.

Numerous studies have found that childhood sexual abuse is associated with borderline PD (Battle et al., 2004; Johnson et al., 1999). Moreover, many sequelae of sexual abuse – such as depression, self-destructive behaviour, anxiety, feelings of isolation and stigma, poor self-esteem, difficulty in trusting others, a tendency towards revictimization, substance abuse and sexual maladjustment (Browne & Finkelhor, 1987; Kendall-Tackett, Williams, & Finkelhor, 2001)– are either symptoms or sequelae of borderline PD. The finding that emotional abuse and emotional neglect were also associated with borderline PD suggests the importance of emotional trauma in these patients, consistent with many earlier studies (Battle et al., 2004; Bernstein et al., 1998; Bierer et al., 2003; Johnson et al., 1999; Johnson et al., 2006). Thus, sexual abuse appears not be the only pathogenic form of trauma in borderline PD.

The fact that sexual abuse often causes feelings of shame, stigmatization, and mistrust (Bierer et al., 2003; Browne & Finkelhor, 1987; Raczek, 1992; Sebold, 1987) may explain our finding that sexual abuse was related to paranoid PD, a disorder for which mistrust of others is the central defining feature. The link

between sexual abuse and schizoid PD replicates previous findings (Moreno, Selby, & Neal, 1998; Swett & Halpert, 1993), and might be explained by the notion that some victims cope with sexual abuse through the pervasive use of avoidance and dissociation (Brewin, 2000; Terr, 1994). The relationship between avoidant PD and sexual abuse can be explained by the finding that survivors of sexual abuse often use disengaged or avoidant coping strategies (Griffing, Lewis, Chu, Sage, Jospitre et al., 2006).

Many studies have shown that childhood physical abuse is related to aggression and antisocial behaviour (Bierer et al., 2003; Johnson et al., 1999) consistent with theories about the inter-generational transmission of violence and criminality (Egeland, Jacobvitz, & Sroufe, 1988) and paralleling our own finding that physical abuse was related to antisocial PD.

The finding that emotional neglect in childhood was related to histrionic PD is consistent with the idea that attention seeking is a central dynamic in the genesis of histrionic behaviour (Bornstein, 1999). Surprisingly, however, we found no independent effects of physical neglect. Studies have shown that physical neglect is associated with juvenile delinquency, and thus might be a risk factor for later criminality (Loerber & Dishion, 1983). In fact, previous longitudinal studies have found that physical neglect in childhood predicts the development of a broad range of DSM PDs. One possible explanation for the discrepancy with our findings is that previous studies have usually not examined the effects of neglect in the context of other, co-occurring forms of maltreatment. This hypothesis is supported by our finding that the zero-correlations between physical neglect and most cluster A and B PDs were significant. Thus, physical neglect may have broad, rather than specific effect on PD pathology. On the other hand, our lack of findings for physical neglect may reflect deficiencies in our measuring instrument for childhood trauma, the ITEC. In our validation of the ITEC (Lobbestael, Arntz, Harkema-Schouten, & Bernstein, submitted for publication) we noted poor reliability for the physical neglect scale. Thus, the unexpected lack of findings for physical neglect might reflect the problematic nature of this scale, which is currently undergoing revision. Finally, one additional possibility is that the prevalence of physical neglect in The Netherlands may be lower than in other countries (e.g., the United States), because the social welfare system mitigates the likelihood of extreme poverty. Thus, the lack of unique effects of physical neglect may reflect the relative absence of the phenomenon itself.

Our study had several methodological strengths, including its large, heterogeneous sample, including outpatient, inpatient, and forensic groups, as well as a large non-patient group; its inclusion of individuals with a broad range of childhood trauma experiences, and a broad spectrum of PDs; and the use of instruments that enabled a multivariate approach to disentangle the relationships between childhood trauma and PDs. The major limitation of the study is that all of the trauma information was obtained through retrospective self-report. While this method is often described as unreliable and prone to memory distortion, it was recently shown that self-reports of childhood trauma obtained with the ITEC are usually substantiated when corroborative information is available (Lobbestael et al., submitted for publication). Additionally, test-retest correlations of the number of traumatic events in borderline patients as assessed with an earlier version of the ITEC indicated high stability following a 27-months treatment (Kremers, Van

Giezen, Van der Does, van Dyck, & Spinhoven, 2007). Furthermore, this interview asks for very specific abusive acts, leaving less room for biased reports. Nonetheless, we cannot draw definite conclusions about causality based on these retrospective data.

Despite these considerations, our study represents one of the few extant attempts to disentangle the effects of different forms of childhood trauma on a broad range of PD pathology, using a multivariate statistical approach. Our findings offer support for the idea that different forms of trauma have differential effects on PD pathology. These findings may help to better understand the core pathology of different PDs and help to decide what treatment should focus upon.

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Chapter 9

Emotional, cognitive and physiological correlates of abuse-related stress in borderline and antisocial personality disorder.

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ABSTRACT

Childhood abuse is an important precursor of borderline personality disorder (BPD) and antisocial personality disorder (ASPD). The current study compared the emotional reactivity to abuse-related stress of these patients on a direct and an indirect level. Changes in self-reported affect and schema modes, psychophysiology and reaction-time based cognitive associations were assessed following confrontation with an abuse-related film fragment in patients with BPD (n=45), ASPD (n=21), Cluster C personality disorder (n=46) and non-patient controls (n=36). Results indicated a hyperresponsivity of BPD-patients on self-reported negative affect and schema modes, psychophysiology (with the exception of frowning activity) and implicit cognitive associations. The ASPD group was comparable to the BPD group on self-report indices and implicit cognitions but did not show physiological hyper-reactivity. These findings suggest that BPD and ASPD-patients are alike in some abuse-related response patterns, but can be differentiated in their physiological reactivity.

INTRODUCTION

One of the main common etiological precursors of borderline personality disorder (BPD) and antisocial personality disorder (ASPD) is childhood trauma. Both BPD and ASPD have been linked to a broad range of abusive events but sexual and emotional abuse seem to stand out in BPD-patient's history (Battle, Shea, Johnson, Yen, Zlotnick et al., 2004; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Lobbestael, Arntz & Bernstein, submitted for publication) and physical abuse in ASPD-patients (Bernstein, Stein, & Handelsman, 1998; Bierer, Yehuda, Schmeidler, Mitropoulou, New et al., 2003; Lobbestael et al., submitted for publication). Although quite a lot is known about maltreatment precursors of BPD and ASPD, the influence of abuse-related stressful reminders on these patients has hardly been studied. Schmahl, Elzinga, Ebner, Simms, Sanislow et al. (2004) compared the physiological reactivity to abandonment and abuse-related scripts of BPD-patients with post-traumatic stress disorder patients but did not found any difference between these groups. Brain imaging studies indicated that over- versus under-reactivity in different areas of dorsolateral and medial prefrontal cortex correlated to traumatic memory in BPD-patients (Schmahl, Vermetten, Elzinga, & Bremner, 2004), while abandonment memories caused a greater increase in bilateral dorsolateral prefrontal cortex activity in women with BPD compared to women without BPD (Schmahl, Elzinga, Vermetten, Sanislow, McGlashan et al., 2003). To our best knowledge, the impact of abuse-related stress on ASPD-patients has not been studied yet.

The current study investigated the effects of abuse-related stimuli in BPD and ASPD-patients, both at a direct and an indirect level. On a direct level, the effect of abuse-related stress was evaluated by means of self-reported emotions and schema modes. Schema modes originate from Schema-Focused Therapy (Young, Klosko, & Weishaar, 2003) and represent the emotional and cognitive states and coping responses that are active at a given point in time. Modes can be maladaptive or adaptive. The maladaptive modes are divided into four categories; child modes that result out of unmet core childhood needs; dysfunctional

coping modes that correspondent to an overuse of the fight, flight or freeze coping styles and dysfunctional parent modes that reflect behaviour of the patient's parent(s) towards the patient as a child that the patient has internalized. The adaptive modes reflect healthy thoughts, feelings and behaviours.

Since assessment of emotions by means of self-report is vulnerable to bias due to lack of self-knowledge or avoidance of negative thoughts and feelings (Wilson & Dunn, 2004), and lying and conning are central diagnostic features of ASPD (APA, 2005), the use of indirect measures is advisable. Therefore, the current study incorporated two indirect measures to assess the impact of abuse-related stimuli; psychophysiological indices and a reaction time based paradigm to measure the implicit association between the self and abuse. The latter paradigm was operationalized with the Single Category Implicit Association Test (SC-IAT, Karpinski & Steinman, 2006), a variant of the classical Implicit Association Task (IAT, Greenwald, McGhee, & Schwartz, 1998) in which associations with single targets like the self-concept can be measured without the need of an opposite category.

In sum, the central question of this study was: Do BPD and ASPD-patients differ in their reaction to abuse-related stimuli on self-reported emotions, self-reported schema modes, psychophysiological reactivity, and on implicit abuse-related self-image? We expected BPD-patients to display a stronger intensity of affective experiences in reaction to the abuse-related stimuli relative to control patients and non-patients. Due to similarities between BPD and ASPD (APA, 2005; Paris, 1997) and the common etiological influence of abuse, it was hypothesized that BPD and ASPD-patients would show a similar response pattern to abuse-related stimuli on levels the person cannot easily control. Since antisocials tend to underreport the impact of negative events, it was expected that the ASPD-group would indicate a lower increase in self-reported indices of negative affect and schema modes than the BPD-group. In contrast, we expected a similar abuse-related reactivity in BPD and ASPD-patients at an indirect level (i.e. the physiological indices and the implicit association task). Additionally, this study assessed the severity of childhood trauma in BPD and ASPD-patients and tested the effect of trauma severity on the changes in the direct or indirect abuse-related reactivity. Finally, the level of psychopathy was assessed in the ASPD-group and the predictive value of psychopathy on abuse-related stress was tested.

METHOD

Participants

Data were analyzed from N=147 participants, divided into four groups: patients with BPD (n = 45), patients with ASPD (n = 21), patients with cluster C personality disorder (CIC-PD, n = 46) and non-patients controls without psychopathology (NpC: n = 35). Patients were recruited from clinical, ambulant and forensic institutes of mental health care within the Netherlands and Belgium. The patients of the clinics and prisons were contacted to participate in this study by their therapists who were informed about the in- and exclusion criteria of the patients targeted for this study. The therapists provided general verbal

information and an information letter of this study to these patients and if the patients indicated that they were willing to participate, they were contacted by the experimenter. NpCs were recruited by means of advertisement in local papers.

General exclusion criteria were psychotic or bipolar disorder, age < 18 and > 60, intoxication by alcohol or drugs during testing, IQ below 80 and not being native speaker of Dutch. The non-BPD participants were not allowed to have more than two BPD criteria, and the non-ASPD participants were not allowed to have more than two ASPD criteria. The characteristics of the study groups are presented in table 1. Testing of between group differences revealed that the ASPD-group contained fewer women and the BPD-group fewer men than the other groups and that the ASPD-group was significantly lower educated than the other groups. Further analyses of this study were corrected for gender, but not for education since a lower education level is inherent to ASPD (Robins, Tipp, & Pzybeck, 1991). The ASPD-group had a significantly smaller number of axis I disorders compared to the BPD and CIC-PD groups, but the patient groups did not differ with respect to number of axis II disorders. The ethical committee of the Academic Hospital of Maastricht (the Netherlands) approved this study. Before starting the study, all participants gave written informed consent. The same study group was used for the study `Effects of induced anger in patients with antisocial personality disorder `(Lobbestael, Arntz, Cima & Chakhssi, submitted for publication). Data were described in two different manuscripts because of a different research question. Collection of the data for the two studies was performed in different sessions.

Table 1: Comparison between the groups on the demographic measures.

	BPD (n=45)	ASPD (n=21)	CIC-PD (n=46)	NpC (n=35)	Statistics	p value
Gender					$\chi^2 = 15.14$	.002
Men	12	16	17	16		
women	33	5	29	19		
Age	33.82	30.29	35.80	36.91	K-W[1]: $\chi^2 = 6.52$	.09
	(7.83)	(7.79)	(9.32)	(11.84)		
Education					K-W: $\chi^2 = 42.96$	<.001
No education	-	2	-	-		
Primary school	5	10	2	-		
High school	17	6	10	6		
Secondary education	19	3	21	16		
Higher education	4	-	13	13		
Number axis I disorders	3.18	1.67	3.09	-	K-W: $\chi^2 = 15.31$	<.001
	(1.44)	(1.59)	(1.74)			
Number axis II disorders	2.02	1.57	1.50	-	K-W: $\chi^2 = 4.99$	.09
	(1.12)	(.65)	(.59)			

Note: [1]Kruskall-Wallis

Materials

Screening

Axis I and II diagnoses were made using the DSM-IV criteria with the Dutch versions of the Structured Clinical Interview for DSM-IV Axis I disorders (SCID I, First, Spitzer, Gibbon, & Williams, 1997; van Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999) and the Structured Clinical Interview for DSM-IV Axis II disorders (SCID II, First, Spitzer, Gibbon, Williams, & Benjamin, 1994; Weertman, Arntz, & Kerkhofs, 2000). Diagnoses were made by the first author or graduate students who underwent an intensive training program. Of the current sample, 97 SCID interviews were rated twice, yielding high inter-rater reliability values for SCID I (Kappa values between .98 and 1.00) and SCID II (ICCs between .88 and .99). Psychopathy was assessed using the Psychopathy Chekclist-revised (PCL-r, Hare, 2003) supplemented by collateral data from the patient files. Ratings were made by the first author or staff of the forensic clinics. Previous studies revealed a two-factor, four-facet hierarchical model of the PCL-r (Bolt, Hare, Vitale, & Newman, 2004; Hare, 2003). The four facets are: interpersonal (facet 1), affective (facet 2), lifestyle (facet 3) and antisocial (facet 4). These four facets load onto two higher order factors: interpersonal (factor 1), and lifestyle/antisocial (factor 2). The total level of psychopathy, the PCL-r factors and facets were expressed continuously.

Traumatic events

The Interview for Traumatic Events in Childhood (ITEC, Lobbestael, Arntz, Kremers, & Sieswerda, 2006) was used to assess five forms of childhood maltreatment prior to the age of 18: sexual, physical and emotional abuse and emotional and physical neglect. This interview specifies the actions, age of onset, perpetrator(s), frequency and duration of childhood trauma. The interview has predetermined answer categories and results in composite scores for each of the abuse and neglect scales separately and a total abuse severity score. The higher the composite score, the higher the severity of trauma. Psychometric properties of the ITEC were adequate (Lobbestael, Arntz, Harkema, & Bernstein, Submitted for publication).

Abuse-related stress induction

Stress was induced by means of confrontation with an abuse scene of 20 minutes derived from the movie `No child of mine` by Hibbert and Kosminsky (1997). In this fragment, a 13-year old girl was physically, emotionally and sexually abused and neglected by her parents and other caretakers. Film fragments might be especially suitable as an abuse-related stress induction since media presentations were the most commonly reported trigger by abuse victims of the recall of trauma (Elliott, 1997).

Dependent variables

Direct assessment. Self-reported emotions were assessed by means of the Profile of Mood States (POMS), short version (McNair, Lorr, & Droppleman, 1992), with five subscales of tension, depression, anger, vigour, and fatigue. Schema modes were measured with an abbreviated version of the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael et al., 2007) consisting of 3 items for each of the 14

schema modes; Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, Undisciplined Child, Happy Child, Compliant Surrender, Detached Protector, Detached Self-Soother, Self-Aggrandizer, Bully and Attack, Punitive Parent, Demanding Parent and Healthy Adult modes. Each item had to be scored on a 100 mm VAS scale ranging from `not at all true` to `completely true`. An overall score was calculated from the scale sum score divided by three. A psychometric study of the complete version of the SMI (124 items) demonstrated good reliability and validity (Lobbestael, van Vreeswijk, Arntz, & Spinhoven, Submitted for publication). Internal reliability values of the abbreviated version of the SMI used in the current study varied between $\alpha = .54$ and $\alpha = .88$ with a mean of $\alpha = .72$. Because of the high number of schema modes assessed in this study, baseline and change scores of the schema modes were averaged for the adaptive (i.e. the Happy Child and the Healthy Adult) and the maladaptive modes (i.e. all other 12 modes besides the Happy Child and the Healthy Adult).

Indirect assessment. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured four times at each assessment using Omron M5-I via a standard cuff placed on the subjects` right arm above the elbow. To record heart rate, Blue sensor electrodes were attached over the lower rib on the left side of the trunk and to the subjects` chest to record a lead II electrocardiogram. Heart rate was expressed as the number of beats per minute. To monitor palm sweat gland activity, Ag/AgCl electrodes (8 mm diameter) filled with isotonic paste were attached to the volar surface of the medial segment of the middle and ring fingers of the non-dominant hand. A Galvanic Skin Response coupler supplied a constant 0.5 Voltage to assess skin conductance level (SCL) and response (SCR). SCR was defined as every response larger than .02 µS and smaller than 30 µS. The number of SCRs was counted during each assessment and divided by the duration of that assessment. Facial EMG was recorded bipolarly over the corrugator supercilli (frowning). The electrodes were placed on the left side of the face with 4-mm standard Ag/AgCl electrodes. Heart rate, SCL, SCR and EMG were recorded using the Vitaport III system, a portable continuously measuring physiological device, and analyzed off-line by means of a specially designed computer program. The SC-IAT measured the association between self and abuse. Participants were presented with words belonging to a target category or one of the two attribute categories, which they had to classify by pressing the left or right response key (Karpinski & Steinman, 2006). The target category of the SC-IAT consisted of individualized self-related items (first name, second name, date of birth, street[1], city[1], and school[1]), and two attribute categories of `abused` (maltreated, abandoned, powerless, helpless and lonely) and `loved` (loved, safe, wanted, hold, protected and secure). The time between the appearance of the word on the computer screen and the first key press was measured. The SC-IAT consisted of three practice blocks and two test blocks. In first test block, `self` and `abused` words had to be attributed to the same response button and `loved` to the other button. In the second test block `self` and `loved` were assigned to the same response button and 'abused' to the other button. Presentation order of the attribute category was randomized.

1 Since self-image related to abuse is associated with negative experiences during childhood, the individualized items of these words refers to the street, city and school the participant lived in or attended for the most part between the age of 5 and 12 years old. This way we attempted to make the self-category childhood related.

Participants were presented with identical SC-IATs before and after the stress induction. When compatible categories are assigned to the same response button, reaction times should be faster as compared to when both categories are incompatible. By comparing the average reaction time of the compatible block with that of the incompatible, the extent to which targets are associated with one versus the other attribute can be measured (Karpinski & Steinman, 2006).

Procedure

After signed consent was obtained, SCID-I, SCID-II and (for the ASPD-group) the PCL-r were administered. Next, electrodes and blood pressure cuff were attached. The experiment was divided into three different phases: (i) the neutral phase, in which participants had to watch a movie about monkeys (10 minutes, used as baseline, music by Oldfield, 2001), (ii) the stress induction phase (film fragment, 20 minutes), and (iii) the positive induction phase, in which participants were shown a fragment of a Mr. Bean movie (`It started with a sneeze`, 10 minutes). This last phase was included to minimize lasting impact of the stress induction on the participants. After each phase, participants filled in the POMS and the abbreviated SMI, while their blood pressure was recorded, and then completed the SC-IAT (except after the positive induction). Other physiological variables were measured continuously throughout the experiment. Finally, the experimenter removed the electrodes, and subjects were given a small financial compensation and were informed as to the nature of the study.

Statistical analyses

All dependent variables were transformed into change scores (post minus pre stress induction). The SC-IAT effect was defined as the difference in reaction time between self-words when associated with abused compared to loved. A positive SC-IAT score reflects a stronger self-abuse than self-loved association, a negative SC-IAT score reflects a stronger self-loved than self-abused association. The dependent variable of the SC-IAT analyses was the change score of SC-IAT effect from baseline to post-stress induction phase. A positive SC-IAT change score reflected an increase in self-abuse association from baseline to stress induction phase, and negative SC-IAT change scores reflected a decrease in self-abuse association.

The dependent self-reported emotions and physiological variables were subjected to a factor analyses to test whether composite variables could be constructed. A principal component method was used with direct oblimin rotation. A robust approach was chosen to analyze the changes in the dependent variables and the severity of childhood trauma since inspection of the data showed non-normal distributions of these variables. The influence of gender was tested by means of a 2 (gender) x 4 (group) robust ANOVA with Wilcox` Rallfun package version 6 written for R (R Development Team, 2007). Because some of the group x gender cells were too small, a full-factorial gender by group analyses could not be performed. Instead, only the main effect of gender was evaluated. When the gender effect was not significant, $p>.10$, it was left out of further analyses. Twenty percent trimmed group mean differences were tested using winsorized variance followed by multiple comparison with a family wise error rate procedure to control for the overall error rate (Wilcox, 2005). To test whether the dependent variables changed from baseline to abuse-related

stress phase, robust effect sizes were calculated with the following formula: $\delta_R = .642\ (\mu_{t2}-\mu_{t1} / \sigma_w)$, with μ_t = 20 % trimmed mean and σ_w = winsorized standard deviation (Algina, Keselman, & Penfield, 2005). An effect size of δ =.30 was interpreted as a small effect, an effect size of δ = .50 as a medium effect, and an effect size of δ =.80 as a large effect (Cohen, 1992).

The relationships between the severity of childhood trauma and the dependent variables were tested by means of Spearman's rho correlations. Finally, it was tested whether the ASPD-patients' level of psychopathy predicted the abuse-related responses by means of robust regression analyses executed with Theil-Sen procedure in Wilcox Rallfun package written for R (Wilcox, 2005).

RESULTS

Factor analyses of the dependent variables

Inspection of the scree test and eigenvalues indicated one factor for the POMS change scores, which accounted for 58.12% of the total variance. For the physiological changes, three factors occurred that accounted for 69.15% of the total variance: the blood pressure factor (SBP, DBP, HR less strongly), the skin conductance factor (SCL, SCR, HR less strongly), and frowning. Heart rate loaded almost equally high on the skin conductance and blood pressure factors. Skin conductance is regulated by the sympathetic system, and blood pressure by the β-adrenergic system, while heart rate is affected by both the parasympathetic and sympathetic system, and also is influenced by the α-adrenergic system. The three physiological factors were therefore labelled as the blood pressure factor (SBP, DBP and in part HR), the sympathetic response factor (SCL, SCR and in part HR) and frowning. Factor scores (regression method) were used for further analyses. Overall, the factor analyses diminished the number of dependent variables from 14 to 7; self-reported negative emotions (SRNE), maladaptive modes, adaptive modes, blood pressure (BP), the sympathetic response factor (SRF), frowning and the SC-IAT. All subsequent analyses are performed with these 7 dependent variables.

Self-reported negative emotions

At baseline, there was no main effect of gender on the SRNE, p=.66. The patient groups indicated a higher baseline level of negative emotions than the NpC group, the ClC-PD and BPD-groups higher than the ASPD-group and the ClC-PD group higher than the BPD group (table 2). Results on the change scores of the SRNE revealed no significant main effect of gender, p=.50. There was a significant effect for all groups of the change scores of the SRNE indicating that the negative emotions increased significantly after stress induction. The effect sizes were large for BPD and ClC-PD groups and medium for ASPD and NpC groups (table 3). Group difference analyses revealed that the BPD and the ClC-PD groups had a stronger increase in SRNE than the NpC group. Although BPD-patients reported stronger changes in SRNE than the ASPD-group, this difference just failed to reach significance (table 4).

Schema modes

At baseline, there was no main effect of gender on the level of the adaptive or maladaptive modes, p=.29. The patient groups indicated a higher baseline level of maladaptive modes than the NpC-group, and BPD and CIC-PD higher than the ASPD-group, while the opposite pattern of group contrasts were found for the adaptive modes (table 2). Results on the change scores of the maladaptive and adaptive modes revealed no significant main effect of gender, p`s>.11. There were small significant effect sizes for the modes in the BPD group, indicating that the maladaptive modes significantly increased and the adaptive modes significantly decreased after the stress induction in BPD-patients (table 3).

Table 2: Trimmed means (tM) and standard deviations (SDs) of all baseline scores, and group contrasts of the baseline levels of all dependent variables

Dependent variables	BPS tM[f] (SD_w)[g]	ASPD tM (SD_w)	CIC-PD tM (SD_w)	NpC tM (SD_w)	BPD vs ASPD	BPD vs CIC-PD	BPD vs NpC	ASPD vs CIC-PD	ASPD vs NpC	CIC-PD vs NpC
SRNE[a]	2.34 (3.26)	-.26 (1.43)	3.05 (4.19)	-1.64 (.80)	2.59**	-.71*	3.97**	-3.30**	1.38*	4.69**
Mal[b] modes	46.05 (10.35)	26.92 (12.13)	43.83 (12.77)	14.26 (8.60)	19.13**	2.22	31.80**	-16.91**	12.66**	29.57**
Adap[c] modes	51.37 (15.40)	66.23 (16.17)	47.76 (18.72)	83.80 (11.26)	-14.86*	3.61	-32.43**	18.47**	-17.57**	-36.04**
BP[d]	14.19 (3.78)	13.72 (1.54)	14.38 (1.69)	14.84 (2.64)	.47	-.19	-.66	-.66	-1.13	-.47
SRF[e]	1.77 (1.58)	2.67 (.79)	1.89 (1.13)	2.51 (1.08)	-.91*	-.12	-.75*	.79*	.16	-.63*
Frowning	16.38 (35.96)	125.24 (540.68)	38.59 (76.89)	40.49 (86.73)	-108.88	-22.23	-24.12	86.65	84.76	-1.89
SC-IAT	86.69 (140.23)	138.15 (180.34)	19.45 (80.04)	87.56 (104.74)	-51.45	67.24*	-.87	118.69*	50.59	-68.11*

Note: [a] self-reported negative emotions; [b] maladaptive schema modes, [c] adaptive schema modes, [d] blood pressure; [e] sympathetic response factor; [f] 20% trimmed mean; [g] winsorised standard deviation, ($\sqrt{var_w}$) / .642; * p<.05; ** p<.001.

Table 3: Trimmed means (tM) and standard deviations (SDs) of all change scores, and the effect sizes of the dependent variables for all groups

Dependent variables	BPD change score			ASPD change score (SD)			CIC-PD change score (SD)			NpC change score (SD)		
	tM[f]	SD[g]	ES[h]	tM	SD	ES	tM	SD	ES	tM	SD	ES
SRNE[a]	3.02	3.44	.88**	1.44	2.79	.51*	2.01	2.52	.80**	.99	1.47	.68**
Mal[b] modes	3.79	8.03	.47*	.003	7.92	.00	.34	3.70	.08	-.001	2.86	.00
Adap[c] modes	-4.35	12.61	-.34*	-3.26	16.14	-.20	-1.97	7.22	-.27	-1.53	7.68	-.20
BP[d]	.43	1.71	.25	-.55	1.67	-.33	.60	1.43	.42*	-.03	1.49	-.02
SRF[e]	.42	1.13	.38*	-.50	1.01	-.49†	.06	.81	.08	-.50	1.15	-.43*
Frowning	-12.62	32.39	-.39*	18.06	50.27	.36	-2.82	43.33	-.06	19.88	91.07	.22
SC-IAT	94.08	225.88	.42*	47.34	122.27	.39	-6.64	125.45	-.05	11.53	140.05	.08

Note: [a] self-reported negative emotions; [b] maladaptive schema modes, [c] adaptive schema modes, [d] blood pressure; [e] sympathetic response factor; [f] positive scores indicate increases in dependent variables, and negative scores indicate decreases in dependent variables, [g] robust standard deviation ($\sqrt{s_w^2}$) / .642 (;s_w^2 = winsorized variance) [h] robust effect size δ (equivalent to Cohen`s d), * p<.05; ** p<.001; † p<.10.

Table 4: Group contrasts on the change scores of all dependent variables

dependent variables	BPD vs ASPD		BPD vs CIC-PD		BPD vs NpC		ASPD vs CIC-PD		ASPD vs NpC		CIC-PD vs NpC	
		p	t	p	t	p	t	p	t	p	t	p
SRNE[a]	1.91†	.07	1.51	.14	3.43*	.001	-.76	.46	.64	.53	2.11*	.04
Mal[b] modes	1.73	.10	2.54*	.02	2.84*	.007	-.18	.86	.002	.99	.43	.66
Adap[c] modes	-.26	.80	-1.06	.30	-1.18	.24	-.33	.75	-.24	.67	-.44	.81
BP[d]	2.07*	.04	-.50	.62	1.18	.24	-2.60*	.02	-1.11	.28	1.80†	.08
SRF[e]	3.14*	.004	1.54	.13	3.21*	.003	-2.19*	.04	-.001	.99	2.26*	.03
Frowning	-2.51*	.02	-1.11	.27	-1.79†	.09	1.61	.12	-.09	.93	-1.21	.23
SC-IAT	1.02	.32	2.43*	.02	1.90†	.06	1.56	.13	.97	.34	-.58	.57

Note: [a] self-reported negative emotions; [b] maladaptive schema modes, [c] adaptive schema modes, [d] blood pressure; [e] sympathetic response factor; * $p<.05$; † $p<.10$.

Group differences showed that the BPD-group indicated a stronger increase in maladaptive modes than the ClC-PD and NpC-groups, but the difference with ASPD failed to reach significance. There were no group differences regarding the change in adaptive modes (table 4). Further analyses of the specific maladaptive and adaptive modes showed that the effect sizes were significant for the BPD group for the modes of the Vulnerable Child and the Furious Child (both large effects) and the Healthy Adult (small negative effect), for the ASPD group for none of the modes, for the ClC PD group for the Vulnerable Child and the Detached Protector (both medium effects) and the Happy Child (medium negative effect), and for the NpC group for the Vulnerable Child and Self-Aggrandizer (both large effects) and the Impulsive Child (medium negative effect).

Physiological measures

At baseline, there was a no main effect of gender on BP and SRF, *p*`s>.19. There was a main effect of gender on frowning, which was higher in men, $F(1, 140) = 6.09$, $p=.02$. There were no group differences in baseline BP and frowning levels. The BPD-group displayed a higher and the ClC-PD group a lower baseline level of SRF compared to the ASPD and NpC-groups (table 2). Results on the change scores of the physiological indices revealed no significant main effect of gender, *p*`s>.12. BP significantly increased in the ClC-PD group, while SRF significantly increased in the BPD-group and decreased in the NpC group and frowning significantly decreased in the BPD-group, all small effects (table 3). The ASPD-group displayed a smaller increase in blood pressure compared to the BPD and ClC-PD groups. Both BPD and ClC-PD patients showed a stronger increase in SRF than the ASPD and NpC-groups. The ASPD-group displayed an increase in frowning activity and the BPD-group a decrease, which significantly differed from each other (table 4).

SC-IAT

At baseline, there was a main effect of gender on the SC-IAT, $F(1, 141) = 7.55$, $p=.02$, indicating that men had a stronger SC-IAT effect (i.e. association between `self` and `abuse`) at baseline than women. BPD, ASPD and NpC groups had a higher baseline SC-IAT score than the ClC-PD group (table 2). The effect size indicated a significant change of the SC-IAT effect from the baseline to the stress induction phase in the BPD-group with a medium effect size (table 3). Results on the change scores of the SC-IAT revealed no significant main effect of gender, $p=.11$. The BPD-group displayed a stronger change towards a self-abuse association than the ClC-PD group and (almost significantly) than the NpC-group. The difference between BPD and ASPD failed to reach significance (table 4).

Childhood trauma

There was a main effect of gender on the severity of abuse, $F(1,136) = 6.56$, $p= .01$, indicating that women had experienced a higher level of abuse than men. The patient groups had higher childhood abusive scores than the NpC-group (see table 5).

Table 5: Mean, standard deviations and contrasts between the groups of childhood trauma

	Total trauma
Mean BPD (sd)	46.30 (30.49)
Mean ASP (sd)	30.70 (33.19)
Mean CIC-PD (sd)	30.60 (26.43)
Mean NpC (sd)	6.08 (9.40)
BPD vs ASPD: t (p)	17.86 (.14)
BPD vs CIC-PD: t (p)	16.14 (.05)
BPD vs NPC: t (p)	41.70** (<.001)
ASPD vs CIC-PD: t (p)	-1.72 (.94)
ASPD vs NpC: t (p)	23.83** (.0005)
CIC-PD vs NpC: t (p)	25.56** (<.001)

Note: * p<.05; ** p<.001.

Influence of trauma history on abuse-related reactivity

The severity of childhood trauma was significantly positively correlated with the changes on SRNE, *Spearman`s rho = .29, p<.001*, the maladaptive and the adaptive modes, *Spearman`s rho = .29 and -.20, p=.002 and .02 respectively,* and BP, *Spearman`s rho = .22, p=.01.*

Influence of psychopathy

Attempts to predict abuse-related reactivity from the PCL-r total, factor 1 or 2 or facet 1 to 4 did not reveal any significant results.

DISCUSSION

To our knowledge, this is the first study to assess the impact of traumatic reminders on patients with BPD and ASPD on a broad range of outcome measures i.e. self-reported emotions, cognitive constructs, psychophysiology and implicit self-abuse association. Our hypothesis of a stronger reaction to abuse-related stimuli in BPD-patients was confirmed, both on a direct level (i.e. self-reported negative emotions and schema modes) and on an indirect level (physiological indices except frowning and implicit cognitive abuse-related cognitions). To our best knowledge, only one previous study (Arntz, Klokman, & Sieswerda, 2005) tested the impact of traumatic reminders on self-reported emotions and also found self-reported emotional hyperresponsivity in BPD-patients. Schmahl et al. (2004) were the only to assess the impact of abusive reminders on physiological reactivity in BPD and also found BPD-patients to respond with greater SCR to abandonment scripts. As far as we know, this is the first study to elaborate the evidence of trauma-related emotional hyperresponsivity in BPD to an indirect cognitive level. Other studies on emotional reactivity in BPD-patients mainly focused on general emotional reactivity (Herpertz, Werth, Lukas, Qunaibi, Schuerkens et al., 2001; Herpertz, Gretzer, Muhlbauer, Steinmeyer, & Stass, 1998; Herpertz, Kunert,

Schwenger, & Sass, 1999; Herpertz, Schwenger, Kunert, Lukas, Gretzer et al., 2000; Koenigsberg, Harvey, Mitropoulou, Schmeidler, New et al., 2002; Levine, Marziali, & Hood, 1997) and yielded conflicting results. This might suggest that BPD-patients are not characterized by a general emotional hyperresponsivity as Linehan (1993) suggested, but that the emotional reactivity pattern of BPD patients depends on the emotion that is targeted.

Although abuse-related physiological hyperresponsivity seems to characterize BPD, facial activity was an exception to this since frowning diminished in BPD-patients. Herpertz et al. (2001) and Renneberg, Heyn, Gebhard, and Bachmann (2005) also demonstrated little facial frowning activity in BPD-patients when viewing pleasant or unpleasant slides. Following Herpertz et al. (2001), we think this might reflect a restrictive expression and communication of emotions in BPD. Other possible interpretations are that BPD-patients lack facial expressions because they were often punished for expression of emotions in childhood (Linehan, 1993), or that this dissociation between facial expression and autonomic nervous system responses has the function of emotionally detaching them from the pain they feel (Arntz et al., 2005; Young et al., 2003).

In contrast to our expectations, ASPD-patients did not report a lower increase in negative affect than the BPD-patients. Thus, there is no evidence that ASPD-patients would deny or underreport the increase of negative affect after confrontation with abuse-related stress.

The premise of comparable impact of traumatic stimuli on an indirect level in BPD and ASPD-patients only received partial confirmation; ASPD-patients were comparable to BPD-patients regarding indirect cognitive reactivity, but both groups showed opposed psychophysiological patterns. The hyperresponsive implicit self-abuse association of BPD and ASPD-patients might suggest a strong developed abuse-related cognitive schema or a cognitive preoccupation with malignant others. The strength of self-abuse association after the abuse-related induction was comparable in BPD and ASPD-patients and much higher than the NpCs. Furthermore, ASPD-patients had a much higher baseline level of self-abuse association than the BPD group. This indicates that in BPD-patients, the self-abuse association is mostly induced by the abuse-related movie fragment, while in ASPD-patients the self-abuse association is strong even apart from the induction.

Regarding psychophysiology, BPD-patients reacted to the abuse stimuli with an increase in blood pressure and sympathetic responsivity and a decrease in frowning, while the opposite pattern was seen in ASPD. Although studies on emotional reactivity in ASPD-patients mostly find these patients to be characterized by physiological under-arousal (Hare, 1982; Herpertz et al., 2001; Ishikawa, Raine, Lencz, Bihrle, & LaCasse, 2001; Patrick, Zempolich, & Levenston, 1997; Raine, 1993) the physiological reactivity of the ASPD-patients in the current study did not differ from the non-patients. Consequently, the current data suggest that the ASPD-patients show a non-deviant physiological pattern in reaction to abuse-related stimuli. This is particularly remarkable given both BPD and ASPD had a more severe childhood trauma history and suggests a rather cool and controlled abuse-related reactivity of ASPD-patients. Both ASPD and non-patients responded with a lack or even a reduction of autonomic responses, but increased frowning.

This might suggest that the perpetrators in the movie-fragment elicited aversion and moral disgust in the ASPD-group and non-patients. There are indications that moral disgust is associated with diminished autonomic physiological activity (Sherman, Haidt, & Coan, Submitted for publication). Additionally, pedophilia is highly negatively stigmatized in forensic environments, which could explain why this moral aspect might have overruled the emotional pain caused by confrontation with the abusive stimuli in ASPD-patients.

CIC-patients were hyperresponsive in self-reported negative affect and in blood pressure, and their levels of reactivity were mostly in between that of BPD and ASPD. Possibly, this moderate abuse-related emotional reactivity reflects a general emotional vulnerability rather than a specific abuse-related vulnerability.

Several limitations have to be considered in interpretating our results. First, not enough female antisocial and male borderline patients were included in the current study to assess all group and gender interactions. Gender might also have influenced the reactivity on the film fragment since it depicted abuse of a young girl. Unfortunately, women that are antisocial but not borderline and borderline men that are not antisocial are quite rare in practice and therefore very difficult to recruit. Second, group membership and severity of abuse appeared to be highly correlated. There were not enough NpC`s with elevated abuse scores and not enough patients with low abuse scores to use trauma level as a covariate in the analyses. This prevented testing whether the personality disorder diagnoses or abuse severity was more important in predicting abuse-related stress reactivity. Nonetheless, correlational results indicated that the severity of childhood abuse was strongly related to several abuse-related reactions. Although we found clear diagnostic patterns of abuse-related reactivity, it cannot be ruled out that the emotional reactivity pattern to the abusive reminders merely depends on the severity of abusive events in one's past. Third, the lack of findings of the level of psychopathy on abuse-related reactivity might be due to the low number of psychopathy scores we had available. Therefore, replication studies with a larger number of psychopathy scores are needed. Finally, the use of personalized scripts as trauma reminders could have increased the emotional impact on the participants and might have excluded the possibility of elicitating moral disgust. On the other hand, non-standardized stimuli diminish the comparability of impact between participants. Also, it might be difficult to construct personalized abusive scripts in non-abused participants.

In sum, this study demonstrated that BPD-patients react with stronger intensity to abuse-related stimuli as compared to patient- and non-patient control groups. More specifically, they reported a stronger increase in negative emotions than the NpCs and schema modes than the CIC group and the NpCs after viewing a trauma related film fragment. Furthermore, they displayed a stronger increase in BPD than the ASPD-group and sympathetic responses than the ASPD and CIC-groups. While childhood trauma plays a central role in the aetiology of both BPD and ASPD-patients and direct comparison of self-reported negative emotions and schema modes and implicit cognitive reactivity did not reveal significant differences between these two groups, BPD-patients showed a stronger physiological reactivity. These findings contribute to knowledge on emotional responsivity and on disentangling BPD from ASPD. In the long term, they help increase insight

into the reactivity of these patients to abuse-related stimuli, which are often encountered in daily life situations and presented in therapy that could be effective in making people more resilient to confrontation with reminders of past traumatic events.

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PART 3

ANGER

Chapter 10

How to push someone's buttons:
A comparison of four anger induction methods

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ABSTRACT

This study compared the effects of four ways of inducing anger: film, stress interview, punishment and harassment. Sixty-four healthy participants were randomly assigned to one of these conditions. Effects were examined by means of self-report and physiological measures (blood pressure, heart rate, skin conductance level and skin conductance response). All four methods produced comparable levels of self-reported anger, while harassment and interview produced the largest cardiovascular effects, and electrodermal activity increased more in reaction to harassment, interview and punishment conditions compared to film. Thus, physiological reactivity was especially increased by anger induction methods that included personal contact (harassment and interview). Regarding specificity of self-reported emotions, fear and frustration were the only emotions out of nine non-target emotions that increased in comparable degree to anger following film, interview and punishment, while harassment did produce more self-reported anger than fear. Possible explanations and further recommendations are discussed.

INTRODUCTION

This study started from a simple question: What is the best way to make someone angry in the lab? The use of anger induction methods has allowed researchers to directly investigate the correlation between anger and a variety of other variables, including type A behaviour (e.g., Malatesta-Magai, Shepard, Jonas, & Culver, 1992), brain functioning (e.g., Kimbrell et al., 1999), hormonal influences (e.g.,Van Goozen, Frijda, Wiegant, Endert, & Van de Poll, 1996), gender (e.g., Gilbert & Thompson, 1999), and responses to emotional stimuli by psychopaths (e.g., Pham, Vanderstukken, Philippot, & Vanderlinden, 2003). Prior laboratory inductions of anger have relied largely on methods using deception, scripts, hypnotic suggestion or facial feedback. Unfortunately, the rationale behind the choice of a specific anger induction method often remains obscure. Moreover, there are hardly any studies directly comparing the effectiveness of more than one anger induction method. Presumably therefore most researchers in the field base their choice of induction method on face validity or personal experience. The use of suboptimal induction methods, however, can substantially decrease the strength of the findings.

Standardization of anger induction methods could significantly improve the methodology of anger studies. Until now, this issue has remained largely unaddressed. In an attempt to fill this gap, this study aims to directly compare the relative effects of four ways of inducing anger: film, stress interview, punishment and harassment. These methods were chosen on the basis of effect size calculations in published papers. All these anger induction methods have showed to successfully induce anger (Dimsdale, Stern, & Dillon, 1988; Garcia-Leon, Reyes del Paso, Robles, & Vila, 2003; Gilbert & Thompson, 1999; Gross & Levenson, 1995; Malatesta-Magai et al., 1992; Philippot, 1993; Stemmler, 1997). Further considerations for these specific methods are that a film can be readily standardized; both film and interview are easy and quick to apply and are without deception or manipulation; and interview and harassment are highly ecologically valid methods to induce subjects` physiological responses similar to stressors in daily life (Dimsdale et al.,

1988; Gross & Levenson, 1995; Philippot, 1993). Also, the four anger induction methods under study were selected for their future applicability to patients in mental health care settings, providing the opportunity to address anger related pathology in patients with disturbed aggression regulation.

Although affective processes are often assessed via self-reports, it is generally recognized that self-reports may be biased by such factors as social desirability or demand characteristics, or may simply be insensitive to faint fluctuations of affect. This could be especially the case with anger, because anger is a complex emotion that is not easily acknowledged or recognized, partly due to its stigmatized value in society (Dovidio, Kawakami, & Beach, 2001). Incorporating measures other than self-report (the so-called indirect measures) can also increase the external validity (Dovidio et al., 2001; Engebretson, Sitora, Niaura, Edwards, & Brown, 1999). Among the most commonly used indirect measures of emotions, are psychophysiological variables (Mucha, Pauli, & Weyers, 2006), which may reveal emotional states even when the participant does not want this to happen (cf. lie detector, see Douglas, 1991)[1]. Several physiological changes in autonomic nervous system activity are associated with the emotion of anger, including elevated heart rate, facial muscle changes such as increased activity in corrugator suppercilli (frowning) and decreased activity in zygomaticus major (smiling), elevated skin conductance responses and especially rising blood pressure (Cacioppo, Klein, Berntson, & Hatfield, 1993; Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000; Ekman, Levinson, & Friesen, 1983; Jäncke, 1996; Roberts & Weerts, 1982; Schwartz, Weinberger, & Singer, 1981; Sinha, Lovallo, & Parsons, 1992; Sinha & Parsons, 1996). Since these responses are not specific indicators for anger but also occur as a consequence of fear or sadness (Cacioppo et al., 1993; Cacioppo et al., 2000; Ekman et al., 1983; Jäncke, 1996; Roberts & Weerts, 1982; Schwartz et al., 1981; Sinha et al., 1992; Sinha & Parsons, 1996), it is advisable to combine these physiological assessment methods. An extra difficulty specific to the emotion of anger is that there appears to be a natural tendency for anger to co-occur with other negative emotions (Gross & Levenson, 1995; Philippot, 1993), making it hard to develop a `pure` anger induction. Therefore, it is important to evaluate the specificity of anger caused by these induction methods.

In sum, the aim of the present study is to compare the effectiveness of four anger induction methods: film, stress interview, punishment and harassment. Self-reported anger and physiological changes in blood pressure, heart rate, skin conductance level and skin conductance response will be assessed as indices of anger. Also, self-reported levels of non-target emotions will be measured in order to address the specificity of the elicited emotions by the anger induction methods. Furthermore, correlations between self-reported anger and physiological indices will be assessed, as well as the speed of recovery after a positive induction, and the influence of gender on all anger indices.

1 In this study, we also included an adapted version of the Extrinsic Affective Simon Task (EAST, De Houwer, 2003), in which we indirectly wanted to assess associations between the self concept and aggression. However, results indicate the reliabilities of the attribute categories were extremely low, and analyses of the reaction time and error percentages revealed no significant effects. This is in line with the finding that the EAST does not perform well as a measure of interindividual differences in attitudes or other associations in memory (De Houwer & De Bruycker, 2006). Details on the design and results of this task can be obtained with the corresponding author.

METHOD

Participants

Participants were 64 healthy volunteers (32 male, 32 female) who were recruited at Maastricht University, The Netherlands. Their mean age was 23.4 years (SD = 4.5). The group consisted of 57 students and 7 non-students, equally divided over the four conditions. All participants were randomly assigned to one of the four induction methods, with a 50% male and 50% female distribution in all categories. The resulting groups did not differ significantly in age, *Kruskall-Wallis*: χ^2 (3) = 3.34, p = .34.

Materials

Anger induction methods

Film. The selected film fragment for this study was the bully scene from `My Bodyguard` (Bill, 1980) in which a new boy at school is bullied and blackmailed by a group of classmates (duration: 10 minutes). The choice of this specific fragment was based on the study by Gross and Levenson (1995) who, out of 250 commercial movies, selected 8 segments assumed to specifically induce anger and had them viewed by 494 raters. `My Bodyguard` was chosen over `Cry Freedom`, because it produced a higher hit rate indicative of greater specificity of the elicited anger emotion. The following instruction was given (from Philippot, 1993): ``We are going to show you a film fragment. We are interested in how the scenes themselves make you feel. Therefore, your ratings should reflect the impact of the segment on you, rather than your feelings due to other factors, such as the weather or personal problems. We are interested in how this film segment makes you feel rather than how you think you should feel or how you think others would feel.``

Stress interview. We used the stress interview as proposed by Dimsdale et al (1988), who demonstrated that this technique promptly led to a much higher elevation of blood pressure. Similar interview techniques were used by e.g., Burns, Kubilus and Bruehl (2003) and Malatesta-Magai et al (1992). In this interview, participants recall and verbally describe an event in the past that generated a strong emotion of anger. The interview is an intense, friendly discussion in which the interviewer is at all times active and encourages the subject to go into some detail about the nature of the stressor, how (s)he got into this particular trouble and what (s)he thinks of him/herself as a result. This way, the stress interview is designed to maximize the subject's ability to recollect and recount emotionally charged material, so that his/her emotional expressivity has high authenticity and immediacy. The instruction to the interview was as follows: ``We are going to do a brief interview for 10 minutes about certain emotions you experienced in the past. I would like you to tell me about a situation in the past that made you very angry. Could you try to remember such a situation and tell me about it in detail? How did this situation make you feel? What did you want to do?``. Rather than using a standardized set of questions, the experimenter tailored follow-up questions to the specifics of the aversive situations being discussed. Also, the interviewers used emphatic confrontation (e.g., `That must have been very hard on you`), and made sure the anger-evoking situation or experienced anger remained the central theme of the interview.

Punishment. Participants assigned to this condition had to carry out a frustrating task, while receiving feedback on their performance. The frustrating task was based on `Trivial Pursuit`, a computer game in which participants were posed general knowledge questions and forced to choose between two answers. The Trivial Pursuit task took 10 minutes. Participants were told either that they did badly (failure feedback) or well (success feedback). Frustration was induced by manipulating the feedback information in such a way that subjects lost 50% of the trials, regardless of their answers. Furthermore, this feedback was provided immediately in a visual and auditory way through the presentation of a red cross on the computer screen and an unpleasant loud tone (white noise of 95 db) through a headphone. A pilot study in a student population demonstrated participants often expressed irritation toward this task. The instruction of this task was: ``We are going to do a Trivial Pursuit task. There will appear general knowledge questions on the computer screen with two possible answer categories. You can answer the question by pressing one of the corresponding figure keys. You will receive feedback on this answer in two ways: there will appear a `wrong` or `right` message on the computer screen, and you will be exposed to a loud noise through the headphone if your answer is incorrect. We do this to make sure you are aware that you made a mistake, and you will try to avoid making more mistakes in the next questions.`

Harassment. Subjects had to perform a frustrating task called `Trivial Pursuit` (identical to that of the punishment condition). Two female experimenters conducted the session, one of whom was identified to the subject as the supervisor, and the other as her student. At a certain point, the supervisor left the laboratory, under the pretend of giving the student the opportunity to practice her skills as an experiment leader. Subjects received the following instruction: ``We are going to do a Trivial Pursuit task. There will appear general knowledge questions on the computer screen with two possible answer categories. You can answer the question by pressing one of the corresponding figure keys. There will appear `wrong` or `right` feedback on the computer screen. Research has demonstrated this task serves as a measure of intelligence. At the end of this task, you will receive an intelligence score. To make sure you will do your best, you can double your fee for participation if you score above a certain cut-off. It is very important that you try to perform the task to your best capabilities.`` Harassment was manipulated through four negative verbal comments made by the student at predetermined times; ``You really should try harder, otherwise this will come to nothing`` (after 1 minute), ``Can't you sit still? This way we will not be able to measure anything!`` (after 3 minutes), ``Well, you can forget about those 40 euros`` (after 6 minutes). At the end of the test, participants were given the following feedback: ``You have only achieved an average score on this intelligence test. This is totally unusual and unacceptable for a university student. Perhaps your intellectual capabilities are insufficient to complete your degree successfully. This score is not sufficient to double your fee`` (for similar procedures see e.g., Gilbert & Thompson, 1999; Jäncke, 1996; Van Goozen et al., 1996). In total, this harassment procedure took at about 20 minutes[2].

2 Further information on the design of these methods can be obtained with the corresponding author.

Dependent variables

Self-report measure. Participants rated their current emotional state right after the inductions on a 45 item 100 mm VAS scale questionnaire, consisting of ten subscales based on a priori face validity selection: anger, fear, embarrassment, frustration, annoyance, sadness, loneliness, impatience, dejection and alertness (see Appendix A at the end of this chapter). Internal consistencies of these subscales were good (mean Chronbach`s Alpha = .88, range .81 to .93[3]).

Psychophysiological responses [4]

Blood pressure (BP). Systolic and diastolic BP were recorded using the Omron M5-I, via a standard cuff that was placed on the subjects` right arm above the elbow. To get a reliable mean value, blood pressure was measured four times in a row, with intervals of 15 seconds, right after the anger induction (for a similar procedure see Schmahl et al., 2004). Reliability of the average blood pressure scores was excellent; Chronbach`s Alpha diastolic blood pressure = .97 (neutral phase), .94 (anger phase), .95 (positive phase); Chronbach`s Alpha systolic blood pressure = .97 (neutral phase), .97 (anger phase) and .96 (positive phase).

Heart rate (HR). To record the electrocardiogram (ECG), Blue sensor electrodes were attached over the lower rib on the left side of the trunk and to the subjects` chest to record a lead II electrocardiogram. Heart rate was expressed as the number of beats per minute (bpm).

Skin conductance level (SCL) and skin conductance response (SCR). To monitor palm sweat gland activity, Ag/AgCl electrodes (8 mm diameter) filled with isotonic paste were attached to the volar surface of the medial segment of the middle and ring fingers of the non-dominant hand. A Galvanic Skin Response (GSR) coupler supplied a constant 0.5 Voltage to assess skin conductance level and response. SCR was defined as every response larger than .02 µS and smaller than 30 µS.

Heart rate, SCL and SCR were recorded using the Vitaport III system, a portable continuously measuring physiological device, and analyzed off-line by means of a specially designed computer program. Skin conductance was sampled with a frequency of 16 Hz, and HR and EMG with a 1024 Hz frequency. Blood pressure was measured immediately after every phase, while the other physiological indices (heart rate, SCL and SCR) were continuously monitored. Dependent variables are expressed as the mean responses of these four physiological parameters per experimental phase.

3 Internal reliability of the frustration subscalecould not be calculated since this subscale only consisted out of 3 items. It was decided to maintain frustration as a separate scale since comparing anger and frustration was of importance in this study.

4 In the present study facial EMG over corrugator supercilii (involved in frowning) and zygomaticus major (smiling) were also measured. However, due to technical failure, these EMG results are not reported in this manuscript.

Procedure

All subjects were randomly assigned to one of the four anger induction methods. In order to exclude order and carry-over effects of elicited emotions (as demonstrated by Engebretson et al., 1999), only one anger induction method was administered to one participant. After obtaining informed consent, subjects were attached to the equipment for the physiological recordings. The experiment was divided into three different experimental phases: (i) the neutral phase, in which participants had to watch a movie about monkeys (10 minutes, used as baseline) (music by Oldfield, 2001), (ii) the anger manipulation condition, and (iii) the positive phase, in which participants were shown a fragment of a Mr. Bean movie (10 min). This last phase was included to minimize lasting impact of the anger induction on the participants. After each phase, participants filled in the self-report measure, while their blood pressure was recorded. Other physiological variables were measured continuously throughout the experiment. Finally, the experimenter removed the electrodes, and each subject was given the credit certificate and informed as to the true nature of the study. During the debriefing, the experimenter probed the participant regarding any suspicion that may have been present during the experiment, by asking them what they thought the study was about and which emotions were targeted. Since participants in the interview condition were specifically asked to tell about anger they experienced in the past, it was obvious this subgroup was aware of the central place of anger in this study. However, it was not mentioned to them that the goal of the present study was to make them feel angry again.

RESULTS

Debriefing

The exit interview revealed that one man expressed doubts about the cover story of the harassment condition. His data was removed prior to all analyses, and replaced by those of a new participant.

Baseline values

Mean scores on all responses for each phase and each anger induction method are shown in table 1. An alpha of .05 was used for all statistical tests. Baseline values of all dependent variables were compared between anger induction methods by means of ANOVAs and revealed no main effect of anger induction method on self-reported anger or any of the physiological indices, *ps*>.21. This indicated that participants of the 4 anger inductions methods did not differ significantly from each other in these indices before the manipulations began.

Table 1: Mean and elevation scores for all dependent variables in each anger induction method

Induction method	Phase	SR [a] anger	Heart Rate	Systolic BP [b]	Diastolic BP	SCL	SCR [c]
		Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)	Mean [d] (sd)	Mean [d] (sd)
Film	Neutral	14.43 (7.72)	77.82 (14.48)	113.47 (13.37)	74.63 (7.80)	7.33 (4.07)	5.06 (2.93)
	Anger	29.26 (18.13)	74.92 (13.71)	113.27 (12.24)	76.03 (8.79)	8.11 (3.75)	4.46 (2.67)
	Positive	15.55 (8.85)	74.12 (10.54)	112.42 (12.08)	76.83 (6.74)	6.91 (3.48)	5.47 (2.64)
	A – N [d,e]	14.83 (16.33)	-2.80 (6.00)	-.20 (3.78)	1.41 (5.73)	.78 (2.51)	-.60 (1.25)
Interview	Neutral	17.02 (8.04)	75.97 (10.21)	113.61 (12.05)	71.16 97.54)	6.78 (2.96)	4.86 (2.29)
	Anger	27.06 (15.19)	79.11 (10.04)	117.66 (14.49)	75.86 (7.76)	7.74 (2.63)	8.66 (1.37)
	Positive	18.77 (10.48)	65.18 (19.62)	113.11 (12.44)	73.36 (7.62)	6.72 (2.23)	4.55 (1.55)
	A – N	10.04 (9.42)	3.14 (6.42)	4.05 (5.38)	4.70 (4.51)	.96 (1.63)	3.80 (2.65)
Punishment	Neutral	20.66 (8.08)	74.04 (8.93)	111.08 (9.44)	72.53 (5.70)	5.68 (2.63)	4.73 (3.06)
	Anger	29.39 (10.03)	69.82 (6.62)	111.69 (10.43)	71.94 (5.55)	7.72 (2.32)	9.14 (2.10)
	Positive	23.52 (8.63)	67.60 (7.23)	110.41 (10.87)	72.41 (5.03)	6.49 (2.61)	5.07 (2.39)
	A – N	8.73 (8.85)	-4.22 (6.07)	.61 (4.65)	-.89 (3.33)	2.04 (2.13)	4.41 (3.25)
Harassment	Neutral	19.28 (8.13)	73.46 (6.99)	115.25 (20.00)	74.52 (13.90)	5.79 (3.04)	4.82 (2.91)
	Anger	33.11 (17.36)	75.75 (8.42)	120.98 (21.86)	78.18 (14.27)	7.15 (2.81)	8.19 (1.76)
	Positive	20.15 (12.49)	71.41 (6.84)	117.59 (22.04)	75.20 (14.30)	6.32 (2.15)	5.56 (1.99)
	A – N	13.84 (17.33)	2.10 (3.40)	5.06 (5.71)	3.70 (3.09)	1.36 (1.12)	3.36 (2.30)
Total	Neutral	17.85 (8.81)	75.30 (10.40)	113.35 (14.00)	73.21 (9.16)	6.40 (3.22)	4.87 (2.75)
	Anger	29.71 (15.33)	74.90 (10.36)	115.90 (15.45)	75.50 (9.66)	7.69 (2.88)	7.61 (2.72)
	Positive	19.50 (10.39)	69.58 (12.40)	113.38 (14.91)	74.45 (8.97)	6.61 (2.63)	5.16 (2.17)
	A – N	11.86 (13.47)	-.49 (6.34)	2.34 (5.30)	2.28 (4.69)	1.28 (1.95)	2.73 (3.13)

Note: [a] self reported; [b] blood pressure; [c] SCR data were multiplied by 100 in order to make the scores more surveyable; [d] positive scores indicate increases in anger indices, and negative scores indicate decreases in anger indices; [e] anger minus neutral phase.

Elevation scores

To test whether the anger inductions as a whole were indeed effective, paired sample t-tests were used to assess increases in all dependent variables from baseline to anger phases (see table 2). Overall, self-reported anger, SBP, DBP, SCL and SCR significantly increased following the anger inductions. In contrast, HR slightly but unsignificantly decreased from the neutral to the anger phase. When examining the different anger induction methods, self-reported anger increased significantly in reaction to all anger induction methods, while harassment was the only condition that caused a significant increase in all physiological indices. Interview caused all physiological indices but HR to increase, and SCL and SCR are the only physiological markers that increased in reaction to harassment. Film did not cause a significant increase in any of the physiological indices (see table 2).

Table 2: Effect sizes of the elevation scores of the dependent variables per anger induction method

		SR [a] anger	HR [b]	SBP [c]	DBP [d]	SCL [e]	SCR [f]
Film	t	3.63*	-1.87	.22	.98	1.24	1.94
	p	.002	.08	.83	.34	.23	.07
	ES [g]	.68	-.43	.06	.25	.31	.45
Interview	t	4.26*	1.96	3.01*	4.17*	2.35*	5.72*
	P	.001	.07	.009	.001	.03	<.001
	ES	.74	.45	.61	.75	.52	.83
Punishment	t	3.95*	-2.78*	.52	-.71	3.83*	5.42*
	p	.001	.01	.61	.49	.002	<.001
	ES	.71	.58	.13	-.18	.70	.66
Harassment	t	3.20*	2.72*	3.74*	4.90*	4.68*	6.06*
	p	.006	.02	.002	<.001	<.001	<.001
	ES	.64	.57	.69	.78	.77	.84
Total	t	7.05*	-.50	3.39*	3.94*	5.23*	7.05*
	p	<.001	.62	<.001	<.001	<.001	<.001
	ES	.66	.06	.42	.44	.55	.66

Note: [a] self reported; [b] heart rate; [c] systolic blood pressure; [d] diastolic blood pressure; [e] skin conductance level; [f] skin conductance response, [g] effect size; * significant at p<.05

Furthermore, effect sizes based on Pearson correlations were calculated for each dependent variable for all anger induction methods (see table 2). Following Cohen (1992) and effect size of r =.10 can be interpreted as a small effect, while an effect size of r = .30 reflects a medium effect, and an effect size of

r =.50 a large effect. The absolute effect sizes of the current study vary between .06 and .84. Effect sizes of self-reported anger are high in all anger induction methods, and harassment is the only condition that displays large effect sizes on all physiological indices.

Next, differences in increases of the dependent variables between the four anger induction methods were assessed. ANOVAs of the elevation scores (anger phase minus neutral phase) for each dependent variable, did not reveal a main effect of anger induction method for increases in self-reported anger, $F(3,60) = .75$, $p = .53$, or SCL, $F(3, 59) = .27$, $p = .27$, indicating that increases in self-reported anger and SCL following the anger inductions did not differ between the anger induction methods. As can be seen in table 3, a main effect of anger induction method was obtained for HR, SBP, DBP and SCR. Contrasts between the four conditions were assessed by means of post-hoc analyses (LSD tests), and presented in table 3. The results of the HR scores revealed a greater elevation of heart rate in the interview and harassment conditions compared to film and punishment. Systolic blood pressure rose more in the harassment condition compared to film and punishment, and more in the interview condition compared to film. Diastolic blood pressure increased more in the interview and harassment conditions compared to the punishment condition, and in interview condition compared to film. Increases in SCR were higher in the interview, punishment and harassment conditions compared to film. Other post-hoc contrasts were not significant.

Table 3: Main effects of anger induction method on the elevation scores of all dependent variables, and post-hoc contrasts between anger induction methods.

Dependent variable	Main effect anger induction method		Film vs interview		Film vs punishment		Film vs harassment		Interview vs punishment		Interview vs harassment		Punishment vs harassment	
	F [e]	p	t	p	t	p	t	p	t	p	t	p	t	p
SR [a] anger	.75	.53	1.00	.32	1.27	.21	.21	.84	.27	.79	-.79	.43	-1.07	.29
Heart Rate	6.83*	<.001	-2.99*	.004	.72	.48	-2.56*	.01	3.71*	<.001	.43	.67	-3.28*	.002
Systolic BP [b]	4.94*	.004	-2.38*	.02	-.45	.65	-3.31*	.002	1.92	.06	-.94	.35	-2.86*	.006
Diastolic BP	4.90*	.004	-2.18*	.03	1.32	.19	-1.49	.14	3.50*	.001	.69	.49	-2.81*	.007
SCL [c]	5.02	.27	-.26	.80	-1.85	.07	-.85	.41	-1.59	.12	-.59	.57	1.00	.33
SCR [d]	13.68*	<.001	-5.07*	<.001	-5.77*	<.001	-4.57*	<.001	-.70	.49	.50	.62	1.20	.24

Note: [a] self reported; [b] blood pressure; [c] skin conductance level; [d] skin conductance response; [e] df anger induction method = 3, df error = 60; * significant at $p < .05$

Correlations between the dependent variables

As is shown in table 4, changes in self-reported anger from baseline to post-induction hardly correlated with changes in HR, blood pressure, SCL or SCR. Correlations between physiological indices within the subsystems of cardiovascularity (HR, SBP and DBP) and electrodermality (SCL and SCR) are significant. However, these correlations were relatively low, explaining only 6.67% of the variance between SCL and SCR, 12% between SBP and DBP, 18.5% between DBP and HR, and 12% between SBP and HR.

Table 4: Correlations between elevation scores of self reported and physiological measures

	SR Anger	Heart rate	SBP	DBP	SCL	SCR
SR [a] anger	1					
Heart rate	-.03	1				
SBP [b]	-.07	.35*	1			
DBP [c]	.03	.43**	.35**	1		
SCL [d]	-.21	-.08	-.07	-.16	1	
SCR [e]	-.04	.21	.17	.16	.26*	1

Note: [a] self-reported; [b] systolic blood pressure; [c] diastolic blood pressure; [d] skin conductance level; [e] skin conductance response; * p <.05, ** p <.001.

Specificity of emotions

To assess the specificity of the emotions induced by the anger inductions, the self-report scales of fear, embarrassment, frustration, annoyance, sadness, loneliness, impatience, dejection and alertness (further referred to as non-target emotions) were assessed. The 9 elevation scores (post minus baseline) of the non-target self-reported emotions were subjected to a MANOVA with anger induction method as between and emotion subscales as within subject factors. This analyses revealed a significant multivariate effect of intercept, $F\ (9, 52) = 6.65, p < .001$, indicating that there were significant changes in these non-target emotions from baseline to post anger phase. There was no main effect of condition, $F\ (3,60) = 1.99, p = .13$. The interaction between anger induction method and emotion type produced a marginally significant trend (discussed below), $F\ (24, 165) = 1.56, p = .06$. All but one (loneliness) subscales increased significant, *univariate F (1,60) `s > 8.41, ps <= .005*. Paired t-tests for the elevation of anger compared to the changes in the non-target emotions, showed significantly greater elevation of anger compared to all non-target emotions, with exception of frustration and fear (see table 5). It can be concluded that the elevation of anger was significantly higher than the elevation of the other emotions except for frustration and fear. However, paired sample t-tests within the separate anger induction methods revealed the increase of anger in the harassment condition was significantly higher than that of fear, $p = .04$, whereas the other induction methods had non- significant differences between fear and anger changes.

Table 5: Difference in elevation scores between anger and all non-target emotions

	Mean diff [a] (sd)	t	p
anger vs. fear	2.51 (14.83)	1.35	.18
anger vs. embarrassment	4.13 (15.98)	2.07*	.05
anger vs. frustration	-.37 (21.57)	-.14	.89
anger vs. annoyance	3.85 (12.11)	2.54*	.01
anger vs. sadness	5.65 (9.25)	4.89*	<.001
anger vs. loneliness	8.46 (14.41)	4.70*	<.001
anger vs. impatience	3.09 (12.59)	1.96*	.05
anger vs. dejection	4.93 (9.18)	4.29*	<.001
anger vs. alertness	8.66 (16.91)	4.09*	<.001

Note: [a] mean difference between anger elevation score (anger phase – neutral phase) and non-target emotions elevation score (anger phase – neutral phase); * p<.05

Recovery

In order to assess whether recovery was complete for all dependent variables, paired sample t-tests were performed between the baseline levels and the levels in the positive phases. Results indicate that level of self-reported anger and DBP were not completely recovered in the positive block, *t (63) = -2.2, p = .03 and t (63)= -2.6, p = .01*, respectively. The opposite pattern emerged for HR level, that was significantly lower in the positive phase compared to the neutral phase, *t (63) = 4.74, p <.001*. Systolic BP, SCL and SCR returned to baseline after the positive phase, *t (63)= -.04, p = .97; t (63)= -.90, p = .37 and t (63)= -1.08, p = .28*, respectively. Separate ANOVAs of change scores from baseline to the positive block revealed no main effect of induction method, indicating that levels of recovery did not differ between the four conditions for any of the dependent variables.

Gender

Finally, the influence of gender on the present data was analyzed for all anger indices. ANOVAs were performed with the separate elevation scores of the anger indices as dependent variables, and anger induction method and gender as between subject factors. None of the induction method x gender interactions were significant, which demonstrated that men and women had comparable elevation scores on self-reported anger and physiological indices in all induction methods[5].

5 Analyses did revealed a main effect of gender on SCR, indicating that in general women had higher numbers of SCR than men, *mean men = 1.94, sd = 3.2; mean women = 3.5, sd = 3.2; F (3, 56) = 7.37, p = .009.*

DISCUSSION

To the best of our knowledge, this is the first study to directly compare the effects of four ways of inducing anger: film, stress interview, punishment and harassment. Results demonstrate that all of the four methods are indeed effective anger elicitors with respect to self-report, in that they result in a significant increase from neutral to anger phases for self-stated anger, while harassment is the only condition that causes a significant increase in all physiological indices. When looking at self-reported anger, all anger induction methods appeared equally effective. With respect to cardiovascular indices (HR, SBP and DBP), harassment and interview were more successful than film and punishment. Additionally, harassment, interview and punishment produced larger electrodermal effects than the film condition. Both interview and harassment are most consistent in producing the highest level of physiological responses, while film produces the lowest overall physiological increases.

We hypothesize the greatest merit of both harassment and interview methods is their high ecological validity; they best resemble possible self-encountered situations in daily life in which people are being criticised on their performance in an intrusive manner (comparable to the harassment method), or recall a negative situation in their past (comparable to the interview method). Moreover, harassment and interview include more personal contact between the subject and the experimenter, possibly making it more difficult for the participant to disengage from these methods. Furthermore, the topic of the stress interview is individualized, maximizing the probability of autobiographical recall while the other induction methods are identical for all participants. In contrast, while a film clip can threaten an individual's cherished beliefs, values or attitudes, viewing a film usually implies that participants are merely observers of the emotions of another person and thus experience these emotions in a secondary manner, so it might be relatively easy to keep from feeling those emotions themselves. Also, the failure feedback in the punishment condition is computerized, making it less personal and therefore possibly less intrusive than the received negative feedback in the harassment condition. One theoretically interesting possibility is that the anger induction methods involving a personal interaction (interview and harassment) lead to a deep activation of the emotion, including physiological reenactment, while inductions not involving personal contact (film and punishment) only lead to a shallow activation of the emotion concept (cf. Niedenthal, Barsalou, Ric, & Krauth-Gruber, 2005). Further studies looking into the precise effective mechanisms of the anger inductions are warranted in order to evaluate why some inductions are more effective than others.

When comparing the strength of increases in the dependent variables with those of other studies that used comparable anger induction methods, cardiovascular indices increases in our harassment condition are lower compared to those in the studies by Anderson, Linden, & Habra (2005), Garcia-Leon et al. (2003) and Van Goozen et al. (1996) (mean increase our study = 2; 5; 3.7; mean increase other studies = 7.6; 13; 5.5, for HR, SBP and DBP respectively). Compared to the study by Dimsdale et al. (1988), our stress interview caused a smaller increase in SBP (4 compared to 20 mm) and DBP (4.7 compared to 15 mm). The overall increase of 11.86 on a 100mm VAS scale of self-reported emotions can be deemed

successful, following the guideline of Martin (1990) who states changes in self-reported emotions should at least be 10%. Other comparisons could not be made due to the lack of relevant studies, or the lack of baseline levels reports (e.g., Gross & Levenson, 1995; Philippot, 1993).

Explained variance percentages indicate that all separate physiological variables are valid in that they contribute in a unique way to the assessment of anger. Thus, it would not suffice to use only one measure as an anger marker, nor would it be advisable to reduce the number of physiological indices.

The very low or even lack of correlations between the dependent variables in the current study was remarkable. The observation that self-reported anger did not correlate with the physiological indices is often made in socially sensitive issues like anger (for an overview see Dovidio et al., 2001). A possible explanation for this discrepancy can be that self-report and physiological measures tap into different aspects of emotions; self-report is an explicit measure that is conscious and controllable, making it more susceptible for demand characteristics, while physiological indices are indirect measures that operate without cognitive awareness and therefore possibly better reflect direct emotional impact (Dovidio et al., 2001). This discrepancy between self-reported anger and physiology could also have been due in some part to the fact that anger was rated after the emotion inductions when recovery could already have been started, as opposed to the physiological indices that were assessed during the induction. The poor correlation between cardiovascular and electrodermal measures is compatible with previous findings (see e.g., Gendolla, Abele, & Krüsken, 2001). This discrepancy could be explained by the notion of `individual response theory`. This view holds that each subject reacts to various kinds of stress with increased activation in a specific autonomic system (Lacey & Lacey, 1958). Thus, the present findings may suggest anger does not have a unique autonomic response pattern associated with it, but some people react to it primarily with electrodermal activation, while other's cardiovascular system is predominately stimulated.

The finding that most of the negative non-target emotions also increased in reaction to the anger inductions, is in line with previous studies that have indicated anger often co-occurs with other negative emotions (Gross & Levenson, 1995; Philippot, 1993). However, only the elevation of frustration and fear was statistically comparable to that of anger, indicating quite high discriminant validity of the anger induction methods. There was no difference of specificity in emotion elevation between the four conditions. The fact that frustration increased in comparable levels to anger is not surprisingly given the close theoretical link between both emotions. As Dollard et al. (1939) stated in their frustration-aggression hypothesis: ``the occurrence of aggressive behaviour always presupposes the existence of frustration``, and ``the existence of frustration always leads to some form of aggression``(Dollard, Doob, Miller, Mowrer, & Sears, 1939, p. 1). Also, we want to emphasize that the current finding could only be detected because we used a fine-grained categorization of the self-report emotions. Therefore, the co-occurrence of anger and frustration is not problematic. The comparable level of increases in fear and anger as a consequence of the anger inductions is more problematic in light of emotion specificity. Other studies reported similar observations. For example, participants of Scherer & Tannenbaum (1986)`s study reported anger and fear were the negative emotions that were most often blended, and it was concluded anger and fear ``tend to occur

more frequently in combination with one another than singly`` (p. 304). The co-occurrence of anger and fear is also in line with Frijda's vision that these emotions are both appraised as threatening, while they are associated with different action tendencies; anger with arousal and the urge for removal of obstruction or offence, and fear with avoidance and freezing tendencies (Frijda, 1986,1988, 2005). Furthermore, also Berkowitz`s cognitive-neoassociationistic (CAN) model of anger generation posits a clear and present danger can lead to the coexistence of both fear and anger, with fear being reflective of the strong urge to flee from the threat (Berkowitz & Harmon-Jones, 2004). However, this drawback appears less of a problem within the harassment condition since anger did increase significantly more than fear in this condition. For the other 3 induction methods, it can not be ruled out that the current increases in physiological markers are due to fear or the combination of fear and anger. Therefore, in light of the specificity of emotions, for future studies aiming at inducing pure anger emotions, we suggest harassment should be the first choice of anger induction method.

Much research aimed at associating specific emotions with specific patterns of physiological activity. Despite the fact that these studies indicate that there is sufficient evidence for the existence of a set of autonomic differences between emotions (Levenson, 1992), these studies only give information concerning the *relative* difference in increases in physiological indices between emotions, e.g., diastolic blood pressure increases more during anger imagery than during sadness (e.g., Sinha et al., 1992; Sinha & Parsons, 1996). Therefore, in our study that assesses only the emotion of anger, physiological increases cannot be compared to those of other negative emotions, and we cannot fully justify that the current physiological arousal was caused by the emotion of anger per se.

It is important to realize that this study does not cover an evaluation of all existing anger induction methods. Rather, it must be seen as a selection of several methods that are used frequently and are reasonably feasible. This selection was hampered by the limited literature available on the topic. Also, the four anger induction methods under study were selected for their future applicability to patients with disturbed aggression regulation. In such populations, not all available anger induction methods are appropriate. For example, an anger induction method as the one used by Harmon-Jones, Sigelman, Bohlig, and Harmon-Jones (2003) who exposed university students opposed to a tuition increase to an editorial that argued for a tuition increase, would be less suitable. The method of Harmon-Jones et al. (2003) would, however, be a valuable alternative for inducing anger in most populations since it caused a significantly higher increase in anger compared to sadness and fear, indicating that this is a relatively pure anger induction method[6]. In addition, it has to be noted that the comparison of the four anger induction methods in this study is not absolute in nature since it only provides information on a specific stimulus of each method; basically it assesses the relative effectiveness of one particular film clip, compared to one

6 Since frustration and other anger-related emotions were not analyzed separately from anger, no conclusions can be drawn concerning the differentiation with these emotions.

particular interview method. The choice for the specific stimulus for each induction method was based on the available literature. Nevertheless, future studies with different stimuli might increase the efficacy of the methods studied here.

A further limitation of this study is that the sample was mainly drawn from a college-age population, making it unclear how effective these methods would be with other samples. For further studies it is recommended to investigate the duration of the induced mood states. Engebretson et al. (1999) presume mood effects can last between 10 and 30 minutes. However, a specific determination of this duration would be important in order to define the number of tasks that can be performed after the induction under the assumption of lasting influence of the induced mood state. Secondly, to further establish external validity it would be interesting to videotape the anger induction and let independent raters evaluate the facially expressed anger, or to investigate changes in behaviours as a function of the induced anger. Thirdly, further studies should investigate towards whom emotions of anger are directed (self vs. other). Fourthly, some aspects of anger inductions other than anger, such as talking activity in the interview or mental effort for solving the Trivial Pursuit task in the harassment and punishment conditions, could have contributed to the observed physiological reactivity. This is underscored in a study by Gendolla & Krüsken (2002) that demonstrated the increase in SBP was exclusively linked to task performance, and not to mood itself. Therefore, further studies are warranted that include extra phases in which participants only exhibit these activities without the anger-provoking aspect (e.g., talk about a neutral subject or perform a mental solving task), to study the unique contribution of the anger induction method to physiological responses. Finally, further efforts should be put into developing an effective indirect behavioural measure (comparable to the EAST).

In conclusion, the comparison of four often used anger induction methods, indicated that all methods reliably increased subjective feelings of anger, but that the methods differed in physiological reactivity of anger. Specifically, anger inductions methods that included personal contact (harassment and interview) produced more physiological reactivity than methods that did not (film and punishment by computer). We hope this study will stimulate further research directly comparing different emotion induction methods, which could in turn stimulate research applying these methods.

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APPENDIX A:

1. Fear (*angst*, N=2): terrified (*heel erg angstig*); anxious (*vol van angst*).
2. Embarrassment (schaamte, N = 1): embarrassed (*beschaamd*).
3. Frustration (*frustratie*, N = 1): frustrated (*gefrustreerd*).
4. Annoyance (*ergernis*, N = 1): annoyed (*geërgerd*).
5. Sadness (*verdriet*, N = 8): dispirited (*somber*); unhappy (*niet vrolijk*); sad (*verdrietig*); sorrowful (*heel erg verdrietig*); unhappy (*ongelukkig*); dejected (*neerslachtig*); sad (*bedroefd*); unpleasant (*onplezierig*).
6. Loneliness (*eenzaamheid*, N = 1): lonely (*eenzaam*).
7. Impatience (*ongeduld*, N = 2): agitated (*onrustig*); impatient (*ongeduldig*).
8. Dejection (*algemeen negatief*, N = 11): tensed (*gespannen*); dissatisfied (*ontevreden*); uneasy (*ongemakkelijk*); cold (*koud*); worried (*bezorgd*); not proud (*niet trots*); pessimistic (*pessimistisch*); dissatisfied (*ontevreden*); insecure (*onzeker*); weak (*zwak*); unenjoyable (*ongezellig*).
9. Alertness (*alertheid*, N = 9): energetic (*energiek*); interested (*geïnteresseerd*); fit (*fit*); alert (*alert*, this item was presented twice); attentive (*oplettend*); quick (*snel*); awake (*wakker*); surprised (*verbaasd*).
10. Anger (*woede*, N = 9): irritable (*lichtgeraakt*); quarrelsome (*twistziek*); aggressive (*agressief*); cross (*nijdig*); furious (*boos*); hostile (*vijandig*); combative (*strijdlustig*); infuriated (*furieus*); rebellious (*opstandig*).

Note: Total number of items = 45; Only the negative counterparts of the items are presented here, with the exception of alertness; Italic = original Dutch words

Chapter 11

Effects of induced anger in patients with antisocial personality disorder

Lobbestael, J., Arntz, A., Cima, M., & Chakhssi, F. Effects of induced anger in patients with antisocial personality disorder. *Submitted for publication.*

ABSTRACT

Background: Anger is the main deregulated emotion in patients with antisocial personality disorder (ASPD) and psychopathy (PP).

Aims: Examine emotional, cognitive and physiological correlates of anger and compare these between ASPD, PP and control groups.

Method: Assess the effect of anger induction on self-reported emotions and schema modes, psychophysiology and implicit reaction-time tasks measuring self-anger and aggressor-swearword associations. Participants (N=147) were patients with antisocial (with varying degree of PP, n=21), borderline (n=45) and cluster C personality disorder (n=35) and non-patient controls (n=35).

Results: Groups did not differ in self-reported anger. ASPD-patients displayed a decrease in heart rate and systolic blood pressure (SBP) and stronger implicit self-anger associations. ASPD-patients scoring low on affective PP reported less negative emotions and displayed more decrease in SBP.

Conclusions: ASPD-patients did not display a deviant self-reported anger but physiological hyporesponsivity and cognitive hyperresponsivity. This ASPD anger response might reflect a controlled predatory-like fight preparation.

INTRODUCTION

Due to the strong link between anger and aggression (Lish, Kavoussi, & Coccaro, 1996), anger plays a central role in both antisocial personality disorder (ASPD) and psychopathy (PP). While the relationship between ASPD and anger is not questioned, theoretical accounts on the psychopath's experience of anger differ widely; some assume they experience intense and chronic anger (McCord & McCord, 1964; Milon, 1981) and others suggest a lack of genuine anger following general poverty of affect in psychopaths (Cleckley, 1976). To our knowledge, no study assessed the effect of experimentally induced anger in ASPD-populations. Several studies investigated anger reactivity in PP but were contradictive: one study found self-reported anger in PP comparable to that of other groups (Pham, Philippot, & Rime, 2000) and one study found it to be stronger (Serin, 1991). Regarding anger-related psychophysiology, PP has been associated with higher electrodermal activity (Pham et al., 2000), a comparable level of blood pressure and lower facial activity (Steuerwald, B.L., personal communication). These conflicting results and the fact that these studies used student samples and hypothetical scenarios or observer paradigms to induce anger, makes it difficult to draw firm conclusions regarding anger reactivity of PP. Thus, very little is known about anger reactivity in antisocial and psychopathic individuals. Additionally, reliance on self-report may bias findings given ASPD-patients and psychopath's tendency to underreport and deny (de Ruiter & Greeven, 2000). The present study examined the influence of anger on (1) self-reported emotions, (2) anger-related schema modes, (3) physiological reactivity (heart rate, blood pressure, skin conductance level and response, and frowning), and on (4) associations between `self` and `anger`, and `aggressor` and `swearwords` by means of implicit association tasks. We compared an ASPD group (with varying degrees of PP), a

borderline personality disorder (BPD) and a Cluster C (Cl-C) patient group, next to a non-patient control group (NpC). We expected ASPD, and especially PP, to be associated with relatively higher responses on indirect than on direct anger measures, reflecting the denial tendencies of these groups.

METHOD

Participants

Data were analyzed from N=147 subjects, divided into four groups: patients with ASPD (n = 21), BPD (n = 45) or Cl-C personality disorder (n = 46) and NpCs without psychopathology (n = 35). Patients were recruited from community and forensic institutes of mental health care within the Netherlands and Belgium. General exclusion criteria were psychotic or bipolar disorder, age < 18 and > 55, intoxication by alcohol or drugs during testing, IQ below 80 and not being native speaker of Dutch. The non-BPD participants were not allowed to have more than two BPD criteria, and the non-ASPD participants were not allowed to have more than two ASPD criteria.

The characteristics of the study groups are presented in table 1. Testing of between group differences revealed that the ASPD group contained fewer women and the BPD group fewer men than the other groups and that the ASPD group was significantly lower educated. Further analyses of this study were corrected for gender, but not for education since a lower education level is inherent to the ASPD population (Robins, Tipp, & Pzybeck, 1991). The ASPD group had a significantly lower number of axis I disorders compared to the BPD and Cl-C groups, but the three patient groups did not differ with respect to number of axis II disorders. The ethical committee of the Academic Hospital of Maastricht (the Netherlands) approved this study. Before starting the study, all participants gave written informed consent.

Table 1: Comparison between the groups on the demographic measures (N=147).

	ASPD (n=21)	BPD (n=45)	CI-C (n=46)	NpC (n=35)	Statistics	P value
Gender					$\chi^2 = 15.14$	.002
men	16	12	17	16		
women	5	33	29	19		
Age	30.29	33.82	35.80	36.91	K-W[1]: $\chi^2 = 6.52$	.09
	(7.79)	(7.83)	(9.32)	(11.84)		
Education					K-W: $\chi^2 = 42.96$	<.001
no education	2	-	-	-		
primary school	10	5	2	-		
high school	6	17	10	6		
secondary education	3	19	21	16		
higher education	-	4	13	13		
Number axis I disorders	1.67	3.18	3.09	-	K-W: $\chi^2 = 15.31$	<.001
	(1.59)	(1.44)	(1.74)			
Number axis II disorders	1.57	2.02	1.50	-	K-W: $\chi^2 = 4.99$	.09
	(.65)	(1.12)	(.59)			

Note: [1]Kruskall-Wallis

Materials

Screening

Axis I and II diagnoses were made using the DSM-IV criteria with the Structured Clinical Interview for DSM-IV Axis I disorders (SCID I, First, Spitzer, Gibbon, & Williams, 1997) and the Structured Clinical Interview for DSM-IV Axis II disorders (SCID II, First, Spitzer, Gibbon, Williams, & Benjamin, 1994). Diagnoses were made by the first author or graduate students who underwent an intensive training program. Of the current sample, 97 SCID interviews were rated twice, yielding high inter-rater reliabilities values for SCID I and SCID II (Kappa values between .98 and 1.00 and between .76 and .93, respectively). PP was assessed using the Psychopathy Checklist-revised (PCL-r, Hare, 2003) supplemented by collateral data from the patient file information. Ratings were made by the first author or staff of the forensic clinics. Previous studies revealed a two-factor, four-facet hierarchical model of the PCL-r (Bolt, Hare, Vitale, & Newman, 2004; Hare, 2003). The four facets are: interpersonal (facet 1), affective (facet 2), lifestyle (facet 3) and antisocial (facet 4). These four facets load onto two higher order factors: interpersonal (factor 1), and lifestyle/antisocial (factor 2). The total level of PP, the PCL-r factors and facets were expressed continuously.

Anger induction

A stress-induction interview (Dimsdale, Stern, & Dillon, 1988) was used to induce anger. Each participant indicated a person who they disliked or had conflicts with as their aggressor. Participants recalled and verbally described a conflict in the past with that aggressor that generated strong emotions of anger. The instruction to the interview was: ``We are going to do a brief interview for 10 minutes about certain emotions you experienced in the past. I would like you to tell me about a situation in the past with your aggressor that made you very angry. Could you try to remember such a situation and tell me about it in detail? How did this made you feel? What did you want to do?``. Out of four anger induction methods, this stress interview proved to generate the highest levels of self-reported anger and anger-related physiology (Lobbestael, Arntz, & Wiers, 2008).

Dependent variables

Self-reported emotions were assessed by means of the Profile of Mood States (POMS), short version (McNair, Lorr, & Droppleman, 1992) with five subscales of tension, depression, anger, vigour, and fatigue. In order to investigate the influence of emotion induction on cognitive representation, anger related schema modes was assessed. Schema modes originate from Schema Therapy (Young, Klosko, & Weishaar, 2003) and reflect clusters of feelings, thoughts and behaviors, prominent at a given moment in time, that are especially prominent in patients with severe personality disorders. Schema modes were measured with an abbreviated version of the Schema Mode Inventory (SMI, Young, Arntz, Atkinson, Lobbestael, Weishaar, van Vreeswijk, Klokman, www.schematherapy.com) consisting of 3 items for each anger-related mode (the Angry Child, the Enraged Child and the Bully and Attack mode). Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured four times at each assessment using Omron M5-I via a standard cuff placed on the subjects` right arm above the elbow. To record heart rate, Blue sensor electrodes were attached over the lower rib on the left side of the trunk and to the subjects` chest to record a lead II electrocardiogram. Heart rate was expressed as the number of beats per minute. To monitor palm sweat gland activity, Ag/AgCl electrodes (8 mm diameter) filled with isotonic paste were attached to the volar surface of the medial segment of the middle and ring fingers of the non-dominant hand. A Galvanic Skin Response coupler supplied a constant 0.5 Voltage to assess skin conductance level (SCL) and response (SCR). SCR was defined as every response larger than .02 µS and smaller than 30 µS. The number of SCRs was counted during each assessment. Facial EMG was recorded bipolarly over the corrugator supercilli (frowning). The electrodes were placed on the left side of the face with 4-mm standard Ag/AgCl electrodes. Heart rate, SCL, SCR and EMG were recorded using the Vitaport III system, a portable continuously measuring physiological device, and analyzed off-line by means of a specially designed computer program. Two implicit association tasks were developed. In these adapted versions of the Single Category Implicit Association Task (SC-IAT), participants were presented with words belonging to a target category or one of the two attribute categories, which they had to classify by pressing the left or right response key (Karpinski & Steinman, 2006). The self-SC-IAT measured the association between `self` and `anger` and the aggressor-SC-IAT between `aggressor` and `swearwords`. The self-SC-IAT consisted

of an individualized self-related target category and two attribute categories: `anger` and `peaceful`. The aggressor-SC-IAT consisted of a target category of individualized aggressor-related items (the same aggressor as in the anger induction interview) and two attribute categories: `swearwords` and `words of appreciation`. The time between the appearance of the word on the computer screen and the first key press was measured. The SC-IATs consisted of three practice blocks and two test blocks. In first test block, `self` and `anger` words (respectively `aggressor` and `swearwords`) had to be attributed to the same response button and `peaceful` (`words of appreciation`) to the other button. In the second test block `self` and `peaceful` (respectively `aggressor` and `words of appreciation`) were assigned to the same response button and `anger` (`swearwords`) to the other button. Presentation order of the self- and aggressor SC-IATs and of attribute categories were randomized. By comparing average reaction time of compatible block with incompatible, the extent to which targets are associated with one versus the other attribute can be measured (Karpinski & Steinman, 2006).

Procedure

After signed consent was obtained, SCID-I, SCID-II and (for the ASPD group) the PCL-r were administered. Next, electrodes and blood pressure cuff were attached. The experiment was divided into three different phases (`blocks`): (i) the neutral block, in which participants had to watch a nature documentary (used as baseline), (ii) the anger induction block (interview) and (iii) the positive induction block, in which participants viewed a Mr. Bean movie fragment. Each block had a 10 minutes duration. After the neutral and anger blocks, participants filled in the POMS and the short SMI, while their blood pressure was recorded, and then completed the SC-IATs. Other physiological indices were assessed during the blocks. Finally, the experimenter removed the electrodes and subjects were given a small financial compensation and informed as to the nature of the study.

Statistical analyses

The self-SC-IAT effect was defined as the difference in reaction time between self-words when associated with anger compared to peacefulness. A positive self-SC-IAT score reflects a stronger self-anger than self-peaceful association, a negative self-SC-IAT score reflects a stronger self-peaceful than self-anger association. The dependent variables of the SC-IAT analyses were change scores of SC-IAT effects from baseline to anger block. Positive self-SC-IAT change scores reflect increases in self-anger association from baseline to anger block, and negative SC-IAT change scores reflect decreases in self-anger association. Similarly, positive aggressor-SC-IAT effects reveal stronger aggressor-swearwords than aggressor-appreciation associations, and positive aggressor-SC-IAT change scores reflect increases in aggressor-swearwords association from baseline to anger block.

For all dependent variables, baseline levels between groups were compared by means of ANOVAs. Deviation contrasts tested which of the groups differed from the overall mean. Because some of the group x gender cells were too small, a full-factorial gender by group analyses could not be performed. Instead, gender was included as an extra factor and only the main effect of gender was evaluated. To test whether

dependent variables changed from baseline to anger induction, Cohen's d effect sizes were calculated based on paired sample t-tests for each group, and for the whole sample. Paired sample t-tests were calculated to test whether self-reported anger changes differed from changes in other emotions. Changes from neutral to anger block were analyzed by ANOVAs with change scores as dependent variables and group and gender as factors. If there was no main effect of gender, this variable was left out of further analyses. Deviation contrasts were calculated to test whether the groups differed significantly from the overall mean. The influence of PP-level in the ASPD group was tested by Pearson Correlations between the change scores and the total PCL-r score, factor 1 and 2, and facet 1 to 4.

RESULTS

Self-reported emotions

At baseline, there was no main effect of gender on the self-reported emotions, p`s>.42. BPD and CI-C groups scored higher and the NpC group lower than average on all baseline negative emotions. The opposite pattern was found for the vigour subscale. The antisocials scored lower on depression and fatigue at baseline (table 2).

Gender did not influence the baseline-anger block change. Self-reported anger, depression and tension increased significantly after the anger induction. Paired sample t-tests revealed that the increase in anger was stronger than the increase in depression, t (146)= 6.84, p <.001, and in tension, t (146)= 9.14, p<.001. The overall effect size was medium for self-reported anger, small for depression and tension, and virtually zero for vigour and fatigue (table 3). The anger increase was significantly lower in the NpC group than the overall increase (table 4).

Table 2: Mean and standard deviations of baseline levels of dependent variables for all groups.

Dependent variables	ASPD contrast[e]			BPD contrast[e]			CI-C contrast[e]			NpC contrast[e]		
	Mean (sd)	t	p	Mean (sd)	t	p	Mean (sd)	t	p	Mean (sd)	t	p
Anger	2.19 (4.15)	-1.57	.12	5.56 (5.55)	2.91*	.004	5.48 (6.09)	2.81*	.006	1.09 (2.29)	-3.39*	.001
Depression	3.57 (5.94)	-2.06*	.04	9.89 (7.16)	4.48**	<.001	9.17 (7.80)	3.70**	<.001	1.09 (2.90)	-5.07**	<.001
Tension	3.71 (5.42)	-1.55	.12	6.80 (5.15)	2.60*	.01	7.96 (5.70)	4.36**	<.001	1.77 (2.51)	-4.55**	<.001
Vigour	9.57 (4.21)	-.19	.85	8.62 (3.74)	-2.04	.53	8.04 (4.12)	-3.15*	.002	12.57 (3.49)	5.00**	<.001
Fatigue	4.00 (5.62)	-1.99*	.05	8.91 (6.29)	3.96**	<.001	8.41 (6.24)	3.32*	.001	2.43 (2.44)	-4.32**	<.001
Angry Child	29.16 (27.31)	-1.89	.06	51.08 (22.54)	4.31**	<.001	55.77 (27.33)	5.58**	<.001	13.13 (17.08)	-6.83**	<.001
Enraged Child	20.54 (23.56)	-.38	.70	36.54 (23.50)	5.21**	<.001	25.71 (22.64)	1.36	.18	4.94 (7.49)	-5.60**	<.001
Bully and Attack	19.97 (16.87)	-.31	.76	24.61 (19.89)	2.27	.02	17.93 (18.88)	-.43	.67	13.38 (14.69)	-2.10*	.04
Heart rate	74.18 (8.56)	-.96	.34	80.68 (13.91)	2.39*	.02	77.34 (11.05)	.72	.48	72.50 (9.69)	-2.11*	.04
SBP[a,f]	120.77 (10.96)	-.28	.78	116.35 (5.05)	-2.52*	.01	121.98 (4.88)	.22	.82	127.03 (6.04)	2.55*	.01
DBP[b,f]	75.84 (6.90)	-1.31	.19	77.02 (3.18)	-1.04	.30	81.05 (3.07)	1.46	.15	80.92 (3.80)	1.30	.20
SCL[c]	3.54 (2.91)	-.51	.61	3.87 (2.36)	.16	.87	3.06 (1.86)	-1.86	.07	4.70 (3.40)	2.10*	.04
SCR[d]	5.71 (4.35)	2.09*	.04	3.66 (2.89)	-.98	.36	3.76 (3.82)	-.98	.36	3.88 (2.89)	-.63	.52
Frowning	15.87 (17.64)	-3.41*	.001	524.57 (487.72)	6.35**	<.001	90.74 (217.87)	-2.54*	.01	158.72 (268.74)	-.80	.41
Self- SC-IAT	-131.44 (156.71)	-1.60	.11	-58.46 (140.26)	1.57	.12	-68.03 (157.43)	1.09	.28	-101.41 (132.42)	-.53	.84
Aggressor- SC-IAT	59.06 (195.09)	-.53	.60	75.85 (264.61)	.24	.81	110.97 (220.30)	1.24	.22	41.18 (183.69)	-.80	.43

Note: [a] systolic blood pressure, [b] diastolic blood pressure; [c] skin conductance level; [d] number of skin conductance responses during the blocks; [e] deviation contrast; [f] corrected for gender; * significant at p<.05; ** significant at p<.001

Table 3: Mean (M), standard deviations (SDs) and effect sizes of all changes in dependent variables for all groups

Dependent variable	ASPD change score			BPD change score (SD)			CI-C change score (SD)			NpC change score (SD)			Overall change score (SD)		
	M[e]	SD	ES[f]	M[e]	SD	ES[f]	M[e]	SD	ES[f]	M[e]	SD	ES[f]	M[e]	SD	ES[F]
Anger	4.71	6.01	78*	5.09	5.25	.97**	5.04	5.26	.89**	1.92	4.47	.41*	4.27	5.31	.77**
Depression	2.92	6.11	.46*	1.36	5.14	.26	2.51	5.58	.45*	.40	2.21	.18	1.71	4.97	.34**
Tension	1.22	4.29	.28	1.27	5.01	.25	.68	3.55	.20	.26	2.58	.10	.84	3.96	.21*
Vigour	.86	3.51	.24	-.56	2.63	-.21	.02	2.43	.009	.14	2.48	.06	-.01	2.69	-.003
Fatigue	.96	3.14	.30	.00	3.54	.00	.39	4.20	.09	-.63	1.66	-.38*	.11	3.39	.04
Angry Child	6.03	19.33	.31	10.87	17.52	.61**	5.44	16.17	.29*	3.05	10.01	.26	6.62	16.02	.38**
Enraged Child	5.89	16.71	.35	7.79	23.38	.33*	7.89	16.38	.47*	1.87	7.74	.23	6.14	17.49	.34**
Bully and Attack	3.90	12.47	.31	2.77	13.50	.15	4.72	9.45	.47*	-.69	6.96	-.11	2.72	10.92	.21*
Heart rate	-1.13	6.06	-.19	-.42	5.01	-.08	2.72	4.88	.54*	3.42	5.18	.61*	1.61	5.46	.28**
SBP[a]	-.21	6.84	-.03	2.19	5.29	.41*	4.68	6.12	.77**	2.58	4.79	.54*	2.71	5.83	.46**
DBP[b]	1.81	6.95	.26	3.65	5.12	.71**	4.23	4.39	.96**	2.84	4.44	.64*	3.37	5.06	.67**
SCL[c]	.66	.86	.79*	.52	1.00	.53*	.62	.99	.62**	.73	1.30	.55*	.63	1.05	.60**
SCR[d]	1.95	2.66	.73*	2.25	2.36	.95**	2.61	2.35	1.14**	2.71	1.91	1.43**	2.45	2.29	1.09**
Frowning	41.75	106.67	.39	-.29	66.69	-.004	25.40	118.39	.21	44.99	129.19	.35	28.49	111.17	.26*
Self SC-IAT	151.73	193.89	.80*	69.18	160.21	.43*	55.91	183.07	.34*	22.85	156.11	.13	66.45	174.54	.38**
Aggressor SC-IAT[g]	59.06	387.52	.11	-12.31	268.82	-.04	-104.02	212.76	-.39*	-4.21	167.26	-.02	-15.37	256.46	-.06

Note: [a] systolic blood pressure, [b] diastolic blood pressure; [c] skin conductance level; [d] number of skin conductance responses during the blocks; [e] positive scores indicate increases in dependent variables, and negative scores indicate decreases in dependent variables; [f] effect sizes (Cohen`s d of change score); [g] corrected for gender; * significant at $p < .05$; ** significant at $p<.001$.

Table 4: Main effects of gender and deviation contrasts between the groups on changes in dependent variables.

Dependent variables	Gender		ASPD vs overall		BPD vs overall		CI-C vs overall		NpC vs overall	
	F	p	t	p	t	p	t	p	t	p
Anger	.03	.87	.57	.57	1.27	.21	1.21	.70	-2.97*	.004
Depression	.15	.70	1.29	.20	-.66	.51	1.07	.29	-1.92	.06
Tension	.001	.98	.52	.60	.76	.45	-.33	.74	-1.02	.31
Vigour	.26	.61	1.56	.12	-1.84	.07	-.26	.79	.07	.95
Fatigue	.04	.84	1.30	.20	-.39	.70	.46	.65	-1.62	.11
Angry Child	.34	.56	-.11	.91	2.08*	.04	-.42	.68	-1.40	.16
Enraged Child	.16	.69	.01	.99	.81	.42	.86	.39	-1.55	.12
Bully and Attack	.07	.79	.64	.52	.07	.95	1.39	.17	-2.10*	.04
Heart rate	.07	.79	-2.32*	.02	-1.77	.08	2.05*	.04	2.77*	.007
SBP[a]	3.33	.07	-2.45*	.02	-.16	.88	3.02*	.003	.32	.75
DBP[b]	1.04	.31	-1.44	.15	.74	.46	1.57	.12	-.39	.70
SCL[c]	.64	.42	.14	.20	-.59	.56	-.09	.93	.57	.57
SCR[d]	.43	.51	-.97	.34	-.32	.75	.66	.51	.87	.39
Frowning	3.09	.09	.67	.51	-1.41	.16	-.16	.88	.94	.35
Self SC-IAT	.21	.65	2.52*	.01	-.24	.81	-.81	.42	-2.01*	.05
Aggressor SC-IAT[e]	4.73*	.03	1.60	.11	.09	.93	-2.55*	.01	.29	.77

Note: [a] systolic blood pressure; [b] diastolic blood pressure; [c] skin conductance level; [d] skin conductance response; [e] corrected for gender; * significant at $p < .05$

Schema modes

At baseline, there was no main effect of gender, *p*`s>.14. Compared to the overall mean, BPD-patients scored higher on Angry and Enraged Child modes, CI-C-patients higher on Angry Child mode, and NpCs lower on all modes at baseline (table 2).

There was no gender effect on the change scores. The three anger-related modes increased significantly from baseline to anger block. The overall effect sizes were in the medium range for all three modes (table 3). De BPD group displayed a stronger increase in the Angry Child mode compared to the overall mean, while the NpC group displayed a smaller increase in Bully and Attack mode compared to the other groups (table 4).

Physiological measures

At baseline, there was a main effect of gender on SBP, $F(1, 139) = 20.57$, $p<.001$ and DBP, $F(1, 139) = 5.74$, $p=.02$, which were both higher in men. BPD-patients had lower and NpCs higher baseline heart rate and SBP. NpCs had a higher baseline level of SCL, and ASPD patients had a higher SCR level than the overall mean. BPD-patients displayed more and ASPD and CI-C-patients less frowning compared to the overall mean (table 2).

Gender had no effect on changes in physiological indices. Overall effect sizes indicated that all physiological indices increased significantly from baseline to anger phase. Overall effect sizes of physiological indices varied from small (heart rate, SBP and frowning), to medium (DBP and SCL) to large (SCR, table 3). ASPD-patients showed a decrease in heart rate whereas the overall effect was an increase. The CI-C and NpC groups had significantly larger increases in heart rate compared to the overall mean. ASPD-patients also displayed a decrease in SBP that differed significantly from the overall mean, while this increase was significantly stronger in CI-C-patients than in the rest (table 4).

SC-IATs

At baseline, there was no main effect of gender on the SC-IATs, *p*'s >.22. None of the groups deviated from the overall mean in baseline SC-IAT (table 2). Effect sizes indicated that there was a significant overall change of the self-SC-IAT from baseline to anger phase, while this was not the case for the aggressor-SC-IAT. The self-SC-IAT had a small effect size, while the effect size of the aggressor-SC-IAT was close to zero (table 3). There was a main gender effect on the change score of the aggressor-SC-IAT, in that men displayed a stronger shift after the anger induction towards an aggressor-swearword association than women. ASPD-patients displayed stronger changes towards self-anger associations than the overall mean, while the opposite pattern was found for the NpC group. The CI-C group displayed a weaker shift towards an aggressor-swearword association compared to the overall mean (table 4).

Influence of psychopathy

The total PP score, factor 1 and 2, facet 1, 3 and 4 did not correlate with the change scores of the dependent variables (table 5). The affective facet (facet 2) of PP had negative correlations with increases in all negative affects and DBP. Scatterplots of the PCL-r affective scores and these variables indicated that antisocials scoring high on affective PP facet 2 had a lower increase in DBP compared to the overall mean, and those antisocials that scored low on the affective PP factor showed stronger increases in negative emotions (see figure 1).

Table 5: Pearson correlations between all change scores of the dependent variables and PCL-r total, PCL-r factor and PCL-r facet subscales.

Change scores dependent variables	PCL-r total	PCL-r Factor 1	PCL-r Factor 2	PCL-r Facet 1	PCL-r Facet 2	PCL-r Facet 3	PCL-r Facet 4
Anger	-.11	-.24	-.12	.23	-.50*	.03	-.01
Depression	-.28	-.39	-.15	.16	-.63*	.05	.09
Tension	-.42	-.45	-.33	-.11	-.52*	-.40	.09
Vigour	-.12	-.05	.12	-.002	.03	.06	.19
Fatigue	-.38	-.34	-.29	.31	-.66*	-.20	-.10
Angry Child	.42	.12	.24	-.11	.32	.26	.13
Enraged Child	.34	.24	-.14	.36	-.02	-.02	-.07
Bully and Attack	-.34	-.27	-.30	-.11	-.31	.38	-.51
Heart rate	-.09	-.13	-.14	-.10	-.09	-.30	-.10
SBP[a]	-.20	-.19	-.10	-.01	-.27	.06	-.05
DBP[b]	.01	-.29	.21	.20	-.60*	.16	.32
SCL[c]	.36	.29	.21	.38	.04	.12	.11
SCR[d]	.23	.32	-.04	.18	.27	-.02	-.24
Frowning	-.02	.03	-.36	.22	-.18	-.19	-.27
Self SC-IAT	-.05	.17	-.06	-.08	.37	-.06	-.09
Aggressor SC-IAT	-.37	-.36	-.34	-.09	-.44	.11	-.28

Note: [a] systolic blood pressure; [b] diastolic blood pressure; [c] skin conductance level; [d] skin conductance response; * significant at $p < .05$

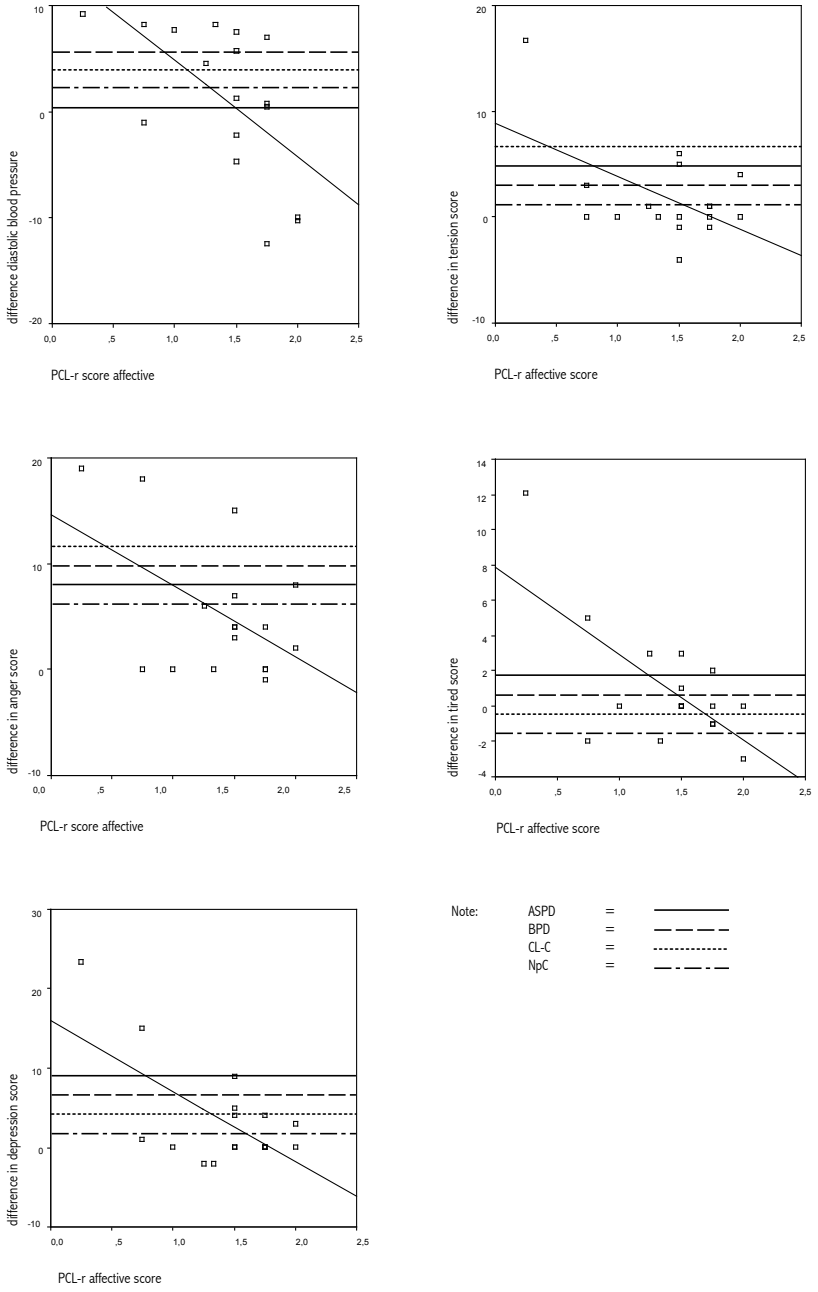

Fig. 1 Scatterplots of PCL-r affective score and diastolic blood pressure and the negative emotions

DISCUSSION

The current study investigated the influence of anger on self-reported emotions, schema modes, physiological reactivity and implicit cognitive associations in ASPD, BPD, CI-C and NpCs. Self-reported increases in anger and in anger-related schema modes of antisocials were comparable to those of other groups. Regarding physiology, the ASPD group showed non-significant decreases in heart rate and SBP that markedly differed from the overall pattern of increases in the other groups. With respect to the reaction time tasks, the antisocials showed a significantly stronger shift towards self-anger association after anger induction compared to the other groups. In other words, the ASPD-patients demonstrated a cardiovascular hyporeactivity and an implicit cognitive hyperreactivity. This finding has three important aspects: first, antisocials do not show abnormal anger reactivity on a direct level. Second, regarding indirect measures, the anger reactivity of antisocials does differ markedly from the other groups. Third, within the indirect anger assessment level antisocials show a discrepancy between physiology (i.e. heart rate and SBP) and implicit cognition. The total level of PP had no influence on the explicit or implicit anger indices of antisocials, nor did factor 1 or 2. Antisocial patients that scored high on the affective facet of PP however indicated a smaller increase in negative emotions and showed a SBP decrease. This indicates that the overall level of PP does not play a major role in anger reactivity of antisocials, but the affective component of PP does.

Our findings of cardiovascular under-arousal in antisocial individuals supports the notion that physiological under-reactivity holds for a broader population than psychopaths only (Steuerwald & Kosson, 2000). The negative association between the affective PP factor and SBP, suggests that the cardiovascular under-reactivity is even more pronounced in the subgroup of antisocials that lack emotionality. Since this study only found antisocials to differ from the other groups in heart rate and in SBP and not in electrodermal or frowning reactions, the finding of physiological under-arousal in antisocials only received support for the physiological systems involved with activation, not for the arousal and valence systems.

One possible explanation for the anger-related implicit cognitive over-reactivity of antisocials can be found in studies of kindling and behavioral sensitization that revealed that the likelihood of cognitive patterns being activated depends on the frequency of past usage (Segal, Williams, Teasdale, & Gemar, 1996). The strong change towards anger-related cognitions after the anger induction in antisocials could be the result of their aggressive nodes being easily triggered because of frequent use in the past.

The cardiovascular changes of antisocials in reaction to anger did not parallel the cognitive anger-related changes. One possible explanation for this discrepancy can be found in animal defense models that propose the defense phase (i.e. fight response) associated with increases in physiological responses is preceded by an orienting phase in which heart rate decreases and in which the organism is vigilant and prepares to respond, here reflected in cognitive anger-related hyper-association (Graham & Clifton, 1966; Lacey & Lacey, 1958; Lang, David, & Öhman, 2000; Sokolov, 1963). The anger induction interview used in the current study was not set up to provoke a counter-attack of the participant since the object of aggression was far away. Nonetheless, physiological indices suggest that the interview did trigger a response that was associated with a defense reaction in most of the participants (i.e. increased heart rate

and SBP), while in antisocials it seemed to result in a controlled preparation for a possible later attack (i.e. decreased heart rate and SBP, and cognitive vigilance association with aggression). This suggests that ASPD patients differ in their timing of their defensive response. Because organisms are assumed to switch to defense when the intensity of the emotional stimulus increases, it could be that antisocials would have switched to the defense phase if the anger stimulus was more imminent (e.g. harassment procedure, Lobbestael et al., 2008). Such an explanation implicates that the strength and imminence of the anger stimulus determines whether an antisocial individual displays orienting or fight responses, which is in line with the `predatory imminence continuum` as a key component of defensive switching (Fanselow & Lester, 1988). Relating this to the predatory and impulsive aggression dimensions (Dodge, 1991; Meloy, 1988) and given that autonomic arousal has shown to be minimal in predatory aggression (Stanford, Houston, Villemarette-Pittman, & Greve, 2003), the current data suggest that whether antisocials display predatory-like or impulsive aggression could depend on the intensity and/or imminence of the anger stimulus. Since predatory-like aggression requires forethought (Blair, 2003) and thus increased cognitive processing (Chase, O`Leary, & Heyman, 2001), the finding of increased implicit cognitive anger further underlines the assumption that the anger interview mostly caused ASPD-patients to display controlled predatory-like aggression expressed in a prolonged orienting phase. This view supports the idea that predatory versus impulsive aggression does not constitute a trait-like dichotomy but rather that both kinds of aggression can be present in an offender depending on the situation (Cima & Raine, personal communications).

Because lying is a central characteristic of ASPD (APA, 2005), it was expected that antisocials would have reported a smaller increase in anger. The fact that only antisocials high on the PP affective facet reported a lower increase of negative emotions could be due to several reasons. First, it could be that antisocials in general adequately acknowledge their level of anger. Antisocials might underreport negative feelings like depression or fear, but not anger. Since the experiment took place in a neutral test situation and their anger rating had no consequences for any juridical decisions regarding their prison status, it is unlikely that they had advantage of faking good (Cima, Merkelbach, Hollnack, Butt, Kremer et al., 2003). Second, because there is no gold standard for measuring the `true` presence of anger, it could be that the antisocial group actually experienced more anger than they reported. This suggests that the questionnaire data reflect `text-appropriate` ratings rather than emotional experiences per se (Herpertz, Werth, Lukas, Qunaibi, Schuerkens et al., 2001). Third, the finding that low affective antisocials indicated low levels of affect changes indicates that both the PCL-r raters and the patients themselves agree on the patient's lack of emotionality, at least on the overt level. Consequently, it is likely that this subgroup truly experienced a lower level of anger. This assumption was further supported by the finding that antisocials with a lack of affect displayed a lower change in DBP. Note however that implicit self-anger associations were not related to this PP facet, thus these patients were on an implicit associative level as angry as ASPD-patients low in facet 2.

In line with our expectations, anger related schema modes increased significantly after the anger induction (Young et al., 2003). This corroborates the assumption that people switch to anger-related modes when that emotion is triggered. The finding that BPD-patients indicated a stronger presence of the Angry Child mode after the anger induction correspondents to the hypothesis that the Angry Child mode is especially prominent in BPD-patients (Young et al., 2003).

The borderline group of this study did not differ from the other groups in the self-reported changes of emotions. While this is in line with some previous studies (Jacob, Guenzler, Zimmerman, Scheel, Ruesch et al., in press; Koenigsberg, Harvey, Mitropoulou, Schmeidler, New et al., 2002), it does not support Linehan's notion of emotional hyperresponsivity and several other studies that corroborated this hypothesis (Herpertz, Gretzer, Muhlbauer, Steinmeyer, & Stass, 1998; Levine, Marziali, & Hood, 1997). The BPD group did not significantly differ from the other groups regarding physiological indices. Nonetheless, the BPD group's mean heart rate and blood pressure responses were in between the ASPD and CI-C and NpC groups, in line with a previous finding of blunted physiological response in BPD. This indicates that the anger-related physiological response pattern of the BPD group is in between the ASPD and the CI-C and NpC groups.

The current study has several implications for clinical forensic practice. First, antisocial patient's verbal expression of anger might not correspondent to their implicit cognitions and bodily activation. Further studies should test which system best predicts aggressive behavior. Furthermore, the expression of predatory versus impulsive aggression (Dodge, 1995; Meloy, 1988) might depend on the imminence of the anger stimulus. This would implicate that offenders are not predatory-like *or* impulsive, but can display both types of aggression depending on the situation.

Several drawbacks should be acknowledged. First, not enough female antisocial and male borderline participants were included in the current study to assess group by gender interactions. Unfortunately, women that are antisocial but not borderline and borderline men that are not antisocial are quite rare in practice and therefore very difficult to recruit. Second, since this study did not include a baseline activation task (e.g. an interview on a neutral topic) it cannot be differentiated which part of the reactivity following the anger interview originated from activation versus emotional processing. Third, physiological reactivity was assessed during the anger induction phase, while self-ratings of emotions and the SC-IATs were performed immediately after the anger induction. This was done because the current study focussed on emotional reactivity during anger experience, and not on the duration or post-hoc effects of anger. Nonetheless, it should be kept in mind that a time-effect might have confounded the comparison between physiology and the other anger-related variables.

In sum, this was probably the first study to assess the impact of sustained anger (increasing the ecological validity) in well-defined samples of antisocial and psychopathic individuals. Overall, antisocial patients did not differ from the other groups in self-reported anger, but antisocials lacking affect indicated a lower increase in negative emotions. Furthermore, antisocials displayed a cardiovascular under-reactivity that was even more pronounced in those lacking emotional affect, and an implicit cognitive over-reactivity

in reaction to the anger induction procedure. This finding suggests a strong controlled predatory-type of anger response in ASPD. This study illustrates the importance of the use of alternative assessment methods of emotional reactivity in antisocial populations in order to further understand this personality disorder.

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Chapter 12

General discussion

In this final chapter, results are discussed for each of the three central themes of this thesis: schema modes, childhood trauma and anger. Additionally, emotional reactivity and psychopathy (PP) are discussed. Extra emphasis is put on the comparison between borderline personality disorder (BPD) and antisocial personality disorder (ASPD). Finally, clinical implications, limitations of the present findings and suggestions for further research are described.

DISCUSSION

Schema modes

Modes assessment in personality disorder groups.

In contrast to the other studies of this dissertation (*chapters 3, 5, 6, 9* and *11*), the mode assessment of BPD and ASPD patients in *chapter 4* was based on a mode assessment instrument developed prior to the Schema Mode Inventory (SMI); the Schema Mode Questionnaire (Klokman, Arntz, & Sieswerda, 2001) that measures the presence of 6 modes. This chapter demonstrated that BPD patients reported a stronger presence of the Abandoned/Abused Child, Angry Child, Detached Protector and Punitive Parent modes as compared to both ASPD-patients and non-patient controls (NpCs). The fact that these four modes appeared to be BPD specific, confirmed Young`s hypothesis and the results of Arntz, Klokman, and Sieswerda (2005) who compared mode presence of BPD with that of Cluster C (ClC) patients and NpCs. When the relationships between all personality disorders (PDs) and 14 modes were tested in *chapter 5*, again the four modes of Abandoned/Abused Child[1], Angry Child, Detached Protector and Punitive Parent were found to correlate to BPD, thus even when controlled for the severity of all other PDs. Additionally, and also in line with Young`s hypothesis, there was a strong association with the Impulsive Child mode (not measured in *chapter 4*), which resulted in BPD to be associated with the five *a priori* expected schema modes. However, next to these five modes, four additional maladaptive modes appeared to be related to BPD in *chapter 5*, causing BPD to be associated with a total of 9 maladaptive modes. While, at first sight, this raises doubt regarding the specificity of the mode conceptualization of BPD, inspection of the data showed that the strongest of these significant correlations were found between BPD and the five hypothesised modes, which supports the BPD mode model. Based on the findings of *chapter 5*, we suggest to add the Enraged Child mode to the BPD mode model, since the correlation of this mode and BPD was comparable to that of the hypothesized modes and it makes good theoretical sense since BPD-patients often experience uncontrollable anger.

Findings on the mode conceptualization of ASPD were not as conclusive as those of BPD across the two mode assessment studies. First, while *chapter 4* revealed a strong correlation between ASPD and the Healthy Adult mode, this relationship did not emerge when controlled for the severity of all other PDs (*chapter 5*). At least two explanations can account for this difference; first, the conclusion of `supernormal`

1 In the Schema Mode Questionnaire of Chapter 4 the Abandoned/Abused Child mode was operationalized as a separate mode. Chapter 5 was based on the validated version of the Schema Mode Inventory in which the Abandoned/Abused Child mode was merged with the Lonely Child mode into the Vulnerable Child mode (see Chapter 3).

mode presentation of ASPD patients in *chapter 4* mainly stemmed from the fact that ASPD patients` scores of the Healthy Adult mode was almost as high as those of the NpCs, while in *chapter 5*, ASPD patients could not be directly compared to NpCs because of a different statistical approach. Second, *chapter 5* not only included a BPD patient comparison group, but instead, the ASPD-Healthy Adult mode association was controlled for the severity of *all* other PDs. So, compared to BPD patients alone, the Healthy Adult mode appeared stronger in ASPD patients, but not when compared to all other PDs. *Chapter 4* showed that ASPD-patients had a stronger level of Bully and Attack mode that significantly differed from the NpC group, but not from the BPD group. Furthermore, it remained inconclusive from this chapter in which degree the modes of the Abandoned/Abused Child, Angry Child, Detached Protector and Punitive Parent were also characteristic of ASPD since, besides BPD, there was only a healthy control group. *Chapter 5* produced more clear results on this issue: controlled for the severity of other PDs and in a much larger sample, the Enraged Child and the Bully and Attack modes proved to be the only two maladaptive modes that were strongly indicated by the ASPD patients. In sum, self-report data showed that antisocial patients are characterized by an Enraged Child and a Bully and Attack mode, and a higher Healthy Adult report than most other PDs.

Although Schema-Focussed theory hypothesised a similar mode pattern for BPD and ASPD, we only found evidence for a shared presence of the Enraged Child mode. Additionally, BPD patients were characterized by a broad range of maladaptive modes while ASPD patients only indicated the presence of maladaptive modes reflective of a disturbed anger regulation. Thus, with respect to self-report, quite different mode patterns emerged for BPD and ASPD.

Patient- versus therapist report of modes.

Since the value of self-report might be questionable in patients with ASPD, *chapter 6* compared the mode presence in ASPD as assessed by the ASPD patients themselves with assessment by their therapists. First of all, these data showed that since discrepancy in mode rating between patients and therapists was much stronger for ASPD than for BPD and CIC PDs, there is indeed reason to doubt the value of self-reported modes of ASPD patients. As a consequence, it might be more reliable to compare the therapists rating of the mode presence of ASPD patients with other PD patients. In doing so, the mode pattern of BPD and ASPD patients appeared much more alike than when assessed by means of self-report; according to their therapists, BPD and ASPD patients only differed on the presence of the Demanding Parent mode that the therapists rated stronger for BPD than for ASPD, the same mode that correlated negatively with ASPD based on self-report *(chapter 5)*. Thus, self-report only revealed a strong presence of the Enraged Child and the Bully and Attack modes in ASPD patients, while the therapists of the ASPD patients indicate a stronger presence of 9 other maladaptive modes in these patients too. This suggests that the antisocial patients see themselves as mostly healthy with only a deviant anger-responsivity, while their therapists recognize additional mode-related pathology (i.e. on other aspects than anger) in these patients, causing them to be much more similar to BPD patients in mode terms. If the therapists` mode ratings are indeed more accurate than the patients` ratings, this would imply that ASPD patients do not acknowledge the presence of BPD-like modes, which could be due to a lack of insight or to denial of that pathology, which

the typical ASPD patient might consider as `weak` and not matching their self-reliant, autonomous self-view. On the other hand, at about half of the therapists that participated in the study of *chapter 6* were Schema-Focussed therapists that might have been influenced by theoretical assumptions on PD-mode associations in filling out the mode questionnaire of their patient. This might have led to an overestimation of the maladaptive modes in ASPD-patients.

While the conclusion on the association between ASPD and the Healthy Adult mode appeared to depend on the comparison groups used in the previous chapters, *chapter 6* showed that the therapists of the ASPD patients rated the Healthy Adult mode in ASPD patients stronger than the therapists of BPD and ClC patients did. So, when viewing the therapists` ratings as the gold standard for mode presence, the ASPD patients would also be characterized by a Healthy Adult mode. Thus, there are indications that ASPD patients and their therapists agree on the strong presence of the Healthy Adult mode. At first sight, it seems strange that therapists would designate both a strong presence of the healthy side (i.e. the Healthy Adult mode) and of the pathological side (i.e. maladaptive modes) in ASPD patients, particularly since Schema-Focussed Therapy (SFT) assumes that a strong Healthy Adult mode rules over the maladaptive modes and diminishes their negative influence. On the other hand, it is not that surprising since the mode questionnaire used in the current studies does not assess dominance of one mode over the other modes but *general* frequency of mode presence. Therefore, it is possible that contradictory types of modes are tapped with this questionnaire because, although not simultaneously, ASPD patients can often display their healthy mode, but also their maladaptive modes. One possible explanation for the strongly developed healthy mode of ASPD patients might be that the Healthy Adult mode is the default mode of ASPD patients and maladaptive modes are not that frequently active. The unexpected aggressive outbursts displayed by antisocials might reflect a switch from this healthy default mode to aggressive modes. This would implicate that, despite the strong presence of the Healthy Adult mode in ASPD patients, it is not always strong enough to temper the aggressive behaviour these patients display. Schema-Focussed theory would add that the Vulnerable and Lonely Child modes usually remain latent, as the typical ASPD patient responds with angry modes and not with these `weaker` modes when challenged. Careful interviewing suggests indeed that people with angry outbursts report to have experienced a short moment of emotional pain before turning into an angry counterattack (Beck, 1999).

Testing of the mode-switching hypothesis.

The mode-switching hypothesis was tested by evaluating the effect of mood inductions on mode presentation in *chapters 9* and *11*. The abuse-related stress induction (*chapter 9*) was expected to specifically increase the presence of the Lonely Child and Detached Protector modes, but also increased the Furious Child. Thus, the abuse-related stress induction led to a broad range of negative modes centred round themes like vulnerability, detachment and anger. These results only partly parallel those of Arntz et al. (2005) who found that virtually the same abuse-related movie fragment increased levels of Abandoned/Abused Child, Detached Protector but also of Punitive Parent modes, and none of the other modes, although it has to be noted that only 7 modes were measured in that study. The fact that

the abuse-related stress induction led to a more diffuse pattern of increases in maladaptive modes can possibly be attributed to the nature of the abuse stimulus that was used: the movie fragment was quite long (20 minutes) and several emotions like sadness, fear and anger were depicted which could have triggered a comparable variety of negative emotions in the participants watching this movie. Additionally, since no specific instructions were given, the experimenter had less influence over the patient's emotional state compared to the anger interview in which the participants were forced to focuses specifically on their past feelings of anger and were verbally guided by the experimenter, leaving less room for the elicitation of other emotions. *Chapter 11* showed that the anger induction did specifically induce anger related schema modes and none of the other modes.

BPD patients showed a switch towards the Vulnerable and Furious Child modes after the abuse-related induction and towards the Angry Child after the anger induction. ASPD patients on the other hand did not indicate significant changes in mode strength after both inductions. Inspection of the group differences in mode-switching indicated that the BPD-patients rated a stronger increase of the Angry Child mode following the anger-induction compared to the overall mean. The same held for the maladaptive modes in general after confrontation with the abuse-related stress. These data provide evidence for the hypothesis that mode-switching is more extreme or more easily induced in BPD-patients following confrontation with BPD-specific themes, while this does not appear to be the case for the ASPD group.

In sum, these two studies provide general evidence for the mode-switching hypothesis since there appeared clear alternations in mode presentation after mood inductions. Furthermore, mixed evidence was provided for the specificity of the modes that were triggered since these mode-changes were more confined for anger than for abuse-related stress. Possibly, this suggests that mood inductions causing more internalized negative affects lead to a rather diffuse mode switching, while the induction of externalizing emotions like anger lead to a more restrained mode-switching. However, procedural differences might also account for the difference, with the anger interview better controlling the intended emotion induction than the more diffuse abuse-related movie induction method.

Conclusions

Overall, the results on the mode presence in BPD and ASPD patients indicated that BPD patients are characterized by the Lonely, Angry, Impulsive and possibly Enraged Child modes, the Detached Protector and the Punitive Parent modes. The mode conceptualization of ASPD patients is more disputable since the patients themselves only indicated a strong presence of the Enraged Child and Bully and Attack modes, while the therapists of the ASPD patients suggested a mode pattern that is highly similar to that of BPD patients. ASPD patients and their therapists do seem to agree on the presence of a relatively strong Healthy Adult mode in ASPD patients.

These findings appeared to depend on the patient comparison groups and the sources of information (i.e. patient versus therapist reports) that were used, especially for the ASPD group. Although both patients and therapists are troubled by their own interpretation biases, it is likely that the therapists` ratings are

more reliable due to their professional status and the egosyntonic nature of PD pathology. Furthermore, mode-switching appeared to be more confined for the anger than for the abuse-related emotions and overall stronger for the BPD group.

Childhood trauma

When comparing childhood trauma between BPD and ASPD patients, *chapter 4* revealed that both groups did not differ from each other in the total severity of trauma. *Chapter 8* did provide evidence that these disorders were associated with different kinds of abuse; BPD was associated with sexual abuse, emotional abuse, and emotional neglect, while ASPD was uniquely linked to physical abuse.

Anger

Despite *chapter 10* indicated that, compared to the interview procedure, harassment had the advantage of producing more specific feelings of anger, interview was selected as anger induction method in *chapter 11*. There were two reasons for this. First, the study in *chapter 10* was performed on healthy participants and it could not be predicted how the forensic patients of *chapter 11* would respond to this method. Since the harassment procedure involved giving highly negative feedback to the participants and, because antisocial patients have a strong disregulated anger reactivity, the safety of the experimenter could have been at risk. The interview condition was much safer and increased the chance for acceptance of this method by the ethical committees that had to give their permission to conduct this experiment. Second, using the harassment procedure would have implied the experimenter to switch in his/her role from a neutral test-leader to the role of the aggressor. This would jeopardize the risk of the credibility of the harassment method and of the continuation of the patients` collaboration to the experiment. Therefore, a second experimenter would have needed to be involved in this study taking the role of the aggressor, but this would have been very hard to do because of pragmatic reasons in the forensic settings.

Emotional reactivity

Overall, for BPD-patients, the pattern of abuse-related stress reactivity *(Chapter 9)* seemed to be congruent over the different assessment methods; they showed a hyperresponsivity on self-reported negative affect and schema modes, phychophysiological responses and indirect self-abuse association. In contrast, for ASPD-patients, there are indications of a hyperresponsive indirect cognitive abuse-related reactivity, but others levels (i.e. self-report and physiology) are non-deviant. Thus, there are discrepancies between different abuse-related responses in ASPD-patients. A similar pattern was observed in *Chapter 11* where ASPD-patients did not display a deviant self-reported anger response but a physiological hyporesponsivity and cognitive anger-related hyperresponsivity. These findings suggest highly complex patterns and interactions of emotional reactivity in ASPD-patients.

The findings of this dissertation do not provide a straightforward answer regarding the emotional reactivity in BPD and ASPD patients. Moreover, the pattern of emotional reactivity seemed to depend on the emotion that was targeted and the assessment methods used. Abuse-related stimuli (*chapter 9*) appeared to cause hyper-emotionality in BPD patients on self-reported, psychophysiological and implicit

cognitive associative levels. Despite having experienced high levels of childhood trauma, ASPD patients did not appear to deviate from the non-patient group in self-report and physiological reactivity, but did display a hyper-responsive implicit cognitive association similar to that of the BPD group. The lack of increased physiological reactivity (with the exception of frowning) in ASPD patients after confrontation with abusive reminders might indicate that these reminders do not lead to a deep processing of affect in these patients. Alternatively, the low physiological reactivity might reflect triggering of moral disgust in ASPD patients. *Chapter 11* indicated that anger-related stimuli elicited a significant and comparable increase in self-reported anger in all groups but failed to elicit a normal psychophysiological defense response in ASPD patients. Instead, ASPD patients reacted with a decrease in heart rate and systolic blood pressure that markedly differed from the other groups. Nevertheless, ASPD patients displayed a cognitive hyper-responsivity, stronger than that of the other groups. Thus, the physiological hypo-responsivity in ASPD patients is in contrast with their cognitive anger-related hyper-responsivity. These conflicting response patterns can indicate that the defense reaction of ASPD patients is characterized by a prolonged orienting phase that allows them to better prepare for a possible later attack. BPD patients did not display a deviant indirect anger-related reactivity.

So, while childhood abusive events play a major role in both BPD and ASPD, ASPD patients react markedly less extreme to confrontation with abuse-related stimuli than BPD patients do on self-reported emotional and physiological levels, while cognitive abuse-related associations increased in both patient groups. Similarly, while disregulated anger reactivity is a central diagnostic feature of both BPD and ASPD, these two groups only appear to be comparable in the level of increase of self-reported anger. In contrast to ASPD, the BPD group did not appear to have a deviant indirect anger response pattern, not at a physiological, nor at a cognitive associative level.

According to Linehan (1993), BPD patients are emotional hyperresponsive. Our findings indicate that the emotional reactivity pattern of BPD patients depends on the emotion that is targeted; BPD patients are hyperresponsive in reaction to abuse-related stress, but not in reaction to anger. This might explain why several studies aiming at examining Linehan`s hypothesis produced conflicting results; most of these studies assessed overall emotional reactivity (Herpertz, Werht, Lukas, Qunaibi, Scheurkens et al., 2001; Herpertz, Gretzer, Steinmeyer, Muehlbauer, Schuerkens et al., 1997; Herpertz, Kunert, Schwenger, & Sass, 1999; Levine, Marziali, & Hood, 1997) and did not differentiate between emotions. Two studies specifically targeted anger. Jacob, Guenzler, Zimmerman, Scheel, Ruesch et al. (in press)`s results were in line with our findings in that BPD patients did not indicate an elevated increase in anger following an anger-inducing story. BPD-patients in the study of Koenigsberg, Harvey, Mitropoulou, Schmeidler, New et al. (2002) did indicate a higher lability of anger (i.e. the degree in which their mood shifts between baseline level and anger) than patients with other PDs, but anger was not experimentally induced in this study. Schmahl, Elzinga, Ebner, Simms, Sanislow et al. (2004) found that BPD patients reacted with physiological

hyperactivity to abandonment scripts, mimicking our findings. Thus overall, most findings seem to point to different physiological response patterns for specific emotions in BPD. More specifically, BPD patients react hyperresponsive to abuse and abandonment stimuli, but not to anger.

The findings of these two experiments indicate that ASPD patients display `normal` or even `cold` self-report emotional and physiological reactions, except on an implicit cognitive level. This suggests a switch towards anger-related schema modes of ASPD patients on a latent level. Thus, it could be that antisocials can control and avoid activation on a physiological level, but not on an automatic information processing level. Although the effect size of the self-abuse SC-IAT change just failed to be significant in the ASPD group, these data do suggest a trend of antisocials experiencing an increase in self-abuse cognitive associations after confrontation with abuse-related stress. This might suggest latent evidence of a switch to more vulnerable modes (like the Vulnerable Child mode) in ASPD patients too. Taken together, these findings seem to indicate that the ASPD patients` emotional vulnerability, both regarding anger and abuse-related emotions, can be tackled on an indirect cognitive level.

Psychopathy

We did not succeed in collecting enough data on the level of PP of the ASPD patients in order to evaluate the impact of this construct on all ASPD assessments. We did find that antisocials high in PP rated themselves as more demanding and strict towards themselves than their therapists did, and patients scoring high on the PP lifestyle facet rate themselves as more healthy than their therapists did. The latter finding implicates that especially antisocial patients with a high level of impulsivity and irresponsibility rate themselves as more healthy than their therapists. Regarding emotional reactivity, PP was only related to the anger induction in that ASPD patients low in affect indicated a smaller increase in negative emotions and showed a systolic blood pressure decrease. Thus, a low level of affect as assessed with the PCL-r, paralleled low levels of affective reactivity after the anger induction, at least on some indices. These findings indicate that PP does have a differential effect on patient versus therapist report of modes and on direct and physiological anger reactivity. This suggests that antisocials do not constitute a homogeneous group but show different response patterns depending on their PP level.

CLINICAL IMPLICATIONS

Putting schema modes and other theoretical assumptions of SFT to the empirical test keeps therapists and practitioners critical and prevents SFT from becoming a faith-like therapeutic school. It is self-evident that valid mode assessment instruments are of crucial importance for accurate assessment of schema modes. Determining the presence of specific mode sets in specific PDs is a first and essential step in mode conceptualisation of PDs, which can also set the stage for adjusting mode interventions for specific PDs. Experimentally derived mode sets for the different PDs are important in therapy sessions because they can form a general framework for understanding and treating PD pathology. Therapists should be alert for those mode sets that are specific for different PDs. This helps the mode conceptualization phase and reduces the chance of maladaptive modes staying undetected. Accurate assessment instruments

and theoretical frameworks on PD mode conceptualization increases the efficiency of SFT. Furthermore, knowledge on schema-switching processes gives insight into the temporal characteristic of modes and on the sequential processes involved. Also, emotion induction techniques can be used in therapy to enhance mode detection, practice adequate coping strategies, and to test whether emotional confrontation with problematic emotions becomes of less impact as therapy progresses.

Because there is such a strong discrepancy between direct and indirect assessment of schema modes and emotional reactivity of ASPD patients, the use of alternative assessment methods is of special importance for this group. Therefore it is advisable to not merely take the self-reported levels of cognitive, behavioural or emotional phenomena of antisocial patients for granted and to combine them with observations from significant others in the ASPD patient's environment, and/or with behavioural or indirect cognitive or physiological assessment methods.

While lying plays a central role in ASPD, this does not necessary imply that the non-deviant level of self-reported anger of ASPD patients can be attributed to lying. Their low level of self-report, for example, corresponds with their low psychophysiological reactions. In a way, ASPD patients appear to be remarkably well able to control their anger at subjective and physiological levels. This is in line with the idea that these patients have a strongly developed predatory-like aggression. Thus, therapists should keep in mind that inadequate self-report of ASPD patients might not be solely attributable to lying, but may quite adequately reflect their responses.

Since the current dissertation again corroborates the important role of childhood trauma in the etiology of PDs, this stresses the importance of therapists to inquire PD patients about these specific abusive pasts minimising the chance of these pasts staying undetected. Our results also revealed some new associations between trauma's and PD types that are less often subject of systematic trauma assessment, like sexual and emotional abuse in paranoid PD and emotional abuse in schizotypal PD. These findings should alert practitioners to probe these specific patients for this past experiences and orient therapeutic techniques to adequately processing their past. Furthermore, our findings of a higher detection of abusive events by means of the ITEC compared to patient-files stresses the importance of using semi-structured interviews in clinical practice.

LIMITATIONS

Most studies of this dissertation incorporated groups with either `pure` borderline or `pure` antisocial patients, and virtually no overlap between the two disorders was allowed. While this has the clear advantage that it allows to draw disorder-specific conclusions, patients with mixed borderline and antisocial traits are very frequent in practice so it would be informative to assess schema modes, emotional reactivity and traumatic precursors in these mixed-groups.

Since almost all BPD and CIC patients of the studies were collected from in- and outpatient treatment care centres and most ASPD patients from correctional institutes and TBS clinics (Dutch forensic psychiatric hospitals), there is a chance that the findings of this dissertation are biased in this respect. Consequently, findings on e.g. the ASPD patients cannot be generalized to ASPD patients outside the criminal justice system.

Because of the large numbers of participants needed for the studies in this dissertation and the long time it took to recruit them (about three years), most experiments were performed by different experimenters. Although all experimenters were extensively trained according to a standard scenario and the importance of comparability in dealing with the participants was stressed, interpersonal differences between the experimenters cannot be ruled out and could have biased the comparability of the different assessments they conducted.

Although we put a lot of effort into finding sufficient patients of the non-dominant gender of that PD (i.e. male borderline and female antisocial patients), we did not always succeed in obtaining enough participants of both sexes in all groups. Consequently, it was not always possible to assess all gender x group interactions. Therefore, it was not always clear whether findings applied for the patient groups as a whole, or only for the subgroup of the dominant gender of that patient group.

SUGGESTIONS FOR FURTHER STUDIES

Experimental studies on schema modes are still in their infancy. Future studies should formulate and operationalize modes that are hypothesized to be specific for certain PDs, like the Predator and Conning/ Manipulative modes for psychopaths and the Suspicious Overcontroller for the paranoid PD. These modes should be added to the current version of the SMI and psychometrically tested again. Norm groups of the SMI should be constructed in order to facilitate interpretation of the results. Additionally, the influence of emotions other than anger and abuse-related stress on schema mode switching should be tested. Furthermore, since the mode-switching concept supposes a simultaneous change of emotions, cognitions and behaviours, it would be important to test whether these three levels indeed alter synchronized. Also, it would be of importance to test the duration of the mode-related changes. Additionally, it would be of interest to examine whether discrepancy in patient versus therapist mode assessment would fluctuate over time. It could be possible, for example, that patient-therapist mode presence discrepancy would decrease over time due to increased insight of patients in their pathology. Furthermore, it should be critically evaluated whether schema modes have an extra value above the Early Maladaptive Schemas (EMSs) as conceptualized by Young. One way of doing this would be to assess both EMSs and modes in a large sample of PD patients and compare the predictive value of both concepts for PD pathology. Finally, experimental techniques of mode assessment could serve as effect measures. For example, it could be tested whether effectively treated patients show less extreme switches in their modes and less strong implicitly measured mode related associations or physiological or behavioural changes.

Self-report questionnaires, indirect reaction-time based association tasks and psychophysiological measures are all different modalities of trying to assess the `true` presence of modes and emotions in people. Behaviour is another important modality to assess in this respect, especially since behaviour can have important implications for the environment of the patient and society in general. Therefore, it would be important for further studies to test which of these assessment methods are most efficient in predicting behaviour.

Although literature often postulates that self-report of ASPD and PP patients are highly unreliable, not that many empirical studies specified the specific subgroups of forensic patients that would be prone to do this, or circumstances under which antisocials` self-report would be inaccurate. Furthermore, there is a need for information on the underlying reasons for that inaccuracy; whether it is due to lying, lack of insight, faking good or bad or simply the wish to not wanting to share negative (notably `weak`) information about themselves. Eventually, studies like these can provide valuable information on how to increase the reliability of pathology assessment in forensic patients.

Curiously, despite the high similarity between ASPD and PP, experimental studies in the forensic field tend to focus on either ASPD *or* PP subjects, and virtually ignore the presence of the other diagnosis. In order to compare the value of both disorders for the forensic field, there is a need for studies on the differences of both disorders in neurological and emotional correlates, and the predictive value for recidivism and violent behaviour. Furthermore, it is striking that most studies on emotional reactivity in forensic populations focus on abnormal anxiety and fear responses in psychopaths while other emotions remained largely unaddressed. Studies targeting feelings of depression, anger or joy are important to gain insight on the full spectrum of antisocial's and psychopath's emotional lives.

Finally, the current findings suggest the existence of controlled, predatory like aggression in ASPD patients. The question emerges if there will be a point when the anger-stimulus becomes so intense that antisocials` anger becomes uncontrollable. Additionally, it should be studied how subjective, physiological and cognitive indications of emotions alter with increasing intensity of the anger-stimulus or increasing proximity of the perpetrator.

Summary

Borderline personality disorder (BPD) and antisocial personality disorder (ASPD) are two of the most severe and complex personality disorders (PDs). Both patient groups are highly emotional and impulsive (APA, 2005). BPD is predominant in women and mainly characterized by instability in relationships, emotions and behaviour, while ASPD-patients are mostly men that engage in criminal behaviour. Although literature on BPD and ASPD is elaborate, relatively little is known from empirical studies. This dissertation focused on three themes in BPD and ASPD patients, and in some cases in a broader PD group: schema modes, childhood trauma and anger. In this section, the findings of this dissertation will be summarized for each of the chapters for each theme.

SCHEMA MODES

Chapter 2 gives a theoretical description on schema modes. Modes are different cognitive, emotional and behavioural states a person can find him/herself in. Modes can be adaptive or maladaptive and the more severe the pathology of a patient, the larger the number and the more intense the maladaptive modes are. Although Schema-Focussed Therapy aiming at strengthening the healthy modes of BPD patients has shown to lead to a large reduction of BPD pathology (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006), the mode model was never put to the empirical test. As a first and essential step in valid assessment of schema modes, we developed the Schema Mode Inventory (SMI) and subjected it to extensive reliability and validity tests, as described in *Chapter 3.* The SMI fitted well to the hypothesized 14-factor model, better than to other factor models, suggesting that all modes represent distinctive constructs. Furthermore, good to excellent internal reliabilities of the SMI subscales were found, next to excellent test-retest reliability and support for the SMI`s convergent and divergent validity. In addition, the expected monotonically increase of modes from non-patients to axis I to axis II patients was demonstrated, as well as a stronger predictive value by axis II than by axis I pathology of the modes. Overall, it can be concluded that the SMI is of sound psychometric value and therefore can serve as a valuable assessment instrument in Schema-Focused Therapy. *Chapter 4* tested mode conceptualization in patients with BPD and ASPD, next to non-patient controls (NpCs), and found that BPD was characterized by high levels of Abandoned/Abused Child, Angry Child, Detached Protector and Punitive Parent modes. Mode scores of the pathological modes of ASPD patients were in between BPD and NpC, while they indicated a comparable level of Healthy Adult mode to NpCs. *Chapter 5* assessed mode presence in a large sample of mixed PD groups. Overall, very distinct mode patterns emerged, with the number of modes specific for each kind of PD ranging from 1 to 9. The fact that all these mode cluster patterns were unique and mostly supported our hypothesis, underscores the value of the PD mode model. Again, BPD was found to correlate the strongest with the four modes of *Chapter 4,* and also with five additional maladaptive modes. ASPD was linked to the Enraged Child and Bully and Attack modes which stresses the central role of anger and aggression in these patients. In *Chapter 6* mode rating was compared between the patients and their therapists. First, it became apparent that if there was a discrepancy between patient and therapist rating, it was mostly so that therapists indicated a stronger presence of maladaptive modes than the patients themselves.

Furthermore, this patient-therapist discrepancy was significantly stronger for the ASPD than for BPD and cluster C patients. More specifically, therapists` and patients` ratings of BPD and cluster C patients differed significantly for three maladaptive modes, while it differed for 11 modes in ASPD patients. According to the therapists rating, BPD and ASPD patients were much more alike in their mode presence than self-report of these patients indicated. Schema theory assumes rapid changes in a patient's state can be ascribed to a 'switch' in modes. This mode-switching hypothesis was tested by evaluating the effect of mood inductions on mode presentation in *Chapters 9* and *11*. The abuse-related stress induction *(chapter 9)* was expected to specifically increase the presence of the Lonely Child and Detached Protector modes, but also increased the presence of the Enraged Child. *Chapter 11* showed that the anger induction did specifically induce anger related schema modes (i.e. Angry Child, Enraged Child and Bully and Attack modes) and none of the other modes.

CHILDHOOD TRAUMA

Since there were hardly any interviews available that inferred for different types of childhood abuse and neglect that resulted in an objective estimation of the severity of childhood trauma, we developed the Interview for Traumatic Events in Childhood (ITEC). The psychometric evaluation of the ITEC in chapter 7 yielded support for the 5-factor model of the ITEC (i.e. sexual, physical and emotional abuse and physical and emotional neglect), good internal consistency and excellent inter-rater reliability of the subscales. Furthermore, the scales were highly associated with equivalent scales of the Childhood Trauma Questionnaire (indicating good convergent validity), and showed good correspondence with patient file information (reflective of good criterion validity). Chapter 8 assessed the relationships between 10 PDs and five different kinds of trauma. Results indicated that sexual abuse was related to paranoid, schizoid, avoidant and borderline PD; physical abuse to antisocial PD; and emotional neglect to histrionic and borderline PD. Emotional abuse had the most broad association since it was correlated to paranoid, schizotypical and borderline PD, and all cluster C PDs. Chapter 9 assessed the impact of confrontation with abuse-related stimuli (i.e. movie-fragment) on emotional ratings, psychophysiology and implicit cognitive self-abuse association. Results showed that BPD-patients were hyperresponsive on self-reported negative affect and schema modes, psychophysiology and implicit cognitive self-abuse association. The ASPD group was comparable to the BPD group on self-report indices and implicit cognitions but did not show physiological hyper-reactivity. These findings suggest that BPD and ASPD-patients are alike in some abuse-related response patterns, but can be differentiated in their physiological reactivity.

ANGER

Since it was not known from previous studies what was the best way to make people angry in the lab, the study reported in *chapter 10* compared the effectiveness of four often-used anger induction methods: film, stress interview, punishment and harassment. All four methods produced comparable levels of self-reported anger. Regarding physiological reactivity, harassment and interview produced the largest cardiovascular effects, and electrodermal activity increased more in reaction to harassment, interview and punishment conditions compared to film. Harassment produced the most pure anger-feelings since, out of all self-reported emotions, only frustration increased in comparable level to anger following harassment. Next to frustration, the other three anger induction conditions also produced a level of fear that was comparable to that of anger. Thus, while both harassment and interview proved to be the preferable anger induction methods with respect to physiological responsivity, harassment had the extra asset of causing the most specific increase of anger.

Despite this advantage of the harassment condition, the anger induction interview was used in the study of *chapter 11* since this study included highly aggressive patients. In reaction to this anger induction interview, ASPD, BPD and cluster C patients and NpCs all indicated a significant increase in self-reported anger. This level of increase did not differ between the four groups. ASPD patients did however show a psychophysiological under-reactivity following the anger induction reflected in a decrease in heart rate and systolic blood pressure. In contrast, the ASPD group demonstrated a stronger implicit self-anger association after the anger induction than the other groups. So, while self-reported level of anger was not deviant in ASPD patients, their indirect assessed level of anger was in that they displayed a physiological hypo- and an implicit cognitive self-anger hyperresponsivity. Following the animal model of fight response that postulates the fight response is preceded by a vigilance phase in which the fight action is mentally prepared while physiological responses go down, these findings suggest a dominant vigilance phase in antisocials which supports the idea of prominence of predatory-like aggression in these patients.

IN SUM

Taken together, this dissertation provides the first empirical evidence on the hypothesized mode conceptualization of BPD patients (i.e. the Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, Detached Protector and Punitive Parent modes) and ASPD patients (i.e. Enraged Child and Bully and Attack mode). In addition, for the first time, mode presence was tested in other PDs and yielded specific mode clusters for each PD (except for schizotypical and schizoid PD). Importantly, merely basing mode assessment on self-report in ASPD patients might be questionable due to large discrepancies between patient and therapist report in these patients. We found evidence of switching to anger-related modes after an anger induction, while confrontation with abuse-related stress elicited several pathological modes. The kinds of childhood trauma were differently related to separate PDs, with sexual abuse and emotional abuse and neglect being related to BPD and physical abuse to ASPD. Both an anger induction interview and harassment appeared highly effective in eliciting anger in participants. Finally, BPD patients reacted

hyperresponsive to abuse-related stress as measured with several direct and indirect assessment methods, but not following an anger induction. Response patterns of ASPD patients following abuse and anger-related stress appeared highly complex; on self-report levels they did not deviate from other groups, while they displayed indirect cognitive hyperresponsivity and physiological hyporesponsivity.

These findings form an essential step in mode assessment and conceptualization of different PDs. They also illustrate the importance of the use of alternative assessment methods -especially in ASPD patients- and mood inductions for valid assessment of modes, emotions, and behaviour in PDs. Furthermore, this dissertation contributes to valid assessment of childhood trauma and specifying abusive precursors of specific PDs, to pinpointing effective anger induction methods and to elaborate knowledge on anger-related reactivity in BPD and ASPD. Nonetheless, these studies only represent some first steps and a lot of work still needs to be done, especially with respect to schema modes and anger-reactivity in PD populations.

SAMENVATTING (DUTCH SUMMARY)

Borderline persoonlijkheidsstoornis (BPS) en antisociale persoonlijkheidsstoornis (APS) zijn twee van de meest ernstige en complexe persoonlijkheidsstoornissen. Beide groepen patiënten worden gekenmerkt door zeer emotioneel en impulsief gedrag (APA, 2005). BPS komt met name voor bij vrouwen en wordt gekenmerkt door instabiliteit in relaties, emoties en gedrag. APS komt veelal voor bij mannen en de kern van deze stoornis bestaat uit crimineel gedrag. Hoewel er veel geschreven is over BPS en APS, is er vanuit empirisch onderzoek relatief weinig over deze aandoeningen bekend. Dit proefschrift richt zich op drie thema's binnen BPS en APS: schema modi, misbruik in de kindertijd en woede. Sommige hoofdstukken behandelen een bredere groep van persoonlijkheidsstoornissen. In deze samenvatting worden de bevindingen uit alle hoofdstukken van dit proefschrift samengevat voor elk van deze thema's.

SCHEMA MODI

Hoofdstuk 2 geeft een theoretische beschrijving van schema modi. Modi zijn een onderdeel van het Schema-Gerichte model van Young (Young, Klosko, & Weishaar, 2003) en verwijzen naar de verschillende cognitieve, emotionele en gedragsmatige toestandsbeelden waarin een persoon zich kan bevinden. Modi kunnen adaptief of maladaptief zijn en hoe ernstiger de pathologie van een patiënt, hoe groter het aantal en de intensiteit van de maladaptieve modi. Schema-Gerichte therapie richt zich op het versterken van de adaptieve, gezonde modi. Hoewel onderzoek heeft aangetoond dat deze vorm van therapie tot een sterke vermindering van BPS pathologie leidt (Giesen-Bloo, van Dyck, Spinhoven, van Tilburg, Dirksen et al., 2006), is het modus model nooit eerder aan empirische toetsing onderworpen.

Als een eerste essentiële stap in het aantonen van de validiteit van de schema modi, hebben wij de Schema Modus Iventoris (SMI) ontwikkeld en deze aan uitgebreide betrouwbaarheid- en validiteittesten onderworpen, zoals beschreven staat in *hoofdstuk 3*. De SMI had een goede fit voor het gehypothiseerde 14-factoren model (zie appendix), beter dan voor de andere factor modellen, hetgeen suggereert dat alle modi aparte en onderscheidbare constructen reflecteren. Bovendien vonden wij dat de subschalen van de SMI een goede betrouwbaarheid vertoonden zoals bleek uit een uitstekende interne samenhang alsook een uitstekende test-hertest betrouwbaarheid. Tevens bleek dat de SMI een valide instrument is, hetgeen werd aangetoond door een goede convergente en divergente validiteit. Daarnaast konden wij de verwachte monotonische stijging van modi van niet-patiënten, naar as-I patiënten, naar as-II patiënten aantonen. Tevens bleek er een sterkere predictieve waarde voor as-II stoornissen dan voor as-I stoornissen van de modi. Al met al kan er worden geconcludeerd dat de SMI een goede psychometrische kwaliteit heeft en daarom kan dienen als waardevol diagnostisch instrument voor Schema-Gerichte therapie.

Hoofdstuk 4 testte de modus conceptualisatie in patiënten met BPS en APS, vergeleken met niet-patiënt controles (NpCs). Hierbij was opvallend dat de BPS gekenmerkt werd door hoge niveau's van de modi van het Verlaten en Misbruikte Kind; het Woedende Kind; de Onthechte Beschermer; en de Straffende Ouder. De scores op de pathologische modi van de APS patiënten lagen tussen die van de BPS en NpC groepen, met uitzondering van de Gezonde Volwassene modus. Hierin waren diegene met APS en NpCs vergelijkbaar.

In *hoofdstuk 5* werd de aanwezigheid van schema modi in een grote onderzoeksgroep van patiënten met uiteenlopende persoonlijkheidsstoornissen gemeten. Uit dit onderzoek bleek dat de verschillende persoonlijkheidsstoornissen gekenmerkt werden door zeer uiteenlopende patronen van schema modi, en het aantal modi per persoonlijkheidsstoornis varieerde van 1 tot 9. Het feit dat al deze modus patronen uniek waren en veelal overeenstemden met onze hypothesen, benadrukt de waarde van het modus model voor persoonlijkheidsstoornissen. Net als in *hoofdstuk 4*, vonden we ook in *hoofdstuk 5* dat BPS gecorreleerd was met de vier eerder genoemde modi (Verlaten en Misbruikte Kind; het Woedende Kind, de Onthechte Beschermer en de Straffende Ouder), maar ook met vijf andere maladaptieve modi. Bij APS patiënten bleken met name de modi van het Razende Kind en de Pest- en Aanval modus sterk aanwezig, wat de centrale rol van woede en agressie in deze patiënten benadrukt.

In *hoofdstuk 6* werd de modus scoring van de patiënten vergeleken met die van hun therapeuten. Allereerst bleek dat wanneer er een discrepantie was tussen de scores van de patiënten en hun therapeuten, het altijd zo was dat de therapeuten een sterkere aanwezigheid van de maladaptieve modi van de patiënten aangaven dan de patiënten zelf. Verder was deze patiënt-therapeut discrepantie significant sterker bij de APS patiënten dan bij de BPS en Cluster C patiënten. Specifieker gezegd, scoorden de therapeuten voor drie maladaptieve modi significant hoger dan de BPS en Cluster C patiënten, terwijl dit voor de APS groep het geval was voor 11 maladaptieve modi. Verder bleek uit dit hoofdstuk dat de therapeuten veel meer gelijkenis zien in modus-termen tussen de BPS en APS patiënten dan deze patiënten zelf aangeven.

Schema therapie veronderstelt dat snelle wisselingen in het toestandsbeeld van een patiënt toe te schrijven zijn aan een verandering of 'switch' in modi. Deze modus-switch hypothese werd getest in *hoofdstukken 9* en *11* door de deelnemers te confronteren met een misbruik-gerelateerd filmfragment (de zogenaamde misbruik-gerelateerde inductie) en bij hen een interview af te nemen over vroegere ervaringen waarover zij erg boos waren (de zogenaamde woede inductie). Er werd verwacht dat de misbruik-gerelateerde inductie *(hoofdstuk 9)* de aanwezigheid van de Eenzame Kind en de Onthechte Beschermer modi zou verhogen, maar resultaten toonden aan dat ook de sterkte van het Razende Kind verhoogde. In *hoofdstuk 11* vond de woede inductie plaats. Deze studie liet zien dat de woede inductie specifiek woede gerelateerde modi (nl. de modi van het Woedende Kind, het Razende Kind en de Pest- en Aanval) versterkte.

MISBRUIK IN DE KINDERTIJD

Aangezien er geen interviews beschikbaar waren die verschillende soorten misbruik en verwaarlozing in kaart brachten dat resulteerde in een objectieve schatting van de ernst van het misbruik, hebben wij het Interview voor Traumatische Gebeurtenissen in de Kindertijd (ITGK) ontwikkeld. Deze is in *hoofdstuk 7* beschreven. De psychometrische evaluatie van de ITGK leverde bewijs voor het 5-factoren model van de ITGK (nl. sexueel, fysiek en emotioneel misbruik en fysiek en emotionele verwaarlozing), voor goede interne samenhang van de subschalen en uitstekende interbeoordelingsbetrouwbaarheid van de subschalen.

Bovendien bleken de schalen van de ITGK sterk geassocieerd met gelijkwaardige subschalen van de Childhood Trauma Questionnaire (hetgeen duidt op goede convergente validiteit), en toonde de schalen een goede samenhang met de informatie uit het patiëntendossier (hetgeen duidt op goede criterion validiteit).

In *hoofdstuk 8* werden de relaties tussen 10 persoonlijkheidsstoornissen en de 5 soorten misbruik (nl sexueel, fysiek en emotioneel misbruik en emotioneel en fysieke verwaarlozing) onderzocht. Resultaten toonden aan dat sexueel misbruik gerelateerd was aan de paranoide, schizoide, vermijdende en borderline persoonlijkheidsstoornis; fysiek misbruik aan APS; en emotionele verwaarlozing aan de theatrale en de borderline persoonlijkheidsstoornis. Emotioneel misbruik had een brede associatie met persoonlijkheidsstoornissen gezien dit type misbruik gecorreleerd bleek met de paranoide, schizotypische en de borderline persoonlijkheidsstoornis, maar ook met alle Cluster C persoonlijkheidsstoornis stoornissen.

In *hoofdstuk 9* werd het effect onderzocht van een confrontatie met misbruik- gerelateerde stimuli (d.m.v. een filmfragment) op emotionele scores, psychofysiologie en impliciete cognitieve zelf-misbruik associaties. De resultaten toonden aan dat de BPS patiënten hyperresponsief waren op zelf-gerapporteerd negatief affect en schema modi, psychofysiologische reacties en impliciete zelf-misbruik associaties. De APS groep was vergelijkbaar met de BPS groep op zelf-rapportage maten en impliciete cognities, maar toonden niet de fysiologische hyper-reactiviteit zoals de borderline groep. Deze bevindingen suggereren dat BPS en APS patiënten gelijk zijn in bepaalde misbruik-gerelateerde reactiepatronen, maar dat ze van elkaar onderscheiden kunnen worden in hun fysiologische reactiviteit.

WOEDE

Uit eerdere studies was het onduidelijk wat de beste manier was om mensen boos te maken in het laboratorium. Daarom vergeleek de studie van *hoofdstuk 10* de effectiviteit van vier vaak gebruikte woede inductie methoden; film, stress interview, straf en harassment (de deelnemers onterechte negatieve feedback geven op een prestatie). Deze vier methoden bleken even effectief in het verhogen van zelf-gerapporteerde woede. Wat betreft psychofysiologische reacties, produceerde harassment en interview het grootste cardiovasculaire effect, terwijl electrodermale activiteit sterker steeg na de harassment, interview en straf, dan na de film. Harassment produceerde de meest pure woede emoties aangezien van alle zelf-gerapporteerde emoties, enkel frustratie in vergelijkbare mate als woede steeg na harassment. Naast frustratie, wekten de drie andere emotie inductie methoden ook een mate van angst op die vergelijkbaar was met de mate van woede. Dus, terwijl zowel harassment als interview te prefereren zijn op het gebied van fysiologische reactiviteit, heeft harassment het extra voordeel dat deze de meest specifieke stijging van woede veroorzaakt.

Ondanks dit extra voordeel van de harassment methode, werd er voor de studie in *hoofdstuk 11* gebruik gemaakt van de interview methode omdat in deze studie APS patiënten betrokken waren en de kans op agressieve acting-out te hoog was. In reactie op dit woede inductie interview, gaven zowel APS, BPS en Cluster C patiënten als NpCs een significante stijging aan in de mate van zelf-gerapporteerde woede. Deze stijging verschilde niet significant tussen de vier groepen. Wat betreft de psychofysiologie

waren er wel verschillen. De APS patiënten vertoonden een fysiologische onder-reactiviteit na de woede inductie, hetgeen tot uiting kwam in een verlaagde hartslag en systole bloeddruk. Met betrekking tot impliciete associaties, vertoonde deze APS groep in vergelijking met de andere groepen, juist een sterkere impliciete zelf-woede associatie na de woede inductie. Dus, terwijl het zelf-gerapporteerde niveau van woede niet afwijkend was in APS patiënten, was hun indirecte niveau van woede verschillend in die zin dat zij een fysiologische hypo-reactiviteit en een impliciet cognitieve zelf-woede hyper-associatie vertoonden. In het kader van het diermodel van vechtresponsen dat stelt dat de vechtrespons vooraf wordt gegaan door een vigilantie fase waarin de vechtrespons mentaal voorbereid wordt terwijl de fysiologische responsen dalen, suggereren onze bevindingen een dominante vigilantie fase bij antisocialen, wat op zijn beurt het idee van nabijheid van roofdier-achtige agressie in deze patiënten ondersteunt.

SAMENGEVAT

Samengevat levert dit proefschrift het eerste empirisch bewijs over de gehypotiseerde modus conceptualisatie van BPS patiënten (nl. de Kwetsbare, Woedende en Razende Kind modi, de Onthechte Bechermer en de Straffende Ouder modus) en van APS patiënten (nl het Razende Kind en de Straffende Ouder modus). Bovendien werd voor het eerst de modus conceptualisatie getest in andere persoonlijkheidsstoornissen hetgeen specifieke modus clusters opleverde voor alle persoonlijkheidsstoornissen (behalve de schizotypische en schizoide). De resultaten suggereren dat het betwistbaar is om modus sterkte in APS patiënten enkel te baseren op zelf-rapportage gezien de sterke discrepanties tussen patiënt en therapeut rapportage van modi. Wij vonden bewijs voor het switchen naar woede-gerelateerde modi na een woede inductie, terwijl confrontatie met misbruik gerelateerde stress verschillende pathologische modi opriep. Verschillende soorten misbruik uit de kindertijd bleken specifiek gerelateerd te zijn aan de verschillende persoonlijkheidsstoornissen. Zo bleek sexueel misbruik, emotioneel misbruik en verwaarlozing gerelateerd aan BPS en fysiek misbruik gerelateerd aan APS. Zowel het woede inductie interview als de harassment bleken bijzonder effectief in het opwekken van woede in proefpersonen. BPS patiënten reageerden hyperresponsief op misbruik gerelateerde stress op verschillende directe en indirecte niveaus, maar niet in reactie op een woede inductie. De reactiepatronen van APS patiënten na misbruik- en woede gerelateerde stress bleken bijzonder complex; zij verschilden niet van andere groepen op zelf-rapportage niveau, maar vertoonden wel een indirecte cognitieve hyperresponsiviteit en een fysiologische hyporeponsiviteit.

Deze bevindingen vormen een eerste maar belangrijke stap in mode assesment en conceptualisatie van verschillende persoonlijkheidsstoornissen. Ze illustreren het belang van het gebruik van alternatieve meetmethoden –met name in APS patiënten- en stemmingstoornissen voor het valide meten van modi, emoties, en gedrag in persoonlijkheidsstoornissen. Verder draagt dit proefschrift bij aan het valide meten van misbruik in de kindertijd en het specificiëren van misbruik-gerelateerde voorgangers van specifieke persoonlijkheidsstoornissen, in het bepalen van effectieve woede inductie methoden en om kennis te

vergroten naar woede-gerelateerde reactiviteit in BPS en APS. Desondanks zijn deze bevindingen slechts de eerste stappen en moet er nog veel onderzoek verricht worden, met name op het gebied van schema modi en woede-gerelateerde reactiviteit in persoonlijkheidsstoornissen populaties.

REFERENCES

Algina, J., Keselman, H. J., & Penfield, R. D. (2005). An alternative to Cohen`s standardized mean difference effect size: A robust parameter and confidence interval in two independent groups case. *Psychological Medicine, 10, 317-328.*

Altman, D. G. (1991). *Practical statistics for medical research.* Boca Raton, Florida, Chapman & Hall.

American Psychiatric Association (1995). Diagnostic and statistical manual of mental disorders. Washington, DC: American Psychiatric Association.

American Psychiatric Association (2005). *Diagnostic and statistical manual of mental disorders, Fourth edition, text revision*. Washington, DC: American Psychiatric Association.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin, 3*, 411-423.

Anderson, J. C., Linden, W., & Habra, M. E. (2005). The importance of examining blood pressure reactivity and recovery in anger provocation research. *International Journal of Psychophysiology, 57*, 159-163.

Arbuckle, J. L. (2005). *Amos 5 for Windows*. Chicago: Small Waters.

Arntz, A. (1999). Do personality disorders exist? On the validity of the concept and its cognitive-behavioral formulation and treatment. *Behaviour Research and Therapy, 37*, S97–S134.

Arntz, A., & Bögels, S. (2000). *Schemagerichte cognitieve therapie voor persoonlijkheidsstoornissen. [Schema-focused cognitive therapy for personality disorders]*. Houten: Bohn Stafleu van Loghum.

Arntz, A., Dietzel, R., & Dreessen, L. (1999). Assumptions in borderline personality disorder: specificity, stability and relationship with etiological factors. *Behaviour Research and Therapy, 37*, 545-557.

Arntz, A., Dreessen, L., Schouten, E., & Weertman, A. (2004). Beliefs in personality disorders: A test with the Personality Disorder Belief Questionnaire. *Behaviour Research and Therapy, 42*, 1215-1225.

Arntz, A., Klokman, J., & Sieswerda, S. (2005). An experimental test of the schema mode model of borderline personality disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 36*, 226-239.

Arntz, A. & Kuipers, H. (1998). Cognitieve gedragstherapie bij de borderline persoonlijkheidsstoornis. In: Van Tilburg, W. Van den Brink, W. & Arntz, A. (Ed.), *Behandelingsstrategieën bij de Borderline persoonlijkheidsstoornis.* Houten: Bohn Stafleu van Loghum.

Arntz, A., & Weertman, A. (1999). Treatment of childhood memories: Theory and practice. *Behaviour Research and Therapy, 37*, 715-740.

Arntz, A., & Wessel, I. (1996). Jeugd trauma vragenlijst [Dutch version of the Childhood Trauma Inventory]. *Maastricht: Author.*

Ball, S. A., & Cecero, J. J. (2001). Addicted patients with personality disorders: Traits, schemas, and presenting problems. *Journal of Personality Disorders, 15*, 72-83.

Bamber, M. (2004). `The good, the bad and defenceless Jimmy`- A single case study of schema mode therapy. *Clinical Psychology and Psychotherapy, 11*, 425-438.

Bamelis, L., & Arntz, A. (2006). Psychological treatment of personality disorders: A multi-centered randomized controlled trial on the (cost-) effectiveness of Schema-Focussed Therapy. *Manuscript in preparation.*

Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships, 7*, 147-178.

Battle, C. L., Shea, M. T., Johnson, D. M., Yen, S., Zlotnick, C., Zanarini, M. C., et al. (2004). Chilhood maltreatment associated with adult personality disorders: Findings from the collaborative longitudinal personality disorders study. *Journal of Personality Disorders, 18*, 193-211.

Baumeister, R.F., Smart, L. & Boden. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review, 103*, 5-33.

Beck, A. T. (1999). *Prisoners of hate: The cognitive basis of anger, hostility, and violence.* New York: Harper Collins Publishers.

Beck, A.T., Butler, A.C., Brown, G.K., Dahlsgaard, K.K., Newman, C.F. & Beck, J.S. (2001). Dysfunctional beliefs discriminate personality disorders. *Behaviour Research and Therapy, 39,* 1213-1225.

Beck, A., & Freeman, A. (1990). *Cognitive therapy for personality disorders.* New York: The Guildford Press.

Beck, A., Freeman, A., & Davis, D. (2004). *Cognitive Therapy of Personality Disorders, second edition.* New York: The Guilford Press.

Bender, D.S. & Skodol, A.E. (2007). Borderline personality as self-other representational disturbance. *Journal of Personality Disorders, 21*, 500-517.

Bentler, P. M. (1989). *EQS: Structural equations program manual.* Los Angles: BMDP Statistical Software.

Berkowitz, L., & Harmon-Jones, E. (2004). Toward an understanding of the determinants of anger. *Emotion, 4*, 107-130.

Bernstein, D.P., Ahluvalia, T., Pogge, D. & Handelsman, J. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of Academic Child and Adolescent Psychiatry*, *36*, 340-348.

Bernstein, D. P., Arntz, A., & de Vos, M. (2007). Schema Focused Therapy in forensic settings: Theoretical model and recommendations for best clinical practice. *International Journal of Forensic Mental Health, 6*, 169-183.

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

Bernstein, D. P., Stein, J. A., & Handelsman, J. (1998). Predicting personality pathology among adult patients with substance use disorders: Effects of childhood maltreatment. *Addictive Behaviors, 6*, 855-868.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., et al. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27*, 169-190.

Bierer, L. M., Yehuda, R., Schmeidler, J., Mitropoulou, M. A., New, A. S., Silverman, J. M., et al. (2003). Abuse and neglect in childhood: Relationship to personality disorder diagnoses. *CNS Spectrums, 8*, 737-740.

Bifulco, A., Brown, G.W., & Harris, T.O. (1993). *Childhood Experience of Care and Abuse (CECA) childhood interview training package.* Royal Holloway College, London, Mimeo.

Bill, T. (Writer) (1980). *My Bodyguard.* D. Devlin, M. Simon & P. Goldfarb (Producer). United States: Twentieth Century Fox.

Blair, R. J. R. (2003). Neurobiological basis of psychopathy. *Britisch Journal of Psychiatry, 182*, 5-7.

Blais, M. & Norman, D. (1997). A psychometric evaluation of the DSM-IV personality disorder criteria. *Journal of Personality Disorders, 11*, 168–176.

Bolt, D. M., Hare, R. D., Vitale, J. E., & Newman, J. P. (2004). A multigroup item response theory analysis of the Psychopathy Checklist-Revised. *Psychological Assessment, 16*, 155-168.

Boomsma, A. (1982). Robustness of LISREL against small sample sizes in factor analysis models. In K. G. Joreskog & H. Wold (Eds.), *Systems under indirect observation: Causality, structure, prediction (Part I)* (pp. 149-173). Amsterdam: North Holland.

Bornstein, R. F. (1999). Histrionic personality disorder, physical attractiveness and social adjustment. *Journal of Psychopathology and Behavioral Assessment, 21*, 79-94.

Bradley, R., Jenei, J., & Westen, D. (2005). Etiology of borderline personality disorder: Disentangling the contributions of intercorrelated antecedents. *The Journal of Nervous and Mental Disease, 193*, 24-31.

Brewin, C. R. (2000). *Posttraumatic-stress disorder: Malady or myth?* London: Yale University Press.

Briere, J., & Runtz, M. (1990). Differential adult symptomatology associated with three types of child abuse histories. *Child Abuse & Neglect, 14*, 357-364.

Browne, A., & Finkelhor, D. (1987). Impact of child sexual abuse: A review of the research. *Annual Progress in Child Psychiatry and Child Development*, 555-584.

Burgess, A.W., Hartman, C.R. & McCormack, A. (1987). Abused to abuser: Antecedents of socially deviant behavior. *American Journal of Psychiatry, 144*, 1431–1436.

Burns, J. W., Kubilus, A., & Bruehl, S. (2003). Emotion induction moderates effects of anger management style on acute pain sensitivity. *Pain, 106*, 109-118.

Bushman, B.J. & Baumeister, R.F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displayed aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology, 75*, 219-229.

Butler, A. C., Brown, G. K., Beck, A. T., & Grisham, J. R. (2002). Assessment of dysfunctional beliefs in borderline personality disorder. *Behaviour Research and Therapy, 40*, 1231-1240.

Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions, 2nd edition*. New York: The Guilford Press.

Cacioppo, J. T., Klein, D. J., Berntson, G. G., & Hatfield, E. (1993). The psychophysiology of emotion. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions*. New York: The Guilford Press.

Carmen, E., Rieker, P & Mills, T. (1984). Victims of violence and psychiatric illness. *American Journal of Psychiatry, 141*, 378–383.

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Graig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science, 297*, 851-854.

Chase, K. A., O`Leary, D., & Heyman, R. E. (2001). Categorizing partner-violent men within the reactive-proactive typology model. *Journal of Consulting and Clinical Psychology, 69*, 567-572.

Cima, M. (2003). *Faking good, bad and ugly. Malingering in forensic psychiatry inpatients*. Maastricht: Maastricht University.

Cima, M., Merckelbach, H., Hollnack, S., Butt, C., Kremer, K., Schellbach-Matties, R., et al. (2003). The other side of malingering: Supernormality. *The Clinical Neuropsychologist, 17*, 235-243.

Cima, M., Tonnaer, F. & Lobbestael, J. (2007). Moral emotion in reactive and proactive offenders using implicit measures. *Netherlands Journal of Psychology, 63,* 144-155.

Clark, L., & Harrison, J. A. (2000). Assessment instruments. In W. Livesly (Ed.), *Handbook of personality disorders. Theory, research, and treatment* (pp. 277-306). New York: the Guilford Press.

Clarkin, L., & Lenzenweger, M. F. (1996). *Major theories of personality disorder*. New York: The Guilford Press.

Clark, L., Livesly, W., & Morey, L. (1997). Special feature: Personality disorder assessment: The challenge of construct validity. *Journal of Personality Disorders, 11*, 205-231.

Cleckley, H.M. (1976). *The mask of sanity*, 5th ed. St Louis, MO: Mosby.

Cloninger, R. C., Przybeck, T. R., Svrakic, D. M., & Wetzel, R. D. (1994). *The Temperament and Character Inventory (TCI): A guide to its development and use*. Washington University: Center for Psychobiology of Personality.

Cohen, J. D. (1992). A power primer. *Psychological Bulletin, 112*, 155-159.

Damen, K. F. M., Van der Kroft, P. J. A., & De Jong, C. A. J. (2004). Inter-rater reliability of the Structured Interview for DSM-IV Personality in an opioid-dependent patient sample. *European Addiction Research, 10*, 99-104.

De Houwer, J. (2002). The implicit association test as a tool for studying dysfunctional associations in psychopathology: strenghts and limitations. *Journal of Behavior Therapy and Experimental Psychiatry, 33*, 115-133.

De Houwer, J. (2003). Extrinsic Affective Simon Task. *Experimental Psychology, 30*, 77-85.

De Houwer, J. (2006). What are implicit measures and why are we using them? In R. Wiers & A. Stacy (Eds.), *Handbook of implicit cognition and addiction* (pp. 11-28). CA: SAGE: Thousand Oaks.

De Houwer, J., & De Bruycker, E. (2006). The identification-EAST as a valid measure of implicit attitudes toward alcohol-related stimuli. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 133-143.

de Jong, C. A. J., Derks, F. C. H., van Oel, C. J., & Rinne, T. (1997). *Gestructureerd Interview voor de DSM-IV Persoonlijkheidsstoornissen [Structured Interview for DSM-IV Personality Disorders]*. Sint Oedenrode, the Netherlands: Stichting Verslavingszorg Oost Brabant.

de Jong Gierveld, J., & van Tilburg, T. G. (1999). *Manual of the loneliness scale*. Vrije Universiteit Amsterdam, Department of Social Research Methodology.

de Ruiter, C., & Greeven, P. G. J. (2000). Personality disorders in a Dutch forensic psychiatric sample: Convergence of interview and self-report measures. *Journal of Personality Disorders, 14*, 162-170.

Dimsdale, J. E., Stern, M. J., & Dillon, E. (1988). The stress interview as a tool for examining physiological reactivity. *Psychosomatic Medicine, 50*, 64-71.

Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201-218). Hillsdale: Erlbaum.

Dodge, K.A., Pettit, G.S., Bates, J.E. & Valente, E. (1995). Social information-processing patterns mediate for the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology, 140*, 632–643.

Dollard, J., Doob, L., Miller, N., Mowrer, O., & Sears, R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.

Douglas, C. (1991). Lie detection: Lies and truths. In R. Cochrane & D. Douglas (Eds.), *Psychology and social issues: A tutorial text*. Oxford: Falmer Press/Taylor & Francis, Inc.

Dovidio, J. F., Kawakami, K., & Beach, K. R. (2001). Implicit and explicit attitudes: Examination of the relationship between measures of intergroup bias. In R. Brown & S. Gaertner (Eds.), *Blackwell Handbook of Social Psychology* (pp. 175-197). Malden, MA: Blackwell.

Dreessen, L., & Arntz, A. (1995). *The Personality Disorder Beliefs Questionnaire*. Maastricht: Maastricht University.

Duijsens, I., & Spinhoven, P. (2000). *Handleiding van de Nederlandse Temperament en Karakter Vragenlijst [Manual of the Dutch Temperament and Character Inventory]*. Leiderdorp: Datec.

Duijsens, I., Spinhoven, P., Goekoop, J., Spermon, J., & Eurelings-Bontekoe, E. (2000). The Dutch temperament and character inventory (TCI): Structure, reliability and validity in a normal and psychiatric outpatient population. *Personality and Individual Differences, 28*, 487-499.

Dutton, D. G., & Hart, S. D. (1992). Evidence for long-term, specific effects of childhood abuse and neglect on criminal behavior in men. *International Journal of Offender Therapy and Comperative Criminology, 36*, 129-137.

Egeland, B. (1979). Preliminary results of a prospective study of the antecedents of child abuse. *Child Abuse & Neglect, 3*, 269-278.

Egeland, B., Jacobvitz, D., & Sroufe, A. (1988). Breaking a cycle of abuse. *Child Development, 59*, 1080-1088.

Ekman, P., Levinson, R. W., & Friesen, W. V. (1983). Autonomic nervous system activity distinguishes among emotions. *Science, 221*, 1208-1210.

Elliott, D. M. (1997). Traumatic events: Prevalence and delayed recall in the general population. *Journal of Consulting and Clinical Psychology, 65*, 811-820.

Ellis, A. (1962). *Reason and emotion in psychotherapy.* New York: Lyle-Stuart.

Engebretson, T. O., Sitora, A. D., Niaura, R. S., Edwards, K., & Brown, W. A. (1999). A simple laboratory method for inducing anger: A preliminary investigation. *Journal of Psychosomatic Research, 47*, 13-26.

Engelhard, I. M., van den Hout, M.A., Schouten, E. (2007). Neuroticism, `negative disambiguation` and self reported sexual abuse. *Manuscript in preparation.*

Fanselow, M. S., & Lester, L. S. (1988). A functional behavioristic approach to aversively motivated behavior: Predatory imminence as a determimant of the topography of defensive behavior. In R. C. Bolles & M. D. Beecher (Eds.), *Evolution and Learning* (pp. 185-211). Hillsdale, New York: Lawrence Erlbaum Associates Inc.

Fink, L., Bernstein, D.P., Handelsman, J., Foote, J. & Lovejoy, M. (1995). Initial reliability and validity of the childhood trauma interview: a new multidimensional measure of childhood interpersonal trauma. *American Journal of Psychiatry, 152*, 1329-1335.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. (1997). *Structured clinical interview for DSM-IV Axis I disorders (SCID I).* New York: Biometric Research Department.

First, M., Spitzer, R., Gibbon, M., Williams, J., & Benjamin, L. (1994). *Structured clinical interview for DSM-IV Axis II personality disorders (SCID II).* New York: Biometric Research Department.

Fossati, A., Donati, D., Donini, M., Novella, L., Bagnato, M., & Maffei, C. (2001). Temperament, character, and attachment patterns in borderline personality disorder. *Journal of Personality Disorders, 15*, 390-402.

Fossati, A., Madeddu, F., & Maffei, C. (1999). Borderline personality disorder and childhood sexual abuse: a meta-analytic study. *Journal of Personality Disorders, 13*, 268-280.

Frijda, N. (1988). The laws of emotions. *American Psychologist, 43*, 349-358.

Frijda, N. (2005). Emotion experience. *Cognition and Emotion, 19*, 473-497.

Frijda, N. (1986). *The emotions.* Cambridge: Cambridge University Press.

Gacono, C. B., & Meloy, J. R. (1994). *The Rorschach assessment of aggressive and psychopathic personalities.* Hillsdale, New York: Erlbaum.

Garcia-Leon, A., Reyes del Paso, G. A., Robles, H., & Vila, J. (2003). Relative effects of harassment, frustration, and task characteristics on cardiovascular reactivity. *International Journal of Psychophysiology, 47*, 159-173.

Gardner, D. L., Leibenluft, E., O'Leary, K. M., & Cowdry, R. W. (1991). Self-ratings of anger and hostility in borderline personality disorder. *Journal of Nervous and Mental Disease, 179,* 157-161.

Geisinger, K.F. (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment, 6,* 304-312.

Gendolla, G. H. E., Abele, A. E., & Krüsken, J. (2001). The informational impact of mood on effort mobilization: A study of cardiovascular and electrodermal responses. *Emotion, 1*, 12-24.

Gendolla, G. H. E., & Krüsken, J. (2002). The joint effect of informational mood impact and performance-contingent consequences on effort-related cardiovascular response. *Journal of Personality and Social Psychology, 83*, 271-283.

Giesen-Bloo, J. & Arntz, A (2005). World assumptions and the role of trauma in borderline personality disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 36,* 197-208.

Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., et al. (2006). Outpatient psychotherapy for borderline personality disorder. Randomized trial of Schema-Focused Therapy versus Transference-Focused Psychotherapy. *Archives of General Psychiatry, 63*, 649-658.

Gilbert, S., & Thompson, J. K. (1999). Winning or losing against an opposite-sex peer in a gender-based competitive task. *Sex Roles, 41*, 875-899.

Glodich, A. (1998). Traumatic exposure to violence: A comprehensive review of the child and adolescent literature. *Smith College Studies in Social Work, 68,* 321-345.

Golier, J. A., Yehuda, R., Bierer, L. M., Mitropoulou, V., New, A. S., Schmeidler, J., et al. (2003). The relationship of borderline personality disorder to posttraumatic stress disorder and traumatic events. *American Journal of Psychiatry, 160*, 2018-2024.

Graham, F. K., & Clifton, R. K. (1966). Heart-rate change as a component of the orienting response. *Psychological Bulletin, 65*, 305-320.

Grann, M., Langström, N., Tengström, A., & Kullgren, G. (1999). Psychopathy (PCL-R) predicts violent recidivism among criminal offenders with personality disorders in Sweden. *Law and Human Behavior, 23,* 205-217.

Gray, N. S., Brown, A. S., MacCulloch, M. J., Smith, J., & Snowden, R. J. (2005). An implicit test of the association between children and sex in pedophiles. *Journal of Abnormal Psychology, 114*, 304-308.

Gray, N.S., MacCulloch, M.J., Smith, J., Morris, M., Snowden, R.J. (2003). Violence viewed by psychopathic murderers. Adapting a revealing test may expose those psychopaths who are most likely to kill. *Nature, 423,* 497-498.

Greenwald, A. G., & Farnham, S. D. (2000). Using the Implicit Association Test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79*, 1022-1038.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: the implicit association task. *Journal of Personality and Social Psychology, 74*, 1464-1480.

Griffin, D. W., & Bartholomew, K. (1994). The Metaphysics of Measurement: The Case of Adult Attachment. In K. Bartholomew & D. Perlman (Eds.), *Advances in personal relationships: Attachment Processes in Adult Relationships* (Vol. 5, pp. 17-52). London: Jessica Kingsley.

Griffing, S., Lewis, C. S., Chu, M., Sage, R., Jospitre, T., Madry, L., et al. (2006). The process of coping with domestic violence in adult survivors of childhood sexual abuse. *Journal of Child Sexual Abuse, 15*, 23-41.

Gross, J. J., & Levenson, R. W. (1995). Emotion elicitation using films. *Cognition and Emotion, 9*, 87-108.

Gunderson, J. G., & Zanarini, M. C. (1987). Current overview of the borderline diagnosis. *Journal of Clinical Psychiatry, 48*, 5-11.

Haeyen, S. (2006). Imaginatie in beeldende therapie. Een schemagerichte benadering. [Imagination in imaging therapy: A schema focussed approach]. *Tijdschrift voor vaktherapie, 1*, 3-8.

Halmi, K.A., Tozzi, F., Thornton, L.M., Crow, S., Fichter, M.M., & Kaplan, S.J. (2005). The relation among perfectionism, obsessive-compulsive personality disorder and obsessive-compulsive disorder in individuals with eating disorders. *International Journal of Eating Disorders, 38*, 371-374.

Hare, R. D. (1982). Psychopathy and physiological activity during anticipation of an aversive stimulus in a distraction paradigm. *Psychophysiology, 19*, 266-271.

Hare, R. D. (1991). *The Hare Psychopathy Cecklist Revised.* Toronto, Ontario: Multi-Health Systems.

Hare, R. D. (1996). Psychopathy and antisocial personality disorder: A case of diagnostic confusion. *Psychiatric Times, 13*

Hare, R. D. (2003). *Manual for the Revised Psychopathy Checklist (2nd edition).* Toronto, Ontario, Canada: Multi-Health Systems.

Hare, R. D., Harpur, T. J., Hakstian, A. R., Forth, A. E., Hart, S. D., & Newman, J. P. (1990). The Revised Psychopathy Checklist: Reliability and factor structure. *Psychological Assessment, 2*, 338-341.

Harmon-Jones, E., Sigelman, J., Bohlig, A., & Harmon-Jones, C. (2003). Anger, coping, and frontal cortical activity: The effect of coping potential on anger-induced left frontal activity. *Cognition and Emotion, 17*, 1-24.

Herman, J.L, Perry, J.C., & van der Kolk, B.A. (1998). Childhood trauma in borderline personality disorder. *American Journal of Psychiatry, 146*, 490–495.

Herpertz, S. C., Gretzer, A., Muhlbauer, V., Steinmeyer, E. M., & Stass, H. (1998). Experimental detection of inadequate affect regulation in patients with self-mutilating behavior. *Nervenarzt, 69*, 410-418.

Herpertz, S. C., Gretzer, A., Steinmeyer, E. M., Muehlbauer, V., Schuerkens, A., & Sass, H. (1997). Affective instability and impulsivity in personality disorder. Results of an experimental study. *Journal of Affective Disorders, 44*, 31-37.

Herpertz, S. C., Kunert, H. J., Schwenger, U. B., & Sass, H. S. (1999). Affective responsiveness in Borderline Personality Disorder: A psychophysiological approach. *American Journal of Psychiatry, 156*, 1550-1556.

Herpertz, S. C., Schwenger, U. B., Kunert, H., Lukas, G., Gretzer, U., Nutzmann, J., et al. (2000). Emotional responses in patients with borderline as compared with avoidant personality disorder. *Journal of Personality Disorders, 14*, 339-351.

Herpertz, S.C., Werth, U., Lukas, G., Qunaibi, M., Schuerkens, A., Kunert, H., et al. (2001). Emotion in criminal offenders with psychopathy and borderline personality disorder. *Archives of General Psychiatry, 58*, 737-745.

Harris, G. T., & Rice, M. E. (2006). Treatment of psychopathy: A review of empirical findings. In C. Patrick (Ed.), *Handbook of psychopathy* (pp. 555-572). New York: Guilford Press.

Hibbert, G. (Writer), & P. Kosminsky (Director) (1997). No child of mine. United Kingdom: Stonehenge Films / United Productions.

Hildebrand, M., & de Ruiter, C. (2004). PCL-R psychopathy and its relation to DSM-IV Axis I and Axis II disorders in a sample of male forensic psychiatric patients in the Netherlands. *International Journal of Law and Psychiatry, 27,* 233-248.

Holdwick, D. J., Hilsenroth, M. J., Castlebury, F. D., & Blais, M. A. (1998). Identifying the unique and common characteristics among the DSM-IV antisocial, borderline and narcissistic personality disorders. *Comprehensive Psychiatry, 39*, 277-286.

Holzinger, K. J. (1944). A simple method of factor analysis. *Psychometrika, 9*, 247-262.

Horwitz, C.V., Widom, C.S., McLaughlin, J. & White, H.R. (2001). The impact of childhood abuse and neglect on adult mental health: A prospective study. *Journal of Health and Social Behavior, 42,* 184–201.

Hudziak, J. J., Boffeli, T. J., Kriesman, M. D., Battaglia, M. M., Stranger, C., & Guze, S. B. (1996). Clinical study of the relation of borderline personality disorder to Briquet`s syndrome (Hysteria), somatization disorder, antisocial personality disorder, and substance abuse disorder. *American Journal of Psychiatry, 153*, 1598-1606.

Ishikawa, S. S., Raine, A., Lencz, T., Bihrle, S., & LaCasse, L. (2001). Autonomic stress reactivity and executive functions in successful and unsuccessful criminal psychopaths from the community. *Journal of Abnormal Psychology, 110*, 423-432.

Jacob, G. A., Guenzler, C., Zimmermann, S., Scheel, C. N., Ruesch, N., Leonhart, R., et al. Time course of anger and other emotions in women with borderline personality disorder- a preliminary study. *Journal of Behavior Therapy and Experimental Psychiatry.* In press.

Jäncke, L. (1996). Facial EMG in an anger-provoking situation: individual differences in directing anger outwards or inwards. *International Journal of Psychophysiology, 23*, 207-214.

Johnson, N.S. (1979). Nonnull properties of Kendall`s partial rank correlation coefficient. *Biometrika, 66*, 333-337.

Johnson, J. G., Cohen, P., Brown, J., Smailes, E. M., & Bernstein, D. P. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry, 56*, 600-606.

Johnson, J. G., Cohen, P., Chen, H., Kasen, S., & Brook, J. S. (2006). Parenting behaviors associated with risk for offspring personality disorder during adulthood. *Archives of General Psychiatry, 63*, 579-587.

Johnson, D. M., Shea, M.T., Yen, S., Battle, C.L., Zlotnick, C., Sanislow, C.A., et al. (2003). Gender differences in borderline personality disorder: Findings from the collaborative longitudinal personality disorders study. *Comprehensive Psychiatry*, *44*, 284-292.

Johnson, J. G., Smailes, E. M., Phil, M., Cohen, P., Brown, J., & Bernstein, D. P. (2000). Associations between four types of childhood neglect and personality disorder symptoms during adolescence and early adulthood: Findings of a community-based longitudinal study. *Journal of Personality Disorders, 14*, 171-187.

Jöreskog, K. G., & Sörbom, D. (2001). *LISREL 8.54*. Chicago: Scientific Software International.

Jovev, M., & Jackson, H. J. (2004). Early maladaptive schemas in personality disordered individuals. *Journal of Personality Disorders, 18*, 467-478.

Kaplan, S. J., Pelcovitz, D., & Labruna, V. (1999). Child and adolescence abuse and neglect research: A review of the past 10 years. Part I: Physical and emotional abuse and neglect. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*, 1214-1222.

Karpinski, A., & Steinman, R. B. (2006). The Single Category Implicit Association Test as a measure of implicit social cognition. *Journal of Personality and Social Psychology, 91*, 16-63.

Kendall-Tackett, K. A., Williams, L. M., & Finkelhor, D. (2001). Impact of sexual abuse on children: A review and synthesis of recent empirical studies. In R. Bull (Ed.), *Children and the law: The essential readings* (pp. 31-76). Malden, MA, US: Blackwell Publishing.

Kimbrell, T. A., George, M. S., Parekh, P. I., Ketter, T. A., Podell, D. M., Danielson, A. L., et al. (1999). Regional Brain Activity during Transient Self-Induced Anxiety and anger in Healthy Adults. *Society of Biological Psychiatry, 46*, 454-465.

Klokman, J., Arntz, A., & Sieswerda, S. (2001). *The schema mode questionnaire (state and trait version), internal document*. Maastricht: Maastricht University.

Klonsky, E. D., Oltmanns, T. F., & Turkheimer, E. (2002). Informant-reports of personality disorders: Relation to self-report and future research directions. *Clinical Psychology: Science and practice, 9*, 300-311.

Koenigsberg, H. W., Harvey, P. D., Mitropoulou, V., Schmeidler, J., New, A. S., Goodman, M., et al. (2002). Characterizing affective instability in borderline personality disorder. *American Journal of Psychiatry, 159*, 784-788.

Koopmans, P. C., Sanderman, R., Timmerman, I., & Emmelkamp, P. M. G. (1994). The Irrational Belief Inventory (IBI): Development and psychometric evaluation. *European Journal of Psychological Assessment, 10*, 15-27.

Kremers, I. P., Van Giezen, A.E., Van der Does, A.J.W., van Dyck, R. & Spinhoven, Ph. (2007). Memory of childhood trauma before and after long-term psychological treatment of borderline personality disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 38, 1-10.

Lacey, J. I., & Lacey, B. C. (1958). Verification and extension of the principle of response-stereotypy. *American Journal of Psychiatry, 71*, 50-73.

Lang, P. J., David, M., & Öhman, A. (2000). Fear and anxiety: animal models and human cognitive psychophysiology. *Journal of Affective Disorders, 61*, 137-159.

Lee, C. W., Taylor, G., & Dunn, J. (1999). Factor structure of the schema-questionnaire in a large clinical sample. *Cognitive Therapy and Research, 23*, 441-451.

Levenson, R. W. (1992). Autonomic nervous system differences among emotions. *Psychological Science, 3*, 23-27.

Levine, D., Marziali, E., & Hood, J. (1997). Emotion processing in borderline personality disorders. *Journal of Nervous and Mental Disease, 185*, 240-246.

Limentani, A. (1981). From denial to self-awareness: A 20 years' study of a case of childhood delinquency evolving into adult neurosis. *Britisch Journal of Medical Psychology, 54*, 175-186.

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

Lish, J. D., Kavoussi, R. J., & Coccaro, E. F. (1996). Aggressiveness. In C. G. Costello (Ed.), *Personality characteristics of the personality disordered* (pp. 24-47). New York: John Wiley and Sons Inc.

Lobbestael, J., Arntz, A. & Bernstein, D. Disentangling the relationship between different types of childhood trauma and personality disorders. *Submitted for publication.*

Lobbestael, J., Arntz, A., Cima, M. & Chakhssi, F. Effects of induced anger in patients with antisocial personality disorder. *Submitted for publication.*

Lobbestael, J., Arntz, A., Harkema-Schouten, P. & Bernstein, D. Development and psychometric evaluation of a new assessment method for childhood trauma: the Interview for Traumatic Events in Childhood (ITEC). *Submitted for publication.*

Lobbestael, J., Arntz, A., Kremers, I. & Sieswerda, S. (2006). *The Interview for Traumatic Events in Childhood.* Maastricht: Maastricht University.

Lobbestael, J., Arntz, A., & Sieswerda, S. (2005). Schema modes and childhood abuse in borderline and antisocial personality disorders. *Journal of Behavior Therapy and Experimental Psychiatry, 36*, 240-253.

Lobbestael, J., Arntz, A., & Wiers, R. W. (2008). How to push someone's buttons: A comparison of four anger induction methods. *Cognition and Emotion, 22*, 353-373.

Lobbestael, J., van Vreeswijk, M.F., Arntz, A. (2007). Shedding light on schema modes: A clarification of the mode concept and its current research status. *Netherlands Journal of Psychology, 63*, 76-85.

Lobbestael, J., van Vreeswijk, M.F. & Arntz, A. An empirical test of schema mode conceptualizations in personality disorders. *Submitted for publication.*

Lobbestael, J., van Vreeswijk, M.F., Arntz, A., & Spinhoven, P. The reliability and validity of the Schema Mode Inventory (SMI). S*ubmitted for publication.*

Loerber, R., & Dishion, T. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin, 94*, 68-99.

Luster, T., Small, S.A. & Lower, R. (2002). The correlates of abuse and witnessing abuse among adolescents. *Journal of Interpersonal Violence,* 17, 1323-1340.

Maffei, C., Fossati, A., Agostoni, I., Barraco, A., Bagnato, M., Deborah, D., et al. (1997). Inter-rater reliability consistency of the structural clinical interview for DSM-IV Axis II personality disorders (SCID-II, Version 2.0). *Journal of Personality Disorders, 11*, 279-284.

Malatesta-Magai, C., Shepard, B., Jonas, R., & Culver, L. (1992). Type A behavior pattern and emotion expression in younger and older adults. *Psychology and Aging, 7*, 551-561.

Marchall, L.A. & Cooke, D.J. (1999). The childhood experiences of psychopaths: A retrospective study of familial and societal factors. *Journal of Personality Disorders, 13*, 211–225.

Margolin, G., & Gordis, E. B. (2000). The effects of family and community violence on children. *Annual Review of Psychology, 51*, 445-479.

Martin, M. (1990). On the induction of mood. *Clinical Psychology Review, 10*, 669-697.

Martin, C. S., Pollock, N. K., Bukstein, O. G. & Lynch, K. G. (2000). Inter-rater reliability of the SCID alcohol and substance use disorder section among adolescents. *Drug and Alcohol Dependence, 59*, 173-176.

MacCallum, R. C., Zhang, S., Hong, S., & Widaman, K. F. (1999). Sample Size in Factor Analysis. *Psychological Methods, 4*, 84-99.

McCord, W., & McCord, J. (1964). *The psychopath: An essay on the criminal mind.* New York: Van Nostrand.

McGinn, L.K. & Young, J.E. (1996). Schema-focused therapy. In: Salkovskis, P.M. Editor, *Frontiers of cognitive therapy.* New York: The Guilford Press.

McManus, M., Alessi, N. E., Grapentine, W. L., & Brickman, A. (1984). Psychiatric disturbance in serious delinquents. *Journal of the American Academy of Child & Adolescent Psychiatry, 23*, 602-615.

McNair, D. M., Lorr, M., & Droppleman, L. F. (1992). *Manual for the Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Services.

Meloy, J. R. (1988). *Psychopathic mind: origin, dynamics, and treatment.* Northvale, NJ: Aronson.

Milon, T. (1981). *Disorders of personality: DSM-III: Axis II.* New York: Wiley.

Moreno, J. K., Selby, M. J., & Neal, S. (1998). Psychopathology in sexually abused and non-sexually abused eating disordered women. *Journal of Psychotherapy in Independent Practice, 17*, 1-9.

Morey, L.C., Hopwood, C.J., Gunderson, J.G., Skodol, A.E., Shea, M.T., Yen, S., et al. (2007). Comparison of alternative models for personality disorders. *Psychological Medicine, 37*, 983-994.

Mucha, R. F., Pauli, P., & Weyers, P. (2006). Psychophysiology and implicit cognition in drug use: Significance and measurement of motivation for drug use with emphasis on startle tests. In R. W. Wiers & A. W. Stacy (Eds.), *Handbook of implicit cognotion and addiction.* California: Thousand Oaks.

Nadort, M. Implementation of out-patient schema-focused therapy for borderline personality disorder in regular psychiatry. *Manuscript in preparation.*

Niedenthal, P. M., Barsalou, L. W., Ric, F., & Krauth-Gruber, S. (2005). Embodiment in the acquisition and use of emotion knowledge. In L. F. Barrett, P. M. Niedenthal & P. Winkielman (Eds.), *Emotion and consciousness* (pp. 21-50). New York: Guilford Press.

Nordahl, H.M. & Nysæter, T.E. (2005). Schema therapy for patients with borderline personality disorder: A single case series, *Journal of Behavior Therapy and Experimental Psychiatry, 36,* 254-264.

Nunnally, J. C. (1967). *Psychometric theory.* New York: McGraw-Hill.

Obrist, P. A. (1976). The cardiovascular-behavioral interaction -- As it appears today. *Psychophysiology, 13*, 95-107.

Obrist, P. A., Wood, D. M., & Perez-Reyes, M. (1965). Heart rate during conditioning in humans: Effects of UC intensity, vegal blockade and adrenergic block vasomotor activity. *Journal of Experimental Psychology, 70,* 32-42.

Oldfield, M. (2001). Tubural Bells part one. On *Tubural Bells*. United Kingdom: Virgin.

Oldham, J.M., Skodol, A.E., Kellman, H.D., Hyler, S.E., Rosnick, L., Davies, M. (1992). Diagnosis of DSM-III-R personality disorders by two structured interviews: Patterns of comorbidity. *American Journal of Psychiatry, 149*, 213-220.

Paris, J. (1997). Antisocial and borderline personality disorders: Two seperate diagnoses or two aspects of the same psychopathology? *Comprehensive Psychiatry, 38*, 237-242.

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

Paris, J., Zweig-Frank, H., & Guzder, J. (1994b). Risk factors for borderline personality in male outpatients. *Journal of Nervous and Mental Disease, 182*, 375-380.

Patrick, C. J., Zempolich, K. A., & Levenston, G. K. (1997). Emotionality and violent behaviour in psychopaths: a biosocial analysis. In D. P. Farrington, S. A. Mednick, A. Raine & P. A. Brennan (Eds.), *Biosocial bases of violence* (pp. 145-161). New York: Plenum Publishing Corp.

Pham, T. H., Philippot, P., & Rime, B. (2000). Subjective and autonomic responses to emotion induction in psychopaths. *L`Encephale, 26*, 45-51.

Pham, T.H., Vanderstukken, O., Philippot, P., & Vanderlinden, M. (2003). Selective attention and executive functions deficits among criminal psychopaths. *Aggressive Behavior, 29*, 393-405.

Philippot, P. (1993). Inducing and assessing differentiated emotion-feeling states in the laboratory. *Cognition and Emotion, 7*, 171-193.

Petrocelli, J. V., Glaser, B. A., Calhoun, G. B., & Campbell, L. F. (2001). Early Maladaptive Schemas of personality disorder subtypes. *Journal of Personality Disorders, 15*, 546-559.

Pfohl, B., Blum, N., & Zimmerman, M. (1995). *Structured Interview for DSM-IV Personality (DSM-IV).* Iowa City: Department of Psychiatry, University of Iowa.

Pollock, V.E., Briere, J., Schneider, L., Knop, J., Mednick, S.A. & Goodwin, D.W (1990). Childhood antecedents of antisocial behavior: Parental alcoholism and physical abusiveness. *American Journal of Psychiatry, 147*, 1290-1293.

Raine, A. (1993). Features of borderline personality and violence. *Journal of Clinical Psychology, 49*, 277-281.

Raczek, S. W. (1992). Childhood abuse and personality disorders. *Journal of Personality Disorders, 6*, 109-116.

Raskin, R., Novacek, J. & Hogan, R. (1991a). Narcissistic self-esteem management. *Journal of Personality and Social Psychology, 60*, 911-918.

Raskin, R., Novacek, J. & Hogan, R. (1991b). Narcissism, self-esteem, and defensive self-enhancement. *Journal of Personality, 59*, 19-38.

Roberts, R. J., & Weerts, T. C. (1982). Cardiovascular responding during anger and fear imagery. *Psychological Report, 50*, 219-230.

Robins, L. N., Tipp, J., & Pzybeck, T. (1991). Antisocial personality. In L. n. Robins & D. A. Regier (Eds.), *Psychiatric disorders in America: The epidemiological Catchment Area Study* (pp. 258-290). New York: The Free Press.

R Development Team (2007). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for statistical computing.

Renneberg, B., Heyn, K., Gebhard, R., Bachmann, S. (2005). Facial expression of emotions in borderline personality disorder and depression. *Journal of Behavior Therapy and Experimental Psychiatry, 36*, 183-196.

Rijkeboer, M., van den Bergh, H., Arntz, A., Gijs, L., & van den Bout, J. The nature of early maladaptive schemas: A comparison with temperament and character. *Manuscript submitted for publication.*

Rijkeboer, M. M., van den Bergh, H., & Arntz, A. Relationships between early maladaptive schemas and the five-factor model of personality. *Manuscript submitted for publication.*

Rijkeboer, M., van den Bergh, H., & van den Bout, J. (2005). Stability and discriminative power of the Young Schema Questionnaire in a Dutch clinical versus non-clinical population. *Journal of Behavior Therapy and Experimental Psychiatry, 36*, 129-144.

Rijkeboer, M., van den Bergh, H., & van den Bout, J. Reliability and dimensionality of the Dutch Young Schema-Questionnaire in a clinical versus nonclinical population. *Manuscript submitted for publication.*

Robins, L. N., Tipp, J., & Pzybeck, T. (1991). Antisocial personality. In L. n. Robins & D. A. Regier (Eds.), *Psychiatric disorders in America: The epidemiological Catchment Area Study* (pp. 258-290). New York: The Free Press.

Rutter, M., & Silberg, J. (2002). Gene-environment interplay in relation to emotional and behavioral disturbance. *Annual Review of Psychology, 53*, 463-490.

Sabo, A.N. (1997). Etiological significance of associations between childhood trauma and borderline personality disorder: Conceptual and clinical implications. *Journal of Personality Disorders, 11*, 50-70.

Saylor, K. I. (2003). The assessment of personality disorders: A comparison of five semi-structured interviews. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 2003,* 12-B.

Scher, C. D., Stein, M.B., Asmundson, G.J.G., McCreary, D.R. & Forde, D.R. (2001). The Childhood Trauma Questionnaire in a community sample: Psychometric properties and normative data. *Journal of Traumatic Stress, 14*, 843-857.

Scherer, K. R., & Tannenbaum, P. H. (1986). Emotional experiences in everyday life: A survey approach. *Motivation and Emotion, 10*, 295-314.

Schmahl, C. G., Elzinga, B. M., Ebner, U. W., Simms, T., Sanislow, C., Vermetten, E., et al. (2004). Psychophysiological reactivity to traumatic and abandonment scripts in borderline personality and posttraumatic stress disorders: a preliminary report. *Psychiatry Research, 126*, 33-42.

Schmahl, C. G., Elzinga, B. M., Vermetten, E., Sanislow, C., McGlashan, T. H., & Bremmer, J. D. (2003). Neural correlates of memories of abandonment in women with and without borderline personality disorder. *Biological Psychiatry, 54*, 142-151.

Schmahl, C. G., Vermetten, E., Elzinga, B. M., & Bremner, J. D. (2004). A positron emission tomography study of memories of childhood abuse in borderline personality disorder. *Biological Psychiatry, 55*, 759-765.

Schwartz, G. E., Weinberger, D. A., & Singer, J. A. (1981). Cardiovascular differentiation of happiness, sadness, anger and fear following imagery and exercise. *Psychosomatic Medicine, 43*, 343-364.

Scher, C. D., Stein, M. B., Asmundson, G. J. G., McCreary, D. R., & Forde, D. R. (2001). The Childhood Trauma Questionnaire in a community sample: Psychometric properties and normative data. *Journal of Traumatic Stress, 14*, 843-857.

Schmidt, N., Joiner, T., & Telch, M. (1995). The Schema Questionnaire: investigation of psychometric properties and the hierarchical structure of a measure of maladaptive schemata. *Cognitive Therapy and Research, 19*, 295-321.

Schreurs, P. J. G., van de Willige, G., & Brosschot, J. F. (1993). *De Utrechtse Coping Lijst: UCL [The Utrecht Coping List]*. Lisse: Swets en Zeitlinger.

Sebold, J. (1987). Indicators of child sexual abuse in males. *Social Casework: The Journal of Contemporary Social Work, 68*, 75-80.

Segal, Z.V., Williams, J., & Teasdale, J. (2002). *Mindfulness-Based Cognitive Therapy for depression. A new approach to preventing relapse.* New York: The Guilford Press.

Segal, Z. V., Williams, J. M. G., Teasdale, J. D., & Gemar, M. (1996). A cognitive science perspective on kindling and episode sensitization in recurrent affective disorder. *Psychological Medicine, 26*, 371-380.

Serin, R. (1991). Psychopathy and violence in criminals. *Journal of Interpersonal Violence, 6*, 423-431.

Sherman, G., Haidt, J., & Coan, J. Nazis really are disgusting: Psychophysiological evidence for sociomoral disgust. *Submitted for publication.*

Shirahata, S. (1977). Tests of partial correlation in a linear model. *Biometrika, 64,* 162-164.

Simon, G. (1977). A nonparametic test of total independence based on Kendall`s tau. *Biometrika, 64*, 277-282.

Sinha, R., Lovallo, W. R., & Parsons, O. A. (1992). Cardiovascular differentiation of emotion. *Psychosomatic Medicine, 54*, 422-435.

Sinha, R., & Parsons, O. A. (1996). Multivariate response patterning of fear and anger. *Cognition and Emotion, 10*, 173-198.

Sokolov, E. N. (1963). Higher nervous functions: The orienting reflex. *Annual Review of Psychophysiology, 25*, 545-580.

Spielberger, C. D., Jacobs, G. A., Russel, S. F., & Crane, R. S. (1983). Assessment of anger: The State Trait Anger Scale. In J. Butcher & C. Spielberger (Eds.), *Advances in personality assessment* (Vol. 2, pp. 112-134). Hillsdale, NJ: Erlblaum.

Stanford, M. S., Houston, R. J., Villemarette-Pittman, N. R., & Greve, K. W. (2003). Premeditated aggression: Clinical assessment and cognitive psychophysiology. *Personality and Individual Differences, 34*, 773-781.

Stemmler, G. (1997). Selective activation of traits: Boundary conditions for the activation conditions of anger. *Personality and Individual Differences, 22*, 213-233.

Sterk, F., & Rijkeboer, M. M. (1997). *Schema-vragenlijst [Schema-Questionnaire]*. Utrecht: Ambulatorium Utrecht University.

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

Steuerwald, B. L., & Kosson, D. S. (2000). Emotional experiences of the psychopath. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide. The LEA series in personality and clinical psychology.* (pp. 111-135). Mahwah, NJ, US: Lawrence Erlbaum Associates, Publishers.

Swett, C., & Halpert, M. (1993). Reported history of physical and sexual abuse in relation to dissociation and other symptomatology in women psychiatric inpatients. *Journal of Interpersonal Violence, 8*, 545-555.

Terr, L. C. (1994). *Unchained memories: True stories of traumatic memories, lost and found.* New York: Basic Books.

Timmerman, I., Sanderman, R., Koopmans, P. C., & Emmelkamp, P. M. G. (1993). *Het meten van irrationele cognities met de Irrational Belief Inventory (IBI-50): een handleiding.* Groningen: Noordelijk Centrum voor Gezondheidsvraagstukken, NCG.

Tomarken, A. J., & Waller, N. G. (2005). Structural equation modelling: Strengths, limitations, and misconceptions. *Annual Review of Psychology, 1*, 31-65.

Trull, T.J., Sher, K.J., Minks-Brown, C., Durbin, J. & Burr, R. (2000). Borderline personality disorder and substance use disorders: a review and integration. *Clinical Psychological Review, 20*, 235–253.

van der Bossche, C. M. R., Kremers, I., Sieswerda, S. H., & Arntz, A. (1999). *Vragenlijst naar belastende gebeurtenissen* [structured childhood trauma interview]. Maastricht: Maastricht University.

van de Ploeg, H., Defares, P., & Spielberger, C. (1982). *Handleiding bij de Zelf Analyse Vragenlijst, ZAV.* Lisse: Swets & Zeitlinger.

Van de Vijver, F., & Hambleton, R. K. (1996). Translating tests: Some practical guidelines. *European Psychologists, 1*, 89-99.

van Genderen, H., & Arntz, A. (2005). *Schemagerichte cognitieve therapie [Schema-focused cognitive therapy]*. Amsterdam: Uitgeverij Nieuwezijds.

Van Goozen, S., Frijda, N., Wiegant, V., Endert, E., & Van de Poll, N. (1996). The premenstrual phase and reactions to aversive events: A study of hormonal influences on emotionality. *Psychoneuroendocrinology, 21*, 479-497.

van Groenestijn, M. A. C., Akkerhuis, G. W., Kupka, R. W., Schneider, N., & Nolen, W. A. (1999). *Gestructureerd klinisch interview voor de vaststelling van DSM-IV as-I stoornissen (SCID-I). [Structured clinical interview for DSM-IV Axis I disorders (SCID-I)]*. Lisse: Swets & Zeitlinger.

van Vreeswijk, M. F., & Broersen, J. (2006). *Schemagerichte therapie in groepen: Cognitieve groepspsychotherapie bij persoonlijkheidsstoornissen. Handleiding voor therapeuten [Schema-focused therapy in groups: Cognitive group-psychotherapy for personality disorders. Guideliness for therapists]*. Houten: Bohn Stafleu van Loghum.

van Vreeswijk, M., Broersen, J., & Schurink, G. (2006). *Schemagerichte therapie in groepen: Cognitieve groepspsychotherapie bij persoonlijkheidsstoornissen. Werkboek voor patiënten [Schema-focused therapy in groups: Cognitive group-psychotherapy for personality disorders. Workbook for patients]*. Houten: Bohn Stafleu van Loghum.

Walker, R. (1992). Substance abuse and B-cluster disorders: II. Treatment recommendations. *Journal of Psychoactive drugs, 24,* 233–241.

Wallen, J. (1992). A comparison of male and female clients in substance abuse treatment. *Journal of Substance Abuse, 9,* 243–248.

Walters, G. & Greene, R. (1983). Factor structure of the overcontrolled-hostility scale of the MMPI. *Journal of Clinical Psychology, 39*, 560–562.

Warner, M.B., Morey, L.C., Finch, J.F., Gunderson, J.G., Skodol, A.E., Sanislow, C.A., et al. (2004). The longitudinal relationship of personality traits and disorders. *Journal of Abnormal Psychology, 113,* 217-227.

Weertman, A., Arntz, A., Dreessen, L., van Velzen, C., & Vertommen, S. (2003). Short-interval test-retest inter-rater reliability of the Structured Clinical Interview for DSM-IV personality disorders (SCID II). *Journal of Personality Disorders, 17*, 562-567.

Weertman, A., Arntz, A., & Kerkhofs, M. L. M. (2000). *Gestructureerd diagnostisch interview voor DSM-IV persoonlijkheidsstoornissen (SCID II). [Structural and clincal interview for DSM-IV personality disorders (SCID II)]*. Lisse: Swets Test Publisher.

Widiger, T.A. & Corbitt, E.M. (1997). Comorbidity of antisocial personality disorder with other personality disorders. In: Stoff, D.M., Breiling, J. and Maser, J.D. Editors, *Handbook of Antisocial Behavior*, Wiley, New York.

Widiger, T.A., Frances, A. & Trull, T.J. (1987). A multidimensional scaling of the DSM-III personality disorders. *Archives of General Psychiatry, 44,* 741–745.

Widiger, T.A., Lowe, J.R. (2007). Five-factor model assessment of personality disorder. *Journal of Personality Assessment, 89,* 16-29.

Wilcox, R. R. (2005). *Introduction to Robust Estimation and hypothesis testing, second edition.* Amsterdam: Elsevier, Academic Press.

Wilson, T. D., & Dunn, E. W. (2004). Self-knowledge: its limits, value, and potential for improvement. *Annual Review of Psychology, 55*, 493-518.

Wink, P. (1991). Two faces of narcissism. *Journal of Personality and Social Psychology, 61*, 590-597.

Yen, S., Shea, M. T., Battle, C. L., Johnson, D. M., Zlotnick, C., Dolan-Sewell, R., et al. (2002). Traumatic exposure and Posttraumatic Stress Disorder in Borderline, Schizotypical, Avoidant and Obsessive-Compulsive Personality Disorders: Findings from the Collaborative Longitudinal Personality Disorders Study. *The Journal of Nervous and Mental Disease, 190*, 510-518.

Young, J. E. (1990). *Cognitive therapy for personality disorders: A schema-focused approach.* Sarasto: Professional Resource Exchange, Inc.

Young, J. E. (1998). *Young Schema Questionnaire Short Form.* New York: Cognitive Therapy Centre.

Young, J. E. (2002). Personal communication.

Young, J. E. (2005). Schema-focused cognitive therapy and the case of Ms. S. *Journal of Psychotherapy Integration, 15*, 115-126.

Young, J.E., Arntz, A., Atkinson, T., Lobbestael, J., Weishaar, M.E., van Vreeswijk, M.F., et al. (2007). *The Schema Mode Inventory.* New York: Schema Therapy Institute.

Young, J., Atkinson, T., Arntz, A., Engels, & Weishaar, M. (2005). *The Young Atkinson Mode Inventory (YAMI-PM, 1B).* New York: Schema Therapy Institute.

Young, J. E., & Klosko, J. (1994). *Reinventing your life.* New York: Plume.

Young, J. E., Klosko, J., & Weishaar, M. E. (2003). *Schema therapy: A practioner`s guide.* New York: Guilford.

Zanarini, M. C. (2000). Childhood experiences associated with the development of borderline personality disorder. *Psychiatric Clinics of North America, 23*, 89-101.

Zanarini, M. C. & Frankenburg, F.R. (2001). Attainment and maintenance of reliability of axis I and II disorders over the course of a longitudinal study. *Comprehensive Psychiatry, 42*, 369-374.

Zanarini, M. C., & Gunderson, J. G. (1997). Differental diagnoses of antisocial behavior and borderline personality disorder. In D. Stoff, J. Breiling & J. Maser (Eds.), *Handbook of antisocial behavior.* New York: John Wiley & Sons, inc.

Zanarini, M. C., Skodol, A. E., Bender, D. S., Dolan, R., Sanislow, C., Scheaefer, E., et al. (2000). The collaborative longitudinal personality disorder study: Reliability of axis I and II diagnoses. *Journal of Personality Disorders, 14*, 291-299.

Zanarini, M., Williams, A., Lewis, R., Reich, R., Vera, S., Marino, M., et al. (1997). Reported pathological childhood experiences associated with the development of borderline personality disorder. *American Journal of Psychiatry, 154*, 1101-1106.

Zubin, J., & Spring, B. (1977). Vulnerability: A new view of schizophrenia. *Journal of Abnormal Psychology, 86*, 103-126.

APPENDICES

APPENDIX 1: LISTING OF THE 22 SCHEMA MODES

1. Child modes

1.1 Vulnerability

1.1.1 Lonely Child*: Feels like a lonely child that is valued only insofar as (s)he can aggrandize his/her parents. Because the most important emotional needs of the child have generally not been met, the patient usually feels empty, alone, socially unacceptable, undeserving of love, unloved and unlovable.

1.1.2 Abandoned and Abused Child*: Feels the enormous emotional pain and fear of abandonment, which has a direct link with the abuse history. Has the affect of a lost child: sad, frightened, vulnerable, defenceless, hopeless, needy, victimized, worthless and lost. Patients appear fragile and childlike. They feel helpless and utterly alone and are obsessed with finding a parent figure who will take care of them.

1.1.2.1 Humiliated/inferior child: A sub form of the Abandoned and Abused Child mode, in which patients experience humiliation and inferiority related to childhood experiences within and outside the family.

1.1.3 Dependent Child: Feels incapable and overwhelmed by adult responsibilities. Shows strong regressive tendencies and wants to be taken care of. Related to the lack of development of autonomy and self-reliance, often caused by authoritarian upbringing.

1.2 Anger

1.2.1 Angry child*: Feels intensely angry, enraged, infuriated, frustrated or inpatient, because the core emotional (or physical) needs of the vulnerable child are not being met. They vent their suppressed anger in inappropriate ways. May make demands that seem entitled or spoiled and that alienate others.

1.2.2 Enraged Child*: Experiences intense feelings of anger that results in hurting or damaging people or objects. The displayed anger is out of control, and has the goal of destroying the aggressor, sometimes literally. Has the affect of an enraged or uncontrollable child, screaming or acting out impulsively to an (alleged) perpetrator.

1.3 Lack of discipline

1.3.1 Impulsive Child*: Acts on non-core desires or impulses from moment to moment in a selfish or uncontrolled manner to get his or her own way, without regard to possible consequences for the self or others. Often has difficulty delaying short-time gratification and may appear `spoiled`.

1.3.2 Undisciplined Child*: Cannot force him/herself to finish routine or boring tasks, gets quickly frustrated and gives up soon.

1.4 Happiness

1.4.1 Happy Child*: Feels at peace because core emotional needs are currently met. Feels loved, contented, connected, satisfied, fulfilled, protected, praised, worthwhile, nurtured, guided, understood, validated, self-confident, competent, appropriately autonomous or self-reliant, safe, resilient, strong, in control, adaptable, optimistic and spontaneous.

2. Maladaptive coping modes

2.1 Surrender

2.1.1 Compliant Surrender*: Acts in a passive, subservient, submissive, reassurance-seeking, or self-deprecating way towards others out of fear of conflict or rejection. Passively allows him/herself to be mistreated, or does not take steps to get healthy needs met. Selects people or engages in other behaviour that directly maintains the self-defeating schema-driven pattern.

2.2 Avoidance

2.2.1 Detached Protector*: Withdraws psychologically from the pain of the schemas by emotionally detaching. The patient shuts off all emotions, disconnects from others and rejects their help, and functions in an almost robotic manner. Signs and symptoms include depersonalisation, emptiness, boredom, substance abuse, bingeing, self-mutilation, psychosomatic complaints and `blankness`.

2.2.2 Detached Self-Soother*: Shut off their emotions by engaging in activities that will somehow soothe, stimulate or distract them from feeling. These behaviours are usually undertaken in an addictive or compulsive way, and can include workaholism, gambling, dangerous sports, promiscuous sex, or drugs abuse. Another group of patients compulsively engages in solitary interests that are more self-soothing than self-stimulating, such as playing computer games, overeating, watching television, or fantasizing.

2.2.3 Angry protector: Uses a `wall of anger` to protect him/herself from others who are perceived as threatening and keeps others at a safe distance through displays of anger.

2.3 Overcompensation

2.3.1 Self-Aggrandiser*: Behaves in an entitled, competitive, grandiose, abusive, or status-seeking way in order to have whatever they want. They are almost completely self-absorbed, and show little empathy for the needs or feelings of others. They demonstrate superiority and expect to be treated as special and do not believe they should have to follow the rules that apply to everyone else. They crave for admiration and frequently brag or behave in a self-aggrandizing manner to inflate their sense of self.

2.3.2 Overcontroller: Attempts to protect him/herself from a perceived or real threat by focussing attention, ruminating, and exercising extreme control. Two sub forms can be distinguished:

2.3.2.1 Perfectionistic overcontroller: Focuses on perfectionism to attain control and prevent misfortune and criticism.

2.3.2.2 Suspicious overcontroller: Focuses on vigilance, scanning other people for sings of malevolence, and controls others` behaviour out of suspiciousness.

2.3.3 Bully and Attack*: Directly harms other people in a controlled and strategic way emotionally, physically, sexually, verbally, or through antisocial or criminal acts. The motivation may be to overcompensate for prevent abuse or humiliation. Has sadistic properties.

2.3.4 Conning and manipulative mode: Cons, lies, or manipulates in a manner designed to achieve a specific goal, which either involves victimizing others or escaping punishment.

2.3.5 Predator mode: Focuses on eliminating a threat, rival, obstacle, or enemy in a cold, ruthless, and calculating manner.

2.3.6 Attention and Approval Seeker: Tries to get other people's attention and approval by extravagant, inappropriate, and exaggerated behaviour. Usually compensates for underlying loneliness.

3. Maladaptive parent modes

3.1 Punitive Parent*: This is the internalized voice of the parent, criticizing and punishing the patient. They become angry with themselves and feel that they deserve punishment for having or showing normal needs that their parents did not allow them to express. The tone of this mode is harsh, critical, and unforgiving. Sings and symptoms include self-loathing, self-criticism, self-denial, self-mutilation, suicidal fantasies, and self-destructive behaviour.

3.2 Demanding/critical Parent*: Continually pushes and pressures the child to meet excessively high standards. Feels that the `right` way to be is to be perfect or achieve at a very high level, to keep everything in order, to strive for high status, to be humble, to put other needs before one's own or to be efficient or avoid wasting time. The person feels that it is wrong to express feelings or to act spontaneously.

4. Healthy Adult mode*: This mode performs appropriate adult functions such as working, parenting, taking responsibility, and committing. Pursues pleasurable adult activities such as sex; intellectual, esthetical, and cultural interests, health maintenance, and athletic activities.

Note: * these modes are enlisted in the Schema Mode Inventory (Young, Arntz, Atkinson, Lobbestael, Weishaar, van Vreeswijk, & Klokman, 2007); the Lonely Child and the Abandoned and Abused Child modes are clustered into the Vulnerable Child mode in the SMI.

Name:……..……
Date of Birth:……...…….
Age:……
Education:……..……..…
Date: …….

APPENDIX 2: SMI (VERSION 1)

INSTRUCTION: Listed below are statements that people might use to describe themselves. Please rate each item on **how often** you have believed or felt each statement **in general** using the frequency scale.

FREQUENCY: In general	
1= Never or Almost Never	4= Frequently
2= Rarely	5= Most of the time
3= Occasionally	6= All of the time

Frequency	In general...
	1. By showing others that you are not to be trifled with, you command respect.
	2. I feel loved and accepted.
	3. I deny myself pleasure because I don't deserve it.
	4. I feel fundamentally inadequate, flawed, or defective.
	5. I have an impulse to punish myself by hurting myself (e.g., cutting myself).
	6. I feel lost.
	7. I'm hard on myself.
	8. I try very hard to please other people in order to avoid conflict, confrontation, or rejection.
	9. I can't forgive myself.
	10. I do things to make myself the center of attention.
	11. I get irritated when people don't do what I ask them to do.
	12. I have trouble controlling my impulses.
	13. If I can't reach a goal, I become easily frustrated and give up.
	14. I have violent outbursts.
	15. I act impulsively or express emotions that get me into trouble or hurt other people.

Frequency	In general...
	16. It's my fault when something bad happens.
	17. I feel content and at ease.
	18. I change myself depending on the people I'm with, so they'll like me or approve of me.
	19. I feel connected to other people.
	20. When there are problems, I try hard to solve them myself.
	21. I don't discipline myself to complete routine or boring tasks.
	22. If I don't fight, I will be abused or neglected.
	23. I have to take care of the people around me.
	24. Who allows him/herself to be made fun of, is a loser.
	25. I physically attack others when I am angry at them.
	26. Once I start to feel angry, I often don't control it and lose my temper.
	27. It's important for me to be Number One (e.g., the most popular, most successful, most wealthy, most powerful).
	28. I feel indifferent.
	29. I can solve problems rationally without letting my emotions overwhelm me.
	30. I find it nonsense to make a plan how to handle something.
	31. I will not settle for the second best.
	32. Attack is the best defence.
	33. I feel cold towards other people.
	34. I feel detached (no contact with myself, my emotions or other people).
	35. I follow my emotions blindly.
	36. I feel desperate.
	37. I allow other people to criticize me or put me down.
	38. In relationships, I let the other person have the upper hand.
	39. I feel distant from other people.
	40. I act impulsively or express emotions that get me into trouble or hurt other people.
	41. I work or sport intensively so I do not have to think about annoying feelings.
	42. I 'm angry that people are trying to take away my freedom or independence.
	43. I feel nothing.
	44. I do what I want to do, regardless of other people's needs and feelings.
	45. I'm not letting myself relax or have fun until I've finished everything I'm supposed to do.
	46. I throw things around when I am angry.
	47. I feel enraged at someone.
	48. I feel that I fit in with other people.
	49. I have a lot of anger built up inside of me that I need to let out.

Frequency	In general...
	50. I feel lonely.
	51. I try to do my best at everything I do.
	52. I like doing something exciting or soothing to avoid my feelings (e.g., working, gambling, eating, shopping, sexual activities, watching TV).
	53. Equality does not exist, so you best stand above others.
	54. In my anger, I loose control over myself and I threaten others.
	55. I let other people get their own way instead of expressing my own needs.
	56. If someone is not with me they are against me.
	57. In order to be bothered less from my annoying thoughts or feelings, I make sure that I am always busy.
	58. I'm bad if I get angry at other people.
	59. I don't want to get involved with people.
	60. I have been so angry that I have (seriously) hurt someone or killed someone.
	61. I feel that I have plenty of stability and security in my life.
	62. I know when to express my emotions and when not to.
	63. I'm angry with someone for leaving me alone or abandoning me.
	64. I don't feel connected to other people.
	65. I can not bring myself to do things that I find boring, even if I know it is for my own good.
	66. I break rules and regret that later.
	67. I feel humiliated.
	68. I trust most other people.
	69. I do, and think afterwards.
	70. I get bored easily and lose interest in things.
	71. Even if there are people around me, I feel lonely.
	72. I don't allow myself to do pleasurable things that other people do because I'm bad.
	73. I assert what I need without going overboard.
	74. I feel special and better than most other people.
	75. I don't care about anything; nothing matters to me.
	76. It makes me angry when someone tells me how I should feel or behave.
	77. If you do not rule over other people, they will rule over you.
	78. I say what I feel, or do things impulsively, without thinking of the consequences.
	79. I feel like telling people off for the way they have treated me.
	80. I'm capable of taking care of myself.
	81. I'm quite critical of other people.
	82. I'm under constant pressure to achieve and get things done.
	83. I'm trying not to make mistakes; otherwise, I'll get down on myself.

Frequency	In general...
	84. I deserve to be punished.
	85. I can learn, grow and change.
	86. I want to distract myself from upsetting thoughts and feelings.
	87. I'm angry at myself.
	88. I feel flat.
	89. I have to be the best in what I do.
	90. I sacrifice pleasure, health, or happiness to meet my own standards.
	91. I'm demanding of other people.
	92. If I am angry, it can get so out of hand that people get hurt.
	93. I am untouchable.
	94. I'm a bad person.
	95. I feel safe.
	96. I feel listened to, understood, and validated.
	97. It is impossible for me to control my impulses.
	98. I break things when I am angry.
	99. By dominating others, nothing can happen to you.
	100. I act in a passive way, even when I don't like the way things are.
	101. My anger gets out of control.
	102. I make fun of others.
	103. I feel like lashing out or hurting someone for what he/she did to me.
	104. I know that there is a 'right' and a 'wrong' way to do things; I try hard to do things the right way, or else I start criticizing myself.
	105. I often feel alone in the world.
	106. I feel weak and helpless.
	107. I'm lazy.
	108. It is wise to accept everything from people that are important for me.
	109. I've been cheated or treated unfairly.
	110. If I feel the urge to do something, I just do it.
	111. I feel left out or excluded.
	112. I belittle others.
	113. I feel optimistic.
	114. I feel I shouldn't have to follow the same rules that other people do.
	115. My life right now revolves around getting things done and doing them 'right'.
	116. I'm pushing myself to be more responsible than most other people.
	117. I can stand up for myself when I feel unfairly criticized, abused, or taken advantage of.
	118. I don't deserve sympathy when something bad happens to me.

Frequency	In general...
	119. I feel that nobody loves me.
	120. I feel that I'm basically a good person.
	121. When necessary, I complete boring and routine tasks in order to accomplish things I value.
	122. I feel spontaneous and playful.
	123. I can be so angry that I am capable of murdering someone.
	124. I have a good sense of who I am and what I need to make myself happy.

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APPENDIX 3: INTERVIEW FOR TRAUMATIC EVENTS IN CHILDHOOD

Instructions: (to be read to the participant)
"People can get affected by stressful and unsettling events. We will ask you whether you experienced such events. The questions will cover your experiences in the time period of your childhood and teenage years. Although some of the questions will be personal, we would like to ask you to answer them as truthfully as possible. Your answers will be handled with utmost confidentiality."

How to fill out this form: (only for the administrator)
This interview consists of four parts: 1) sexual abuse, 2) physical abuse, 3) emotional abuse, and 4) neglect. In each part a number of actions are described, which the participant might have been confronted with. The last question of every part is concerned with whether the participant witnessed one of the listed actions.
If the participant was directly involved in an action, all non-shaded fields must be filled out using the code indicated on page 3. If the participant witnessed one of the listed action, the complete row must be filled out. The items marked with an asterisk (*) describe actions which the participant could have witnessed.
In case a person is mentioned which is not included in the code list, the relationship the participant had with this person must be assessed. For instance, a classmate who maintains a good relationship with the participant will be classified as a friend, whereas a classmate who the participant does not have a good relationship with is coded as an acquaintance.
In case more than one perpetrator is named (for instance with emotional abuse, item 7), list all persons concerned but only code the person closest to the participant. If the father, for example, argues with the cousin and the grandmother, only code the father.

Example:

Event 13	Action (1-12)	By whom? (coded)	To whom? if 13 = yes (coded)	How old were you? (starting age, coded)	Once or more often?	If more often, for how long? (total period, coded)	Degree of distress at that time? (0-4)	Has the negative impact changed later? (0-2)
	2	6	-	1	1	2	2	0
X	2	6	4	2	0	-	3	2
X	3	6	4	3	0	-	3	2

Explanation of example:

1. Action 2 was committed by the step- / foster father. The participant was between 0 and 6 years old when it began. It happened more than once for a period of 1 to 3 years. The degree of distress at that time was considerable and has not changed later on.

2. The participant witnessed the second action, committed by the step-/ foster father to the sister. At that time the participant was between 6 and 12 years old, and it happened once. The degree of distress was severe and has later changed to "more distressful".

3. See 2, except for this time, the participant witnessed – and was not the victim of – a different action (action 3).

CODE LIST

Codes describing persons

1	Mother	8	Uncle	15	Brother-in-law	21	Partner
2	Father	9	Grand-mother	16	Sister-in-law	22	Friend
3	Brother(s)	10	Grandfather	17	Acquaintance of parents	23	Acquaintance
4	Sister(s)	11	Cousin (male)	18	Social worker	24	Stranger
5	Step-/ foster mother	12	Cousin (female)	19	Teacher	25	Several persons
6	Step-/ foster father	13	Neighbour (male)	20	Confidant (e.g. babysitter, priest, pastor)		
7	Aunt	14	Neighbour (female)				

How old were you?

1. 0-6 years
2. 6-12 years
3. 12-18 years

Did the event happen once or more often?

0. Once
1. More often

Duration of the total time period in which the stressful and unsettling event happened more often.

What was the total duration?

1. less than 1 year
2. 1-3 years
3. 4-6 years
4. 7-9 years
5. 10 years or longer

(In case the participant does not exactly know the duration, try to find out an estimate. Otherwise, take the average of the rest of the group.)

Degree of distress. (name all the options!)

To which degree did you feel distressed at that time?

0. Not at all
1. A little
2. Considerably
3. Severely
4. Very severely

Degree of distress later.

Has the degree of distress changed later on?

0. No
1. Yes, less distressful later on
2. Yes, more distressful later on

In case of sexual abuse, action 10

0. Objects designed for insertion (e.g. a vibrator)
1. Blunt objects, not designed for insertion
2. Sharp object, not designed for insertion or another type of damaging object

Before you turned 18, were you ever sexually approached against your will?

Yes - No

Before you turned 18, did you ever have a sexual relationship with someone who was at least 5 years older?

Yes - No

Even if no sexual abuse present, ask question 14 (witnessing)

If so, which actions were present? (to be filled in tab below using codes on page 3)

1. Your were approached with an offer to engage in sexual acts
2. You were sexually touched
3. You had vaginal intercourse
4. You had anal intercourse
5. You sexually satisfied someone by hand
6. You sexually satisfied someone by mouth
7. You were being "sexually satisfied" (by hand or mouth)
8. You were forced to watch sexual acts (*)
9. You were involved in sexually sadistic acts (e.g. sadomasochism or sex with animals)
10. It was made use of objects in a sexual way, namely……..(code = ...)
11. You were involved in sexual acts in which spectators were present, direct or indirect (e.g. by video recording) (*)
12. You were blackmailed to remain silent about the sexual acts
13. Other:.....
14. Did you witness one of the actions above? If so, we would like to know **which actions**, **by whom**, and **to whom** they were committed. (again go through questions above)

Event 14	Action (1-13)	By whom? (coded)	To whom? if 14 = yes (coded)	How old were you? (starting age, coded)	Once or more often?	If more often, for how long? (total period, coded)	Degree of distress at that time? (0-4)	Has the negative impact changed later? (0-2)

Before you turned 18, did you ever experience one of the following events?

1. You were hit
2. You were kicked
3. You were punched
4. You were hit with a stick or another object
5. You were being thrown at with something
6. Your hair was pulled
7. You were cut with a knife or another sharp object
8. You were burned by someone
9. You were taken by the throat
10. Your clothes were ripped off your body
11. You were dragged along the ground
12. You were tied up or locked in
13. You were threatened with one of the actions just mentioned
14. Other:.....
15. Did you witness one of the actions above? If so, we would like to know **which actions**, **by whom**, and **to whom** they were committed. (again go through questions above)

Event 15	Action (1-14)	By whom? (coded)	To whom? if 15 = yes (coded)	How old were you? (starting age, coded)	Once or more often?	If more often, for how long? (total period, coded)	Degree of distress at that time? (0-4)	Has the negative impact changed later? (0-2)

Before you turned 18, did you ever experience one of the following events?
(this concerns emotional abuse, i.e. active)

1. Something you liked was destroyed
2. You were not allowed to express your feelings or needs, or you were punished when you did
3. You were nagged, humiliated, or called names
4. Your were verbally threatened
5. You were punished in an unfair or cruel way (attention: code physical punishment in the physical abuse section)
6. Hurtful or insulting words were used
7. There were frequent arguments between other family members (*)
8. In the family there were frequent problems with the police (*)
9. You had to protect yourself against family members by hiding or walking away
10. Other:.....
11. Did you witness one of the actions above? If so, we would like to know **which actions**, **by whom**, and **to whom** they were committed. (again go through questions above)

Event 11	Action (1-10)	By whom? (coded)	To whom? if 11 = yes (coded)	How old were you? (starting age, coded)	Once or more often?	If more often, for how long? (total period, coded)	Degree of distress at that time? (0-4)	Has the negative impact changed later? (0-2)

Before you turned 18, did you ever experience one of the following events?
(this concerns emotional and physical neglect, i.e. rather passive)

1. You had to take care of your parents or other children in the family
2. Your parents were addicted to alcohol or drugs (*)
3. You were left alone a lot (*)
4. You were left to your own devices (*)
5. Your received no warmth or love
6. You had too little to eat
7. You had to wear dirty and/ or dirty clothes
8. There were no clear rules or responsibilities at home (*)
9. There was no one in your family to defend you
10. Other:…….
11. Did you witness one of the actions above? If so, we would like to know **which actions**, **by whom**, and **to whom** they were committed. (again go through questions above)

Event 11	Action (1-10)	By whom? (coded)	To whom? if 11 = yes (coded)	How old were you? (starting age, coded)	Once or more often?	If more often, for how long? (total period, coded)	Degree of distress at that time? (0-4)	Has the negative impact changed later? (0-2)

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About the author

Jill Lobbestael was born on 11 June, 1980, in Bilzen, Belgium. In 1998 she graduated from secondary school, specialization Mathematics-Science. In that year, she started studying Health Science at Maastricht University. In 2002 she graduated in Mental Health Science. The next year, she worked in the Community Mental Health Centre (RIAGG) Maastricht as a research assistant. During that time, she wrote her PhD proposal that was granted by the Maastricht University Research Institute of Experimental Psychopathology in 2003. From February 2008, she is appointed assistant professor at Maastricht University, Department of Clinical Psychological Science. She also works as a therapist at the RIAGG Maastricht, in the team for anxiety disorders.

List of publications

Lobbestael, J. Validering van de Schema Mode Inventory. In M. Van Vreeswijk, J. Broersen, J & M. Nadort (Eds). Handboek voor schematherapie: Theorie, praktijk en onderzoek. Houten: Bohn Stafleu van Loghum. In press.

Lobbestael, J., Arntz, A., Harkema-Schouten, P., & Bernstein, D. (2008). Development and psychometric evaluation of a new assessment method for childhood trauma: the Interview for Traumatic Events in Childhood (ITEC). *Child Abuse and Neglect.* Accepted pending revision.

Lobbestael, J., Arntz, A., & Sieswerda, S. (2005). Schema modes and childhood abuse in borderline and antisocial personality disorder. *Journal of Behavior Therapy and Experimental Psychiatry,* 36, 240-253.

Lobbestael, J., Arntz, A., & Wiers, R.W. (2008). How to push someone's buttons: A comparison of four anger induction methods. *Cognition and Emotion,* 22, 353-373.

Lobbestael, J. & Sieswerda, S. Experimentele studies naar schema`s en schemamodi. In M. Van Vreeswijk, J. Broersen, J & M. Nadort (Eds). *Handboek voor schematherapie: Theorie, praktijk en onderzoek.* Houten: Bohn Stafleu van Loghum. *In press.*

Lobbestael, J., van Vreeswijk, M., & Arntz, A. (2007). Shedding light on schema modes: A clarification of the mode concept and its current research status. *Netherlands Journal of Psychology,* 63, 76-85.

Lobbestael, J., van Vreeswijk, M., & Arntz, A. *(in press).* An empirical test of schema mode conceptualizations in personality disorders. *Behaviour Research and Therapy.*

Cima, M., Tonnaer, F., & Lobbestael, J. (2007). Moral emotion in reactive and proactive offenders using implicit measures. *Netherlands Journal of Psychology,* 63, 144-155.

Submitted manuscripts

Lobbestael, J. & Arntz, A. Emotional, cognitive and physiological correlates of abuse-related stress in borderline and antisocial personality disorder.

Lobbestael, J., Arntz, A., & Bernstein, D. Disentangling the relationship between different types of childhood trauma and personality disorders.

Lobbestael, J., Arntz, A., Cima, M., & Chakhssi, F. Effects of induced anger in patients with antisocial personality disorder.

Lobbestael, J., Arntz, A., Löbbes, A., & Cima, M. Antisocial patients underreport the presence of their maladaptive schema modes as compared to their therapists.

Lobbestael, J., van Vreeswijk, M., Spinhoven, P., Schouten, E., & Arntz, A. Reliability and validity of the Dutch version of the Schema Mode Inventory (SMI).

Developed instruments

Lobbestael, J., Arntz, A., Kremers, I., & Sieswerda, S. (2006). *The Interview for Traumatic Events in Childhood (ITEC).* Maastricht: Maastricht University.

Young, J.E., Arntz, A., Atkinson, T., Lobbestael, J., Weishaar, M.E., van Vreeswijk, M.F., & Klokman, J. (2007). *The Schema Mode Inventory (SMI).* New York: Schema Therapy Institute.