

## **Are Early Maladaptive Schemas Related to Borderline Personality Disorder Symptomatology Among Depressed Adult Inpatients?**

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Tiivistelmä - Referat - Abstract  <p><b>Objective:</b> Major Depressive Disorder (MDD) and Borderline Personality Disorder (BPD) are serious psychiatric disorders highly prevalent in clinical settings, characterized by multiple forms of distress, functional decline, and increased risk of suicide. MDD and BPD often co-occur and the co-occurrence of the disorders is associated with the course of MDD. Early Maladaptive Schemas (EMSs) refer to maladaptive internalized representations of the self in relation to others that develop early in life. EMSs are associated with depressive and BPD symptomatology and symptom severity. However, the associations between EMSs and psychiatric comorbidity have rarely been studied. The aim of the present study was to provide new insight into the comorbidity of BPD and MDD by focusing on the associations between EMSs and BPD symptomatology among depressed inpatient population.</p> <p><b>Methods:</b> The sample consisted of 43 adult inpatients (29 women and 14 men). BPD symptomatology was measured via Structured Clinical Interview for DSM-III-R Personality Disorders and EMSs via Young Schema Questionnaire-S2-Extended self-report questionnaires. A three-level linear regression model was created to predict self-reported BPD symptomatology: In level 1, linear regression analysis was conducted for each individual EMS separately, EMSs entered as predictors for BPD symptomatology. In level 2, gender, age, education level and employment status were added to the model as covariates. In level 3, also current level of depressive symptoms measured via Center for Epidemiological Studies Depression Scale was added to the model as a covariate.</p> <p><b>Results and conclusions:</b> Higher scores on 10 of the 18 EMSs were significantly positively associated with elevated self-reported BPD symptomatology. However, only one EMS, Unrelenting Standards and Hypercriticalness, was independently positively associated with self-reported BPD symptomatology and explained variance over the effect of current depressive symptom state, gender, age, education level and employment status. According to the findings of the present study, Unrelenting Standards and Hypercriticalness may act a specific cognitive risk factor for elevated BPD symptomatology and symptom severity among depressed individuals.</p>			
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Tiivistelmä – Referat – Abstract <p><b>Tutkimuksen tarkoitus:</b> Masennus ja epävakaa persoonallisuushäiriö ovat hoidon piirissä yleisiä psykiatrisia häiriöitä, joita luonnehtii monimuotoinen kärsimys ja toimintakyvyn lasku, sekä kohonnut riski itsemurhaan. Masennus ja epävakaa persoonallisuushäiriö esiintyvät usein yhdessä ja häiriöiden yhteisesiintyvyys on yhteydessä masennuksen kulkuun. Varhaiset maladaptiiviset skeemat puolestaan viittaavat varhain elämässä sisäistyneisiin itseä ja muita koskeviin merkitsevästi haitallisiin tulkintatapoihin. Skeemat ovat yhteydessä sekä masennuksen että epävakaan persoonallisuushäiriön oireisiin ja oireiden vakavuusasteeseen, mutta skeemojen yhteyttä psykiatriseen yhteisesiintyvyyteen on kaikesta huolimatta tutkittu vain vähän. Tämän tutkimuksen tarkoituksena oli perehtyä epävakaan persoonallisuushäiriön ja masennuksen väliseen yhteisesiintyvyyteen tarkastelemalla skeemojen yhteyttä epävakaan persoonallisuushäiriön oireisiin osastohoitoa vaativassa masentuneessa potilasväestössä.</p> <p><b>Menetelmät:</b> Otos koostui 43:sta aikuisesta osastohoitoa vaativasta potilaasta (29 naista ja 14 miestä). Epävakaan persoonallisuushäiriön oireita kartoitettiin Structured Clinical Interview for DSM-III-R Personality Disorders ja skeemoja Young Schema Questionnaire-S2-extended itsearviointikyselyjen avulla. Itsearvioituja epävakaan persoonallisuushäiriön oireita ennustettiin kolmiosaisen lineaarisen regressiomallin avulla: Ensimmäisessä vaiheessa epävakaan persoonallisuushäiriön oireet lisättiin malliin riippuvaksi muuttujaksi ja skeemat riippumattomiksi muuttujiksi ja lineaarinen regressioanalyysi suoritettiin jokaiselle skeemalle erikseen. Seuraavaksi sukupuoli, ikä, koulutustaso ja työllisyysstatus lisättiin malliin kovariaateiksi. Kolmannessa vaiheessa malliin lisättiin kovariaatiksi myös Center for Epidemiological Studies Depression Scale itsearviointikyselyn avulla mitattu tutkimuksen aikainen masennusoireilu.</p> <p><b>Tutkimustulokset ja johtopäätökset:</b> Kymmenen kahdeksastatoista maladaptiivisesta skeemasta oli merkitsevästi positiivisessa yhteydessä lisääntyneisiin itsearvioituihin epävakaan persoonallisuushäiriön oireisiin. Kuitenkin vain yksi skeema, Ylikriittisyys ja Vaativuus, oli itsenäisessä positiivisessa yhteydessä epävakaan persoonallisuushäiriön oireisiin ja selitti vaihtelua epävakaan persoonallisuushäiriön oireissa yli tutkimuksen aikaisten masennusoireiden, sukupuolen, iän, koulutustason ja työllisyysstatuksen vaikutuksen. Tämän tutkimuksen perusteella Ylikriittisyys ja Vaativuus voi toimia spesifinä kognitiivisena riskitekijänä epävakaan persoonallisuushäiriön oireiden ja niiden vakavuusasteen kasvuun masentuneessa väestössä.</p>			
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## **Foreword**

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## 1. Introduction

In the clinical field, the comorbidity of psychiatric disorders poses a well-recognized challenge for treatment planning and for the prognosis of treatment. Several patients arriving to psychiatric ward with an acute symptom state demanding hospitalization also fulfill the criteria for comorbid personality disorder (Zanarini et al., 1998), significantly complicating the treatment (Reich & Green 1991). Hence, early identification of an increased risk for comorbid personality disorder is important in terms of effective treatment planning, and is the main focus of the present study.

Major Depressive Disorder (MDD) is a mood disorder characterized by complex patterns of remission, relapse and recovery (APA 2013; Grilo, et al., 2005). MDD is a serious and refractory public health problem due to its relatively high prevalence in general and clinical population (Bromet et al., 2011; Hasin, Goodwin, Stinson & Grant 2005; Kessler et al., 2003; Kringlen, Torgersen & Cramer 2001; Lindeman et al., 2000; Pirkola et al., 2005; Rubio et al., 2011), impact on individual's functional capability (Ciechanowski, Katon & Russo 2000; Katon 2003; Katon & Ciechanowski 2002; Penninx et al., 1999) and markedly heightened risk of suicide (Angst, Angst & Stassen 1999; Hasin et al., 2005). World Health Organization (WHO) now ranks MDD as one of the most burdensome diseases in the world, and projects that by 2020 it will be the second leading cause of disability (Bromet et al., 2011; Hasin et al., 2005; Kessler et al., 2003).

Borderline personality disorder (BPD) is a chronic and debilitating psychiatric problem, characterized by a pattern of chaotic and self-defeating interpersonal relationships, emotional lability, poor impulse control, angry outbursts, self-mutilation, chronic suicidal tendencies and high risk of suicide (APA 2013; Black, Blum, Pfohl, & Hale 2004; Gutheil 2004; Lieb, Zanarini, Schmal, Linehan & Bohus 2004; Paris 2004; Paris 2005; Pompili, Girardi, Ruberto & Tatarelli 2005; Sansone 2004). BPD is highly prevalent in clinical settings (Zanarini et al., 1998; Zimmerman, Rothschild & Chelminski 2005) and it is characterized by more enduring symptomatic remissions but more severe functional impairment than many other psychiatric disorders (Ansell, Sanislow, McGlashan & Grilo 2007; Arens et al., 2013; Bornovalova, Hicks, Iacono & McGue 2009; Cohen, Crawford, Johnson & Kasen 2005; Crawford, Cohen, Chen, Anglin & Ehrensaft 2009; Frankenburg & Zanarini 2004; Goodman et al., 2010; Gunderson et al., 2011; Lieb, Zanarini, Schmal,

Linehan & Bohus 2004; Skodol, Gunderson, Pfohl, Widiger, Livesley, & Siever 2002; Zanarini et al., 2007; Zanarini et al., 2010). BPD is associated with substantial treatment utilization (Ansell, et al., 2007; Asselt, Dirksen, Arntz & Severens 2007; Frankenburg & Zanarini 2004; Zanarini, Frankenburg, Hennen, & Silk 2004), BPD patients require more mental-health care resources than do individuals with other psychiatric conditions (Ansell et al., 2007; Lieb et al., 2004), resulting in high overall societal costs of BPD (Ansell et al., 2007; Asselt et al., 2007).

MDD and BPD often co-occur (Grilo et al., 2005; Skodol et al., 2002; Skodol et al., 1999; Zanarini et al., 1998; Zimmerman et al., 2005). A co-occurring personality disorder is associated with the clinical form of expression, longer duration, and an elevated risk of relapse and recurrence of MDD (Grilo et al., 2005; Lönnqvist et al., 2008; Melartin, Rytsälä, Leskelä, Lestelä-Mielonen, Sokero & Isometsä 2004; Pirkola et al., 2005), as well as increased risk of suicide (Black et al., 2004; Soloff, Lynch, Kelly, Malone, & Mann 2000). The recovery of an MDD patient has been shown to slow down if an individual fulfills the criteria for comorbid personality disorder (Grilo et al., 2005; Lönnqvist et al., 2008; Melartin et al., 2004; Pirkola et al., 2005; Reich & Green 1991). Therefore, assessing and identifying comorbid BPD in patient population with MDD is important in light of effective treatment planning and targeting.

Young (1990, 1994, 1999) and Young, Klosko and Weishaar (2003) developed the construct of Early Maladaptive Schemas (EMSs) to describe the maladaptive representations of the self and others that are based on internalized early developmental experiences of unmet basic emotional needs. Originally Young (1990) hypothesized 16 primary EMSs, later 15 primary EMSs (Young 1994), and finally 18 primary EMSs (Young et al., 2003), which can be seen as a core of an individual's self-concept, guiding all information processing regarding the self in relation to others and the environment (Young 1990, 1994; Young et al., 2003). These representations originally developed as adaptations to the childhood environment, may sometimes overgeneralize ineffectively to situations later in life, being dysfunctional to a significant degree and potentially resulting in maladaptive behaviors commonly found in psychiatric disorders like MDD and BPD. Therefore assessing EMSs has an important clinical relevance; EMSs may act as predisposing factors for the development and the maintenance of clinical symptom states, and may explain various types of interpersonal and personality related problems later in life (Wang, Halvorsen, Eisemann & Waterloo 2010).

EMSs are widely used to characterize cognitive vulnerabilities for later psychopathology (Halvorsen et al., 2010; Wang et al., 2010; Rijkeboer, Van den Bergh & Van den Bout 2005), such as personality disorders (Jovev & Jackson 2004; Lawrence, Allen & Chanen 2011; Nilsson, Jorgenssen, Straarup & Licht 2010; Nordahl, Holthe & Haugum 2005; Petrocelli et al., 2001; Reeves & Taylor 2007; Schmidt et al., 1995; Specht, Chapman & Cellucci 2009) and depression (Calvete et al., 2005; Halvorsen et al., 2009; Halvorsen, Wang, Eisemann & Waterloo 2010; Harris & Curtin 2002; Hoffart et al., 2005; Petrocelli, et al., 2001; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; Thimm 2010; Van Vlierberghe et al., 2010; Wellburn et al., 2002). However, research focused on the associations between EMSs and BPD explicitly, is still quite sparse and inconsistent, compared with research related to the associations between EMSs and depression.

Putting together, if a comorbid BPD with MDD is not treated, patients will potentially respond less well to the treatment for depression than do patients with no personality disorder, which stresses the importance of assessing comorbid personality pathology in a depressed population. Investigation of psychiatric comorbidity is important in clinical practice and should therefore have a greater impact on treatment planning and targeting and on the treatment process itself, and also in developing new diagnostic classifications and treatment strategies. Even if the phenomena of the comorbidity between MDD and BPD is well-known in clinical practice (Grilo et al., 2005; Skodol et al., 1999; Zanarini et al., 1998; Zimmerman et al., 2005) and the construct of EMSs widely accepted in the field of research (Calvete et al., 2005; Halvorsen et al., 2009; Halvorsen, Wang, Eisemann & Waterloo 2010; Harris & Curtin 2002; Hoffart et al., 2005; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson, Jorgenssen, Straarup & Licht 2010; Nordahl et al., 2005; Petrocelli et al., 2001; Reeves & Taylor 2007; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; Specht et al., 2009; Van Vlierberghe et al., 2010; Wellburn et al., 2002), to the best of my knowledge, the associations between EMSs and BPD pathology are rarely studied among currently depressed individuals to date. In the present study, we focus on the associations between EMSs and BPD symptomatology and symptom severity among currently depressed inpatients.



## 1.1 MDD

MDD is a mood disorder characterized by discrete episodes of at least two weeks duration involving changes in affect, cognition and functional capability, and inter-episode remissions (American Psychiatric Association (APA), 2013). The essential features of MDD are depressed mood and the loss of interest or pleasure in nearly all activities (APA 2013). In addition, to receive an MDD diagnosis, an individual must experience at least four additional MDD symptoms characterized by changes in appetite or weight, sleep, psychomotor activity or cognition, symptoms must persist for most of the day, nearly every day, be either newly present or have clearly worsened compared with the previous status (APA 2013). The depressive episode must be accompanied by clinically significant distress or impairment in social, occupational or other important areas of functioning (APA 2013). Diagnostic criteria for MDD of the Fifth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) are presented below in Table 1. The clinical picture of MDD varies and it can be divided in to mild, moderate or severe based on the severity and the quality of the symptoms (APA 2013; Lönnqvist, Heikkinen, Henriksson, Marttunen & Partonen 2008).

Table 1.

*Diagnostic Criteria for DSM-5 MDD (APA 2013)*

---

- A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood.)
  2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).
  3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of the body weight in a month), or a decrease or increase in appetite nearly every day.  
(Note: In children, consider a failure to make expected weight gain.)
  4. Insomnia or hypersomnia nearly every day.
  5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).
  6. Fatigue or loss of energy nearly every day.
  7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).
  8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
  9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.
- B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of life.
- C. The episode is not attributable to the physiological effects of a substance or another medical condition.

Note: Criteria A-C represent a major depressive episode.

Note: Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive episode. Although the symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgement based on the individual's history and the cultural norms for the expression of distress in the context of loss.

- D. The occurrence of major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.
- E. There has never been a manic episode or a hypomanic episode.

Note: This exclusion does not apply in all of the manic-like or hypomanic-like episodes are substance-induced or are attributable to the physiological effects of another medical condition.

---

### *1.1.1 Epidemiology of MDD*

MDD is highly prevalent in the general population, and its estimated lifetime prevalence varies between 10.1-17.8% (Bromet et al., 2011; Hasin et al., 2005; Kessler et al., 2003; Kringlen et al., 2001; Rubio et al., 2011). The estimated 12-month prevalence of MDD in Finnish general population varies in between of 4.9-9.3% (Lindeman et al., 2000; Pirkola et al., 2005), and studies in other European and North American populations have shown that the 12-month MDD prevalence is between 3.2-7.3% (Bromet et al., 2011; Hasin, Goodwin, Stinson & Grant 2005; Kessler et al., 2003; Kessler et al., 2010; Kringlen et al., 2001; Rubio et al., 2011).

MDD prevalence is significantly higher among women than men (Bromet et al., 2011; Hasin et al., 2005; Kessler et al., 2003; Kringlen et al., 2001; Lindeman et al., 2000; Pirkola et al., 2004; Penninx, Leveille, Ferrucci, van Eijk & Guralnik 1999). Of other sociodemographic factors, among others, being separated (Bromet et al., 2011; Hasin et al., 2005; Kessler et al., 2003; Lindeman et al., 2000; Pirkola et al., 2004), middle-aged (Hasin et al., 2005; Lindeman et al., 2000; Pirkola et al., 2004), unemployed (Kessler et al., 2003; Lindeman et al., 2000; Pirkola et al., 2004) and from the urban areas (Lindeman et al., 2000) are associated with an elevated risk of depression, but the results related to education level are inconsistent (Bromet et al., 2011; Hasin et al., 2005; Kessler et al., 2003; Lindeman et al., 2000; Pirkola et al., 2004; Penninx et al., 1999).

### *1.1.2 Health Impact of MDD*

Depressive symptomatology is associated with increased risk for several physical conditions such as obesity (de Wit, Luppino, van Straten, Penninx, Zitman & Cuijpers 2010; Goodman & Whitaker 2002), cardiovascular diseases (Kessler et al., 2010; Thomas, Kalaria & O'Brien 2004), and respiratory- and pain conditions (Kessler et al., 2010). On the other hand, also suffering from chronic medical conditions is related to an elevated risk of depression (Lindeman et al., 2000; Pirkola et al., 2004). MDD is associated with mental and physical functional impairment (Ciechanowski et al., 2000; Katon 2003; Katon & Ciechanowski 2002; Penninx et al., 1999), poor health-related choices and poor treatment adherence of a

physical condition such as diabetes (Ciechanowski et al., 2000; Goodman & Whitaker 2002; Katon 2003; Katon & Ciechanowski 2002).

The number of prior major depressive episodes, longer duration of major depressive episode before treatment and achieving only partial remission from the index episode are associated with an elevated risk of relapse and recurrence of MDD (APA 2013; Melartin et al., 2004). Severity of depression and current comorbidity with other psychiatric disorders are robust predictors of major depressive episode duration, chronicity and recurrence (Melartin et al., 2004; Pirkola et al., 2004). A comorbid personality disorder with MDD is associated with a longer duration of depression (Melartin et al., 2004), and is about twice as likely to be associated with a poor treatment outcome (Newton-Howes, Tyrer & Johnson 2006), underlining the importance of early identification of the comorbidity.

## 1.2 Personality Disorders

Personality disorders are generally defined as an enduring pattern of inner experience and behavior that markedly deviates from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to serious distress or impairment (APA 2013). Personality disorders can be considered as maladaptive collections of traits that impair individuals and interfere with their ability to function productively (APA 2013). The general diagnostic criteria for DSM-5 personality disorders are presented below in Table 2.

Table 2.

*Diagnostic criteria for DSM-5 General Personality Disorder (APA 2013)*

---

- A. An enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture. This pattern is manifested in two (or more) of the following areas:
    - 1. Cognition (i.e., ways of perceiving and interpreting self, other people, and events).
    - 2. Affectivity (i.e., the range, intensity, lability, and appropriateness of emotional response).
    - 3. Interpersonal functioning
    - 4. Impulse control
  - B. The enduring pattern is inflexible and pervasive across a broad range of personal and social situations.
  - C. The enduring pattern leads to clinically significant distress or impairment in social, occupational, or other important areas of functioning.
  - D. The pattern is stable and of long duration, and its onset can be traced back at least to adolescence or early adulthood.
  - E. The enduring pattern is not better explained as a manifestation or consequence of another mental disorder.
  - F. The enduring pattern is not attributable to the physiological effects of a substance (e.g., a drug abuse, a medication) or another medical condition (e.g., head trauma).
- 

The distinction between general personality dysfunctioning and specific personality traits is an important focus of attention in the current diagnostics of personality disorders (Berghuis, Kamphuis & Verheul 2012; Hopwood, et al., 2011; Morey, Berghuis, Bender, Verheul, Krueger & Skodol 2011; Widiger & Samuel 2005). A general personality disorder factor including impairments in personality, characteristic for several personality disorders has gained support (Berghuis et al., 2012; Scott et al., 2013), underpinning the current two-step evaluation of personality disorders first in general and then more specifically.

The current categorical diagnostic system is also criticized by its conceptually and empirically problematic nature (Sater, Samuels, Bienvenu & Nedstadt 2001; Skodol & Bender 2009; Trull, Distel, & Carpenter 2011; Widiger 2011; Widiger & Samuel 2005; Zimmermann 2011). The heterogeneity among patients receiving the same diagnosis, large co-occurrence between the diagnoses, and arbitrary diagnostic thresholds for the boundaries between normal and pathological personality functioning are some of the criticized limitations of the categorical approach (Skodol & Bender 2009; Trull et al., 2011; Widiger 2011; Widiger & Samuel 2005; Zimmermann 2011), while a dimensional conceptualization of personality disorders is largely supported in the field of research (Bender, Moran & Skodol 2011; Hopwood et al., 2011; Krueger et al., 2011; Morey et al., 2011; Skodol &

Bender 2009; Trull et al., 2011; Widiger 2011; Zimmermann 2011). To meet the expectations of clinical relevance and utility, it is suggested that personality disorder assessment should be expanded with the individual's own conceptions of the self and others in addition to other characteristics related to personality disorders (Clarkin & Huprich 2011).

On that account, in the present study we focus on the individual's own perceptions of the self in relation to others and of personality disorder symptomatology instead of any distinct categories.

### 1.3 BPD

BPD is a complex and serious psychiatric disorder characterized by pervasive instability in emotion regulation, self-image, interpersonal relationships and impulse control that begins by early adulthood and is present in a variety of contexts (APA 2013). Diagnostic criteria for DSM-5 BPD are presented below in Table 3.

Table 3.

#### *Diagnostic Criteria for DSM-5 BPD (APA 2013)*

---

A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity, beginning by 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 behavior 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 or self-mutilating behavior covered in Criterion 5).
  5. Recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior.
  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.
-

The clinical signs of the disorder include disturbed attachment characteristics, emotional and interpersonal dysregulation, impulsive aggression, repeated self-injury, chronic suicidal tendencies and significantly elevated risk of suicide (Agrawal, Gunderson, Holmes & Lyons-Ruth 2004; APA 2013; Baird, Veague & Rabbitt 2005; Black et al., 2004; Crowell, Beauchaine & Linehan 2009; Fossati, Borroni, Feeney & Maffei 2012; Gutheil 2004; Levy 2005; Lieb et al., 2004; Minzenberg, Poole & Vinogradov 2006; Paris 2004; Paris 2005; Sansone 2004; Scott et al., 2013; Skodol et al., 2002). Emotional dysregulation reflects the reactivity of mood that is characterized by a broad range of intense negative affects and is experienced as moving rapidly from one interpersonally reactive mood state to another (APA 2013; Crowell et al., 2009; Lieb et al., 2004; Scott et al., 2013). Identity disturbance is characterized by unstable sense of self based on a series of false beliefs and maladaptive cognitive content (APA 2013; Fossati et al., 2012; Geiger, Peters, Sauer-Zavala & Baer 2013; Lieb et al., 2004). From maladaptive cognitive processes, especially anger rumination and thought suppression are associated with BPD symptomatology (Geiger et al., 2013). Impulsivity may appear either in potentially self-damaging or aforethought self-destructive forms (APA 2013; Crowell et al., 2009; Lieb et al., 2004), and intense and unstable relationships are often characterized by insecure attachment and profound fear of abandonment, manifesting itself in variety of dysfunctional strategies that tend to lead to interpersonal chaos and dissatisfaction (Agrawal et al., 2004; APA 2013; Crowell et al., 2009; Fossati et al., 2012; Lieb et al., 2004; Minzenberg et al., 2006; Scott et al., 2013).

### *1.3.1 Epidemiology of BPD*

The estimated population prevalence of current BPD is 0.7-0.8% in the European population (Arens et al., 2013; Coid, Yang, Tyrer, Roberts & Ullrich 2006; Torgersen, Kringlen & Cramer 2001) and 0.5-1.4% in the US population (Lenzenweger, Lane, Loranger & Kessler 2007; Samuels, Eaton, Bienvenu, Brown, Costa & Nedstadt 2002), and the estimated lifetime prevalence of BPD is 5.9% in the US population (Grant et al., 2008). Compared with the general population, BPD is highly prevalent in clinical settings (Coid et al., 2006; Grant et al., 2008; Lenzenweger et al., 2007; Skodol et al., 1999; Tadic et al., 2009; Torgersen et al., 2001; Zanarini et al., 1998; Zimmerman et al., 2005).

There are no sex differences in the current or lifetime BPD prevalence in general population (Arens et al., 2013; Coid et al., 2006; Grant et al., 2008; Lenzenweger et al., 2007; Torgersen et al., 2001), but women are overrepresented in clinical populations (Skodol et al., 1999; Tadic et al., 2009; Zanarini et al., 1998; Zimmerman et al., 2005). Of other sociodemographic factors, the occurrence of BPD seems to be inversely related to age and education (Arens et al., 2013; Coid 2003; Coid et al., 2006; Grant et al., 2008; Gunderson et al., 2011; Lenzenweger et al., 2007; Samuels et al., 2002). BPD is more prevalent among individuals with lower socioeconomic status and among those who are unemployed (Coid 2003; Coid et al., 2006; Grant et al., 2008; Lenzenweger et al., 2007; Torgersen et al., 2001), among those living in urban areas (Coid 2003; Torgersen et al., 2001) and among those who are single (Coid 2003; Coid et al., 2006; Grant et al., 2008; Torgersen et al., 2001).

### *1.3.2 The Developmental Antecedents of BPD*

BPD is often associated with childhood affective symptomatology joined by later interpersonal difficulties, and adolescent impulsive and hostile behavior towards the self or the others (Crowell et al., 2009; Fonagy & Bateman 2008; Goodman et al., 2010; Kobak, Zajac & Smith 2009; Reich & Zanarini 2001). According to the elaborated interpretation of Linehan's theory of BPD development (Crowell et al., 2009), "...it begins with early vulnerability, expressed initially as impulsivity and followed by heightened emotional sensitivity. These vulnerabilities are potentiated across development by environmental risk factors that give rise to more extreme emotional, behavioral, and cognitive dysregulation".

In addition to individual's internal vulnerabilities (Baird, et al., 2005, Crowell, et al., 2009), there are several environmental developmental antecedents of BPD symptomatology. One of the generally recognized antecedents is a history of traumatic experiences (Liotti & Pasquini 2000), such as early separation from the parents (Bandelow, Krause, Wedekind, Broocks, Hajak & Ruther 2005; Crawford et al., 2009), childhood abuse or neglect (Arntz, Dietzel & Dreessen 1999; Bandelow et al., 2005; Bradley, Jenei & Westen 2005; Cohen et al., 2005; Helgeland & Torgersen 2004; Minzenberg et al., 2006; Weaver & Clum 1993) and witnessed violence (Weaver & Clum 1993). Maladaptive family environment and its inconsistency, such as low socio-economic status of the parent (Crawford et al., 2009), unfavorable parental attitudes and dissatisfaction to the child, or unfavorable rearing styles



(Bandelow et al., 2005; Bradley et al., 2005; Crawford et al., 2009; Cohen et al., 2005; Helgeland & Torgersen 2004; Levy 2005) have also shown to be associated with BPD development. Parental psychopathology (Bandelow et al., 2005; Bradley et al., 2005) and parental mourning processes (Liotti & Pasquini 2000) have been shown to be associated with offspring BPD symptomatology, and parental psychopathology has been shown to be related to offspring BPD symptomatology even over and beyond its effect on family environment (Bradley et al., 2005).

### *1.3.3 Health Impact of BPD*

BPD is associated with increased risk of suicide (Black et al., 2004; Pompili et al., 2005) and several chronic physical conditions such as hypertension, diabetes, obesity, gastrointestinal diseases, and hepatic diseases (Frankenburg & Zanarini 2004; El-Gabalawy, Katz & Sareen 2010; McCloughen, Foster, Huws-Thomas, & Delgado 2012). BPD is also associated with a higher risk for cardiovascular diseases (El-Gabalawy et al., 2010; McCloughen et al., 2012; Moran et al., 2007) and poor health-related choices such as heavy smoking or alcohol and substance use and risk-taking behavior related to substance use (Darke, Ross, Williamson, Mills, Havard & Teesson 2007; Darke, Ross, Williamson, Mills & Teesson 2005; Frankenburg & Zanarini 2004). The comorbidity of chronic physical conditions and BPD is associated with a higher likelihood for poor quality of life and further increased risk for suicide attempts compared with BPD patients with no comorbid physical conditions (El-Gabalawy et al., 2010; McCloughen et al., 2012).

There is considerable variability in the course of BPD (Arens et al., 2013; Grilo, McGlashan & Skodol 2000; Grilo et al., 2007; Gunderson et al., 2011; McGlashan et al., 2005; Zanarini, Frankenburg, Reich & Fitzmaurice 2010; Skodol, Siever, Livesley, Gunderson, Pfohl & Widiger 2002; Zanarini, Frankenburg, Reich, Silk, Hudson & McSweeney 2007). BPD is associated with worsened global functioning ability over time and the longitudinal outcome of patients with BPD demonstrates a distinctive, clinically useful and diagnostically validating course, characterized by more enduring symptomatic decrease and remissions, but more severe functional impairment than in many other psychiatric disorders (Ansell et al., 2007; Arens et al., 2013; Bornovalova et al., 2009; Cohen et al., 2005; Crawford et al.,

2009; Goodman et al., 2010; Gunderson et al., 2011; Skodol et al., 2002; Zanarini et al., 2007; Zanarini et al., 2010).

BPD is associated with the high use of costly forms of health care services, such as emergency care and hospitalization (Frankenburg & Zanarini 2004), although the use of the costly forms declines over time (Zanarini, Frankenburg, Hennen, & Silk 2004). Despite of that, the overall societal costs of BPD remain high (Ansell et al., 2007; Asselt et al., 2007). BPD patients tend to require more mental-health care resources than do many individuals with other psychiatric conditions (Ansell et al., 2007; Lieb et al., 2004), underlining the importance of early identification and effective treatment planning of the disorder.

#### 1.4 Comorbidity of MDD and BPD

Likewise to MDD, personality disorders frequently co-occur with other psychiatric disorders (Coid 2003; Coid et al., 2006; Grant et al., 2008; Grilo et al., 2000; Grilo et al., 2005; Hayward & Moran 2007; Lenzenweger et al., 2007; Lieb et al., 2004; McGlashan et al., 2000; Samuels et al., 2002; Skodol et al., 2002; Skodol et al., 1999; Tadic et al., 2009; Torgersen et al., 2001; Zanarini et al., 1998; Zimmerman et al., 2005). More specifically, MDD and BPD often co-occur and a large percentage of BPD in- and outpatients (31.3-82.8%) meet the criteria for current co-occurring MDD (Skodol et al., 1999; Zanarini et al., 1998) and many of the currently depressed outpatients (12.2-22.5%) meet the criteria for co-occurring BPD (Grilo et al., 2005; Zimmerman et al., 2005).

BPD patients tend to fulfill the criteria for significantly more psychiatric disorders than patients with other personality disorders or patients with MDD and no personality disorder (Grilo et al., 2000; McGlashan et al., 2000; Zanarini et al., 1998), which may often complicate the treatment and worsen the prognosis (Grilo et al., 2000; Gunderson et al., 2011; Lieb et al., 2004; Newton-Howes et al., 2006; Samuels et al., 2002; Skodol et al., 2002; Skodol et al., 2002; Zanarini et al., 1998). Personality disorders are robust predictors of decelerated remission of MDD, even when controlling other prognostic predictors (Grilo et al., 2005). A comorbid personality disorder is associated with an elevated risk of recurrence and a longer duration of depression: the recovery of an MDD patient slows down if an individual fulfills the criteria for a comorbid personality disorder (Grilo et al., 2005; Lönnqvist et al., 2008; Melartin et al., 2004; Pirkola et al., 2005; Skodol et al., 2002).

Comorbidity of BPD and MDD is associated with increased risk for the number and seriousness of suicide attempts (Black et al., 2004; Soloff et al., 2000).

Moreover, it is well known that BPD patients usually start their treatment meeting criteria for multiple psychiatric disorders, varying over time in their severity and urgency (Gunderson et al., 2011; Lieb et al., 2004; Samuels et al., 2002; Skodol et al., 2002; Zanarini et al., 1998). The increasing amount and severity of depressive episodes, comorbid dysthymic disorder and lifetime comorbidity of mood- and impulse control disorders predict co-occurring BPD and its clinical course (Goodman et al., 2010; Skodol et al., 2002; Skodol et al., 1999; Zanarini et al., 1998). On the other hand, according to Skodol and colleagues (2002) BPD assessment should be embedded in a comprehensive assessment of psychiatric disorders to evaluate the effect of the comorbidity on the prognosis and the clinical course of BPD itself. Generally BPD patients remit dramatically more slowly but relapse less often than MDD patients (Gunderson et al., 2011). However, there is no consistent view if a disorder such as MDD leads to the development of traits and behavior found in BPD, or whether a disorder such as BPD, predisposes an individual to depressive states like MDD as a secondary symptomatic cause (Skodol et al., 2002), underlining the importance of further research in this field.

### 1.5 Young's Schema Theory

Young (1990, 1994, 1999) and Young and colleagues (2003) developed the construct of Early Maladaptive Schemas (EMSs) to describe the deepest level of cognitive structures representing the self in relation to others and the environment. EMSs refer to internalized representations of the self and others, that are based on early developmental experiences of unmet basic emotional needs such as connectedness, autonomy, worthiness, reasonable expectations and realistic limits in the relationships with significant others (Young 1990, 1994; Young et al., 2003). EMSs can be seen to form a cognitive core of an individual's self-concept that guides perception and information processing regarding the self and the environment, and develop as somewhat effective adaptations to the childhood environment (Ryle 1982).

These internalized representations developed as adaptations to the childhood environment, may overgeneralize dysfunctionally to situations later in life. For example, a family-rule that emotional expression is not acceptable in the family environment may result in overemphasized emotional inhibition relating to difficulties in self-expression later in life. EMSs remain latent until becoming activated by life events (Young, et al., 2003). Activated EMSs generate negative emotions and automatic thoughts (Young et al., 2003) that may spiral into psychiatric outcomes such as MDD and BPD later in life. For example, EMS of Defectiveness and Shame, characterized by thoughts and feelings of worthlessness and unlovability, may develop if a child is overly criticized of not meeting the parental standards during childhood (Young et al., 2003). Triggered EMS results in high levels of negative emotions and automatic thoughts, and child must cope with the risen negative emotions and distress by avoiding, surrendering or overcompensating the given situations (Young et al., 2003). EMSs are hypothesized to play a causal role in the later psychopathology (Young et al., 2003), and may thus be considered as predisposing factors for the development and the maintenance of later psychiatric symptom states (Wang et al., 2010). Hence, assessing EMSs has important clinical relevance.

Young (1990) originally hypothesized 16 primary EMSs, later on 15 primary EMSs (Young 1994), and finally 18 primary EMSs (Young, et al., 2003) that reflect the cognitive structures representing interpretations of the self and others, and grouped them into five higher-order schema domains reflecting the unmet basic emotional needs described above. More specifically, the 18 EMSs described by Young and colleagues (2003) are Emotional Deprivation, Abandonment and Instability, Mistrust and Abuse, Defectiveness and Shame, Social Isolation and Alienation, Self-Sacrifice, Subjugation, Approval-Seeking and Recognition-Seeking, Vulnerability to Harm or Illness, Failure to Achieve, Dependence and Incompetence, Enmeshment and Undeveloped Self, Negativity and Pessimism, Emotional Inhibition, Unrelenting Standards and Hypercriticalness, Punitiveness, Entitlement and Grandiosity, and Insufficient Self-Control and Self-Discipline. The key themes of the EMSs described by Young and colleagues (2003) are shortly described below.

*Emotional Deprivation* refers to an expectation that others will not adequately meet individual's needs for emotional support. *Abandonment and Instability* relates to a perception that significant others will abandon the individual in favor of something or someone better or will not be able to continue to give adequate support or care. *Mistrust and Abuse* is characterized by expectations that other people will hurt, abuse or take advantage

of the individual, either intentionally or as a result of negligence. *Defectiveness and Shame* refers to a feeling that individual is fundamentally invalid, faulty, inadequate or unwanted compared with the others. *Social Isolation and Alienation* reflects a sense of “not belonging” and feelings that individual is fundamentally different from other people and isolated from the rest of the world. *Self-Sacrifice* is characterized by a need to meet the needs of the others at the expense of individual’s own gratification, often motivated by guilt, and *Subjugation* is characterized by an excessive surrender of control of others. *Approval-Seeking and Recognition-Seeking* reflects a need to gain approval or recognition from other people at the expense of developing a true and secure sense of self. *Vulnerability to Harm or Illness* refers to an exaggerated fear of a haphazard and uncontrollable disaster. *Failure to Achieve* reflects beliefs that an individual has failed or will inevitably fail and is fundamentally inadequate compared with the others in areas of achievement. *Dependence and Incompetence* is characterized by beliefs that an individual is unable to master everyday life tasks in a competent manner without a considerable support of others, and is often present as helplessness. *Enmeshment and Undeveloped Self* reflects an excessive emotional contact and closeness with significant others at the expense of full individuation or normal social development. *Negativity and Pessimism* is characterized by an excessive focus on the negative aspects of life and exaggerated expectations of potential negative outcomes in different areas of life. *Emotional Inhibition* is characterized by a need to inhibit individual’s own spontaneous actions and reactions, usually to avoid feelings of shame or disapproval by others. *Unrelenting Standards and Hypercriticalness* refers to a belief that an individual needs to strive and exert oneself to meet the very high internalized standards of performance and behavior typically to avoid criticism. *Punitiveness* is characterized by beliefs that people should be harshly punished for making mistakes and *Entitlement and Grandiosity* reflects beliefs that individual is superior compared with other people, and therefore entitled to special privileges. *Insufficient Self-Control and Self-Discipline* reflects difficulties in frustration tolerance, impulse- and self-control to achieve individual’s personal goals.

### *1.5.1 The Young Schema Questionnaire*

The Young Schema Questionnaire (YSQ) (Young, 1990) is a 205-item self-report inventory originally designed to measure the 16 EMSs described by Young (1990). The existence of the EMSs and higher-order schema domains has been subjected to psychometric evaluation and the majority of the EMSs have been supported in student and clinical samples (Calvete et al., 2005; Hoffart et al., 2005; Lee, Taylor & Dunn 1999; Rijkeboer et al., 2005; Schmidt et al., 1995; Van Vlierberghe et al., 2010; Welburn et al., 2002). In addition to the long form of YSQ, Young and Brown (1998) developed a shorter form of YSQ, (YSQ–SF), which is a 75-item self-report inventory to measure the largely supported 15 EMSs described by Young (1994). A 15 first-order factor structure is generally agreed (Calvete et al., 2005; Hoffart et al., 2005; Lee et al., 1999; Rijkeboer et al., 2005; Schmidt et al., 1995; Van Vlierberghe et al., 2010; Welburn et al., 2002), but also alternative models have been proposed (Lee et al., 1999; Saariaho et al., 2009; Schmidt et al., 1995). In addition to the first-order factor structure, models of three higher-order schema domains (Calvete et al., 2005; Schmidt et al., 1995) and four higher-order schema domains (Hoffart et al., 2005; Lee et al., 1999) have been proposed. However, on the contrary to the general agreement on the existence of 15 EMSs, the results on the higher-order schema domains are less consistent (Calvete et al., 2005; Hoffart et al., 2005; Lee et al., 1999; Saariaho et al., 2009; Schmidt et al., 1995; Van Vlierberghe et al., 2010; Welburn et al., 2002). The latest version of Young Schema Questionnaire –Short form (YSQ-S3) (Young 2005) differs from the previous YSQ–SF (Young & Brown 1998): YSQ–S3 (Young 2005) is a 90-item self-report questionnaire to measure the 18 EMSs hypothesized by Young and his colleagues (2003), and the items are no longer grouped in to the higher-order schema domains. The 18 first-order factor structure model hypothesized by Young and Brown (2003) and Young (2005), has been supported in Finnish population (Saariaho et al., 2009).

### *1.5.2 Early Maladaptive Schemas and Depressive Symptomatology*

The association between EMSs and depressive symptomatology has been widely studied among non-clinical young adults (Calvete et al., 2005; Harris & Curtin 2002; Schmidt et al., 1995; Wright, Crawford & Del Castillo 2009) and outpatients (Halvorsen et al., 2009; Halvorsen, Wang, Eisemann & Waterloo 2010; Hoffart et al., 2005; Petrocelli, Glaser, Calhoun & Campbell 2001; Renner, Lobbestael, Peeters, Arntz, & Huibers 2012; Shah & Waller 2000; Thimm 2010; Van Vlierberghe et al., 2010; Welburn, et al., 2002). EMSs are proven valid in predicting depressive symptomatology and symptom severity (Calvete et al., 2005; Halvorsen et al., 2009; Halvorsen, Wang, Eisemann & Waterloo 2010; Harris & Curtin 2002; Hoffart et al., 2005; Petrocelli, et al., 2001; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; Thimm 2010; Van Vlierberghe et al., 2010; Welburn, et al., 2002). Preliminary evidence also suggests that EMSs may have validity in the prediction of depressive symptoms even over the Five Factor Model personality dimensions (Thimm 2010).

Higher scores on eight of the 18 EMSs are consistently related to depressive symptomatology in clinical and non-clinical populations, more specifically those of Defectiveness and Shame (Calvete et al., 2005; Harris & Curtin 2002; Schmidt et al., 1995; Shah & Waller 2000; VanVlierberghe et al., 2010; Welburn, et al., 2002; Wright et al., 2009), Insufficient Self-Control and Self-Discipline (Harris & Curtin 2002; Shah & Waller 2000; Welburn et al., 2002), Failure to Achieve (Calvete et al., 2005; Renner et al., 2012; VanVlierberghe et al., 2010; Welburn, et al., 2002), Self-Sacrifice (Calvete et al., 2005; Shah & Waller 2000; Welburn, et al., 2002; Wright et al., 2009), Dependence and Incompetence (Harris & Curtin 2002; Schmidt et al., 1995; VanVlierberghe et al., 2010; Welburn, et al., 2002), Vulnerability to Harm or Illness (Harris & Curtin 2002; Welburn et al., 2002; Wright et al., 2009), Abandonment and Instability (Renner et al., 2012; Welburn et al., 2002) and Emotional Deprivation (Renner et al., 2012; VanVlierberghe et al., 2010). Less consistently, also Social Isolation and Alienation, Emotional Inhibition, Mistrust and Abuse, Subjugation and Unrelenting Standards and Hypercriticalness have been shown to be associated with depressive symptomatology (Welburn et al., 2002).

Defectiveness and Shame, Self-Sacrifice, Insufficient Self-Control and Self-Discipline, Failure to Achieve and Abandonment and Instability are consistently associated with depression, and predict depressive symptomatology and symptom severity both in clinical

and non-clinical populations (Calvete et al., 2005; Harris & Curtin 2002; Renner et al., 2012; Shah & Waller 2000; VanVlierberghe et al., 2010; Welburn et al., 2002; Wright et al., 2009). These EMSs may relate to negative and pessimistic views of the self and life typically present in depression and possibly reflect little different characteristics among clinical and non-clinical populations. For example, Failure to Achieve reflecting “the destination to fail”, could be interpreted as a predisposing factor for depressive symptomatology among students who face relatively high standards to meet in their everyday life, while it can reflect other conditions in clinical populations, such as functional impairment strongly related to depressive symptom severity.

It is important to notice that most of the studies are cross-sectional (Calvete et al., 2003; Harris & Curtin 2002; Schmidt et al., 1995; Shah & Waller 2000; Welburn et al., 2002; Wright et al., 2009), limiting the interpretation of the associations, with the exception of Renner and colleagues (2012) who had a somewhat more longitudinal study design. Most of the samples are drawn from less heterogeneous populations such as student or patient populations (Calvete et al., 2003; Harris & Curtin 2002; Renner et al., 2012; Schmidt et al., 1995; Welburn et al., 2002; Wright et al., 2009), are unevenly distributed in terms of gender (Calvete et al., 2003) and lack a control group (Calvete et al., 2003; Harris & Curtin 2002; Renner et al., 2012; Schmidt et al., 1995; Welburn et al., 2002; Wright et al., 2009). The strength of the designs of Shah and Waller (2000) and VanVlierberghe and colleagues (2010) is that the samples included referred and non-referred participants. In the assessment of psychopathology, only Renner and colleagues (2012) and VanVlierberghe and colleagues (2010) used a clinical interview in addition to the self-report inventories. Most of the studies rely on self-report instruments (Calvete et al., 2003; Harris & Curtin 2002; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; Welburn et al., 2002; Wright et al., 2009), which may increase the possibility of shared method variance potentially inflating the assessed associations between EMSs and depressive symptomatology.



### *1.5.3 Early Maladaptive Schemas and BPD Symptomatology*

The associations between EMSs and BPD pathology are previously studied among non-clinical populations (Reeves & Taylor 2007; Schmidt, Joiner, Young & Telch 1995; Specht, et al., 2009) and outpatients (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005). However, so far the research focusing on the associations between EMSs and BPD symptomatology and symptom severity is less coherent compared with the research focusing on the associations between EMSs and depression.

Generally, higher scores on 13 of the 18 EMSs are associated with elevated BPD symptomatology, more specifically on those of Abandonment and Instability (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005; Reeves & Taylor 2007), Social Isolation and Alienation (Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005; Reeves & Taylor 2007), Mistrust and Abuse (Ball & Cecero 2001; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), Dependence and Incompetence (Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005) Defectiveness and Shame (Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), Vulnerability to Harm or Illness (Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), Emotional Deprivation (Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), Enmeshment and Undeveloped Self (Nilsson et al., 2010; Reeves & Taylor 2007), Unrelenting Standards and Hypercriticalness (Nilsson et al., 2010), Failure to Achieve (Lawrence et al., 2011; Nilsson et al., 2010), Subjugation (Lawrence et al., 2011; Nilsson et al., 2010), Emotional Inhibition (Lawrence et al., 2011; Nilsson et al., 2010) and Insufficient Self-Control and Self-Discipline (Lawrence et al., 2011; Nilsson et al., 2010). On the other hand, according to the results of Nilsson and colleagues (2010), higher scores on all 18 EMSs were associated with BPD symptomatology.

Abandonment and Instability is the most consistently and reliably associated EMS with BPD pathology both in clinical and non-clinical populations (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005; Reeves & Taylor 2007). Abandonment and Instability relates to expectations that individual's close emotional attachments will come to an end (Young et al., 2003). BPD patients are typically very sensitive to environmental circumstances and perceptions of separation or rejection

(APA 2013; Lieb et al., 2004). In line with the previous results associating personality disorder characteristics with EMS severity (Petrocelli et al., 2001; Schmidt et al., 1995; Lee et al., 1999), Abandonment and Instability was uniquely associated with BPD symptomatology in non-clinical population (Reeves & Taylor 2007) and among outpatients receiving treatment for substance use (Ball & Cecero 2001). However, according to the results of Nordahl and colleagues (2005), Abandonment and Instability also correlated with paranoid and dependent personality traits, and as such, the association between Abandonment and Instability and personality disorder symptomatology was not specific to BPD. These results suggest that Abandonment and Instability might potentially act as a specific vulnerability factor for BPD pathology below the clinical cutoff. As previously mentioned, BPD frequently co-occurs with other psychiatric disorders (Grilo et al., 2000; Gunderson et al., 2011; Lieb et al., 2004; Samuels et al., 2002; Zanarini et al., 1998), which may partly explain the found unspecificity of the association among psychiatric outpatients (Nordahl et al., 2005).

Mistrust and Abuse, reflecting expectations of being abused or mistreated by others, is consistently associated with BPD symptomatology (Ball & Cecero 2001; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), potentially reflecting the insecure attachment features characteristic for BPD. Also Social Isolation and Alienation is related to BPD symptomatology both in clinical and non-clinical populations (Lawrence et al., 2011; Nordahl et al., 2005; Nilsson et al., 2010; Reeves & Taylor 2007), but not among outpatients receiving treatment for substance use (Ball & Cecero 2001). Social Isolation and Alienation reflects the sense of not belonging, characterized by beliefs that individual is isolated from the world and fundamentally different from other people (Young et al., 2003). Sense of social isolation and “not belonging” might reflect the unstable sense of self as well as chronic feelings of emptiness, closely relating to core BPD pathology. Both Mistrust and Abuse and Social Isolation and Alienation are consistently associated with BPD symptomatology but not with depression (Calvete et al., 2005; Harris & Curtin 2002; Petrocelli et al., 2001; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; Van Vlierberghe et al., 2010; Wellburn, et al., 2002; Wright et al., 2009), underlining the importance to further investigate these EMSs as potentially specific trait-like vulnerability factors for BPD symptomatology.

The results on the associations between BPD symptomatology and other EMSs are less consistent. Self-Sacrifice, Failure to Achieve and Insufficient Self-Control and Self-Discipline are not associated with BPD symptomatology (Ball & Cecero 2001; Jovev &

Jackson 2004; Nordahl et al., 2005; Reeves & Taylor 2007), except in some studies (Lawrence et al., 2011; Nilsson et al., 2010), but are consistently associated with depressive symptomatology (Calvete et al., 2005; Harris & Curtin 2002; Renner et al., 2012; Shah & Waller 2000; VanVlierberghe et al., 2010; Welburn et al., 2002; Wright et al., 2009), suggesting that instead of BPD, these EMSs may potentially reflect more specific vulnerability factors for depression.

Defectiveness and Shame, Dependence and Incompetence, Emotional Deprivation as well as Vulnerability to Harm or Illness are related to BPD symptomatology among psychiatric outpatients (Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005) but not among outpatients receiving treatment for substance use (Ball & Cecero 2001). These associations are not specific to BPD: Defectiveness and Shame, Dependence and Incompetence, Emotional Deprivation and Vulnerability to Harm or Illness are also associated with depressive symptomatology (Calvete et al., 2005; Harris & Curtin 2002; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; VanVlierberghe et al., 2010; Wright et al., 2009). In addition, the association between Enmeshment and Undeveloped Self and BPD is inconsistent (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nordahl et al., 2005; Reeves & Taylor 2007). Enmeshment and Undeveloped Self was negatively associated with BPD symptomatology among non-clinical young adults (Reeves & Taylor 2007), but not associated with BPD pathology in clinical populations (Ball & Cecero 2001; Lawrence et al., 2011; Nordahl et al., 2005) except in the study of Nilsson and colleagues (2010) where the association was positive.

The generalizability of the results mentioned above is limited. Firstly, most of the studies focusing on the associations between EMSs and BPD symptomatology are cross-sectional and correlative by nature. Secondly, only Nilsson and colleagues (2010) focused on all the 18 EMSs described by Young and colleagues (2003), all the other studies rely on the previous forms of YSQ and YSQ-SF with 15 or 16 EMSs. Thirdly, most of the studies have relatively small sample sizes (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005), especially small BPD subsamples (Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010) that practically lack male participants (Lawrence et al., 2011; Nilsson et al., 2010). Most of the samples are drawn from outpatient populations (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005) limiting the interpretation of the associations. Only Schmidt and colleagues (1995) and Reeves and Taylor (2007) assessed the

associations in non-clinical population, and only Reeves and Taylor (2007) focused on the predictive associations in their large non-clinical student sample. Both Schmidt and colleagues (1995) and Reeves and Taylor (2007) relied on self-report questionnaires on the assessment of psychopathology, while Jovev and Jackson (2004), Lawrence and colleagues (2011) and Nordahl and colleagues (2005) used clinical interviews increasing the reliability of their results. On the other hand, the methodological strengths of the study of Reeves and Taylor (2007) were the large sample size and the use of both genders and the symptoms of other personality disorders and other core beliefs as covariates.

#### *1.5.4 Early Maladaptive Schemas and BPD and Affective Disorders*

To the best of my knowledge, even though EMSs are generally proposed to characterize the cognitive vulnerabilities for later psychiatric symptom states such as depression and BPD, there are no studies focusing on the associations between EMSs and BPD symptomatology among currently depressed inpatients. Two studies touch on the subject, those of Lawrence and colleagues (2011) and Nilsson and colleagues (2010), who investigated the relationship between EMSs and BPD symptomatology in women outpatient samples including BPD and DSM-IV Axis I affective pathology. The outpatient sample of Nilsson and colleagues (2010) comprised subgroups of BPD patients, bipolar-I patients and healthy student controls, and the sample of Lawrence and colleagues (2011) comprised of young adults with BPD or BPD with comorbid MDD and healthy controls.

According to the best of my knowledge, only Lawrence and colleagues (2011) have investigated the EMS endorsement among BPD patients with comorbid depression. Patients with comorbid BPD and MDD scored significantly higher on Vulnerability to Harm or Illness, Subjugation and Self-Sacrifice compared with patients with only BPD. However, somewhat controversially, they concluded that EMSs do not have strong predictive value for BPD pathology among depressed individuals. On the other hand, compared with bipolar patients, patients with BPD scored significantly higher on most of the EMSs with the exception of Failure to Achieve, Enmeshment and Undeveloped Self, Self-Sacrifice and Entitlement and Grandiosity (Nilsson et al., 2010). These results are partly in line with the previous literature related to the associations between EMSs and mood disorders; Self-Sacrifice and Failure to Achieve associates with depressive symptomatology and symptom

severity (Calvete et al., 2005; Harris & Curtin 2002; Renner et al., 2012; Shah & Waller 2000; VanVlierberghe et al., 2010; Welburn et al., 2002; Wright et al., 2009), but not with BPD symptomatology (Ball & Cecero 2001; Jovev & Jackson 2004; Nordahl et al., 2005; Reeves & Taylor 2007). According to the conclusions of Nilsson and colleagues (2010), although EMSs are proposed to characterize vulnerability factors for both bipolar disorder and BPD, BPD patients potentially endorsed negative and distressing beliefs about themselves and their relations to others to a larger extent, suggesting that they seem to be more severe in BPD.

It has to be taken into account that the results of Lawrence and colleagues (2011) have major limitations, and can only be considered as preliminary: BPD group comprised mostly individuals with comorbid BPD and MDD, and they did not sufficiently pay attention to the inter-correlative nature of EMSs. When comparing subgroups with comorbid MDD and BPD, and BPD-only, the sizes of the subsamples drop very low with respect to the methodological choices made, strongly limiting the interpretation of the results. Nilsson and colleagues (2010) had a relatively small sample as well and both of the patient-subsamples were medicated which may have contributed to the results limiting their generalizability. Both of the studies lack male participants and a clinical control group. The methodological strength of the studies is that personality pathology was assessed via clinical interview.

In summary, Abandonment and Instability, Defectiveness and Shame, Dependence and Incompetence, Vulnerability to Harm or Illness, Failure to Achieve, Insufficient Self-Control and Emotional Deprivation are associated with both depressive and BPD symptomatology and symptom severity, potentially reflecting general risk factors for vulnerabilities that are characteristic to both depression and BPD or psychopathology overall. Interestingly, Social Isolation, Mistrust and Abuse, Subjugation, Emotional Inhibition and Unrelenting Standards and Hypercriticalness are in positive association with BPD but not associated with depression, potentially reflecting cognitive core vulnerabilities that are more specifically related to BPD symptomatology and symptom severity. Generally speaking, due to the study designs the results on the associations between EMSs and MDD are more robust compared with the results on the associations between EMSs and BPD.

## **2. The Research Questions**

Although the comorbidity of BPD and MDD is a well-recognized challenge in psychiatric care and long been the object of interest in the field of research, and the associations between EMSs and depression and EMSs and BPD symptomatology are widely but separately studied among outpatients and non-clinical populations, the associations between EMSs and psychiatric comorbidity in more severely ill psychiatric populations have rarely been studied.

The aim of the present study is to provide new insight into the comorbidity of BPD and MDD by focusing on the associations between EMSs and BPD symptomatology among currently depressed individuals and to expand the existing literature to the associations between EMSs and BPD symptomatology among a more severely ill psychiatric population. Because studies on the associations between EMSs and BPD pathology among depressed inpatients do not, to my knowledge, exist, the research questions of the present study are explorative by their nature.

The research questions are the following:

1. Are self-reported YSQ-S2-extended EMSs positively associated with self-reported BPD symptomatology and symptom severity in depressed inpatient population?
2. Are self-reported YSQ-S2-extended EMSs positively associated with self-reported BPD symptomatology and symptom severity in depressed inpatient population over the current depressive symptomatology?

### **3. Methods**

#### **3.1 Participants**

The current study sample included forty-three (n=43) inpatients (29 women and 14 men), who were recruited from two inpatient wards at Aurora psychiatric hospital in Helsinki. Included patients all screened positive for current depression and patients with bipolar disorder were excluded.

#### **3.2 Procedure**

New patients arriving to Aurora psychiatric hospital were screened for current depression and bipolar disorder by ward staff. Current depression was screened via the Beck Depression Inventory –II (BDI–II), and bipolar disorder was screened with Mood Disorder Questionnaire (MDQ) (Hirschfeld et al., 2000). After the screening procedure patients were informed about the study and asked to participate. The research protocol was approved by Ethics Committee of Helsinki and Uusimaa Hospital District. All participants gave written informed consent to participate in the study. Thereafter, the ward staff contacted the researchers responsible for the data collection and reserved an appointment for the patient. Participation to the study included two appointments with one of the two researchers in charge of the data collection, lasting approximately two hours for a time. The participants completed various psychological self-report questionnaires in the two appointments. All participants filled-in the questionnaires in the same order. In addition to the self-report questionnaires of interest, assessment procedure included the NEO-Personality Inventory (NEO-PI) (Costa & McRae 1992), Parental Bonding Instrument (PBI) (Chambers, Power, Loucks & Swanson 2000; Parker 1989; Parker, Tupling, & Brown 1979), Personality Structure Questionnaire (PSQ) (Pollock, Broadbent, Clarke, Dorrian & Ryle 2001), McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD) (Gardner & Qualter 2009; Melartin, Häkkinen, Koivisto, Suominen & Isometsä 2009; Zanarini, Vujanovic, Parachini, Boulanger, Frankenburg & Hennen 2003), and a modified version of the State Description Procedure -Revised (SDP-R) (Bennett, Pollock & Ryle 2005; Bennett & Ryle 2005; Ryle 2007). The three phases of the whole assessment procedure are presented below

in Table 4. A researcher was present for the whole appointment to answer the participant's questions about the assessment procedure. If the reserved two-hour time was too short, participants were able to finish the questionnaires independently, and return them to the researcher when completed.

Table 4.

*The assessment procedure*

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<u>Screening procedure</u>	<u>Appointment 1</u>	<u>Appointment 2</u>
BDI-II $\geq 20$	NEO-PI	MSI-BPD
MDQ negative	PBI	BDI-II
	<b>YSQ</b>	SDP-RF
	<b>SCID-PQ</b>	Feedback
	<b>CES-D</b>	
	PSQ	

---

### 3.3 Study Questionnaires

#### 3.3.1 Depression and Bipolar Disorder Questionnaires

BDI-II is a self-report questionnaire consisting of 21 items (Beck, Steer & Brown 1996; Steer, Clark, Beck & Ranieri 1998). On each item there are four statements relating to depressive symptomatology and participants are instructed to choose the option that best describes their current mood. Items are rated on a four-point likert scale ranging from 0 to 3, with 0 for normal or least depressed mood and 3 for the most depressed mood (i.e. 0="I am not sad" 3="I am so sad or unhappy that I can't stand it"). The BDI-II is extensively validated and has shown a good to excellent internal consistency in several studies (Beck, Steer, Ball & Ranieri 1996; Beck et al., 1996; Kjaergaard, Wang, Waterloo & Jorde 2014; Storch, Roberti & Roth 2004; Steer et al., 1998; Whisman, Perez & Ramel 2000; Viinamäki et al., 2004). Among Finnish outpatients, BDI-II has been shown to detect major depressive episodes regardless of the phase of the disorder (Viinamäki et al., 2004). In this study, cutoff



BDI-II score of  $\geq 20$  was used to ensure the current depressive state, which is comparable to moderate or more severe states of depression (Beck et al., 1996).

MDQ is a self-report questionnaire that comprises three sections. The first section contains statements related to manic and hypomanic symptoms (“Has there ever been time when you were not your usual self and.. i.e. You felt much more energetic than normally?”), and participants are instructed to answer “yes or no” according to their own experiences. In the second section participants are asked whether the symptoms were experienced at the same time (“yes or no”). In the third section the participants are asked on a four-point likert scale, to which degree the symptoms caused harm for the participants, ranging from 1 “no problem” to 4 “serious problem”. Even though the sensitivity of MDQ has been a subject of debate (Hirschfeld et al., 2000; Hirschfeld, et al., 2003; Miller, Klugman, Berv, Rosenquist & Nassir Ghaemi, 2004; Twiss, Jones & Anderson 2008), MDQ has been reported to be suitable in detecting bipolar disorder and to have an acceptable to excellent level of internal consistency (Hirschfeld et al., 2000; Hirschfeld, et al., 2003; Isometsä, et al., 2000; Twiss et al., 2008). In this study, MDQ cutoff score of  $\geq 7$  recommended by Hirschfeld and colleagues (2000) was used. All participants above the cutoff score were excluded from the study.

Hence, the screening process resulted in a sample of currently depressed inpatients with no bipolar disorder.

### *3.3.2 Depressive Symptom Measurement*

During the first appointment the current depressive symptoms were assessed via the Center for Epidemiological Studies Depression Scale (CES-D), which is a self-report questionnaire consisting of 20 statements related to depressive symptomatology (e.g. “I was bothered by things that usually don’t bother me”). On each item, participants are instructed to describe on a four-point likert scale how frequently they experienced the symptoms during the past week (0=“Rarely or never, or less than a day”, to 3=“All of the time, or for 5-7 days”). CES-D was originally designed to measure depressive symptomatology in a general population (Radloff 1977), but it has shown to detect depressive symptomatology and symptom severity in clinical populations as well (Husaini, Neff, Harrington, Hughes & Stone 1980; Santor, Zuroff, Ramsay, Cervantes & Palacios 1995). The internal consistency of CES-D has been

reported to be from acceptable to excellent (Hann, Winter & Jacobsen 1999; Knight, Williams, McGee & Olaman 1997; Orme, Reis & Herz 1986; Radloff 1977; Zhang, Sun, Kong & Wang 2012). In the current study, the internal consistency of CES-D was good overall (Cronbach's  $\alpha = .82$ ), and for women (Cronbach's  $\alpha = .81$ ) and men (Cronbach's  $\alpha = .82$ ) separately.

### *3.3.3 BPD Symptom Measurement*

During the first appointment, BPD symptoms were assessed via the BPD section of the Structured Clinical Interview for DSM-III-R Personality Questionnaire (SCID-PQ), which is a 15-item self-report questionnaire based on the Structured Clinical Interview for DSM-III-R Personality Disorders (Spitzer, Williams, Gibbon & First 1990; First, Spitzer, Gibbon & Williams 1995). SCID-PQ contains 15 statements related to BPD symptomatology (e.g. "Are your close relationships typically full of extreme ups and downs?"). Participants are instructed to rate the items according to their own experiences ("yes" or "no), after which the amount of positive answers are counted. The total score reflecting the endorsed BPD symptomatology has been shown to be correlated with BPD diagnoses set via structured clinical interviews (Chanen et al., 2008; Korzekwa, Dell, Links, Thabane & Webb 2008). The later version of SCID-PQ for DSM-IV Personality Axis II disorders (First, Gibbon, Spitzer, Williams & Benjamin 1997) has shown to have an adequate to good level of internal consistency in clinical populations (Chanen et al., 2008; Maffei et al., 1997). On the other hand, the sensitivity of the scale is debatable (Korzekwa et al., 2008). However, self-report questionnaires related to personality pathology have shown to function more robustly in clinical populations compared with general population (Morse & Pilkonis 2007), supporting the use of a self-report questionnaire in the current psychiatric inpatient sample. In the current study the internal consistency of SCID-PQ was acceptable overall (Cronbach's  $\alpha = .78$ ), and for women (Cronbach's  $\alpha = .77$ ) and men (Cronbach's  $\alpha = .78$ ) separately.

### 3.3.4 EMS Measurement

EMSs were measured by the Finnish version of the extended Young Schema Questionnaire–short form (YSQ–S2-extended) (Saariaho et al., 2009). YSQ–S2-extended is a 90-item self-report questionnaire measuring 18 EMSs originally described by Young, and his colleagues (2003). YSQ–S2-extended consists of 90 statements (e.g. “I feel like I can’t master my everyday life tasks independently”) to which the participants are instructed to answer on a six-point likert scale (1=“Completely untrue of me” 6=“Describes me perfectly”) according to their own experiences. YSQ–S2-extended (Saariaho et al., 2009) is constructed from the 75-item YSQ–S2 (Young & Brown 2003) with added items from the YSQ–L3a (Young, et al., 2003), and can be considered comparable to the latest version YSQ–S3 (Young 2005). In line with Saariaho and colleagues (2009), in the current study sample the internal consistency of the entire YSQ-S2-extended was excellent (Cronbach’s  $\alpha = .97$ ) overall, and for women (Cronbach’s  $\alpha = .97$ ) and men (Cronbach’s  $\alpha = .94$ ) separately. In the present study, the internal consistencies of all the individual 18 YSQ–S2-extended subscales varied from acceptable (Cronbach’s  $\alpha = .74$ ) to excellent (Cronbach’s  $\alpha = .95$ ) overall, as for women (Cronbach’s  $\alpha = .78 - .96$ ) and men (Cronbach’s  $\alpha = .66 - .94$ ) separately. The theoretically expected higher-order schema domain structure did not emerge in the present study (data not shown), supporting the use of the 18 individual YSQ subscales. Hence, further analysis were made on each individual YSQ-S2-extended subscales separately.

### 3.3.5 Covariates

Data on sociodemographic factors was collected via self-report questionnaire in the first research assessment appointment. Education variable was categorized according to the highest attained education level into two categories that represented either low-education (only primary school) or relatively high education (vocational studies, upper secondary school, applied science- or university degree). Employment status was categorized into two categories according to the current employment status (Employed/Unemployed) at the date of data collection. All who were not currently in employment relationship (e.g. pensioners), were classified as unemployed. Age was treated as a continuous variable, representing the age of the participant (in years) at the date of data collection.

### 3.4 Statistical Analyses

The total score variable for SCID-PQ was counted based on the given positive answers, and the standardized total score variable was used in further analysis. The total sum score variable for CES-D was counted, and the standardized total score variable was used in further analysis. The total mean score variables for individual YSQ-S2-extended subscales were counted based on the five items measuring each subscale and the normalized total mean score variables were used in further analysis. Two of the 18 YSQ-S2-extended subscales (Failure to achieve and Approval-seeking/Recognition-seeking) turned out skewed and square root transformed subscale variables were created and used in further analysis.

The primary effects of gender, education and employment status on individual YSQ-S2-extended subscales and SCID-PQ and CES-D total scores were explored via Student's t-tests. The associations between age and YSQ-S2-extended subscales and SCID-PQ and CES-D total scores were explored via Pearson correlation analysis. Univariate ANOVAs were conducted to explore the gender- YSQ-S2-extended subscale interactions. The inter-correlative associations between YSQ-S2-extended subscales, and the associations between YSQ-S2-extended subscales and SCID-PQ and CES-D total scores were explored via Pearson correlation analysis.

Finally, a three-level linear regression model was created to predict self-reported BPD symptomatology. In level 1 linear regression analysis was conducted for each individual YSQ-S2-extended subscale, subscales entered as predictors for SCID-PQ total score. In level 2 linear regression analysis was conducted for each individual YSQ-S2-extended subscale when the effect of gender, age, education and employment status was controlled. Individual YSQ-S2-extended subscales were entered as predictors for SCID-PQ total score and gender, age, education and employment status were added to the model as covariates. In level 3 linear regression analysis was conducted for individual YSQ-S2-extended subscales when the current level of depressive symptom state was controlled in addition to the previously controlled variables. Individual YSQ-S2-extended subscales were entered the model as predictors for SCID-PQ total score, and CES-D total score, gender, age, education and employment status were added to the model as covariates.

Analysis were performed by IBM SPSS Statistics 22.

## 4. Results

### 4.1 Descriptive Statistics

The average age of the sample was 37.86 years ( $SD = 15.49$ ). The majority of the sample (62.80%,  $n = 27$ ) was currently unemployed at the beginning of the assessment procedure, and 37.20% ( $n = 16$ ) was currently employed. The majority of the sample (76.70%,  $n = 33$ ) was relatively highly educated (had either vocational studies, upper secondary school, applied science- or university degree as the highest attained education level) and 23.30% ( $n = 10$ ) of the sample was low-educated (had primary school as the highest attained education level).

In the present inpatient sample, the mean SCID–PQ score was 7.58 ( $SD = 3.45$ ). The mean CES–D score was 40.74 ( $SD = 8.23$ ), which can be considered relatively high. SCID–PQ and CES–D scales were marginally significantly positively correlated with each other ( $r = .29$ ,  $p = .06$ ). Neither gender, education level, nor employment status of the participants were associated with SCID–PQ or CES–D symptom scores (all  $p$ -values  $\geq .13$ ). Age was negatively associated with SCID–PQ symptom score ( $r = -.42$ ,  $p = .01$ ) but not with CES–D score ( $r = -.07$ ,  $p = .68$ ).

The mean scores for individual YSQ–S2-extended subscale raw scores are presented more precisely below in table 5. The sample mean score for square root transformed Failure to Achieve subscale was 1.48 ( $SD = 0.36$ ) and for square root transformed Approval-Seeking/Recognition-Seeking subscale was 1.44 ( $SD = 0.31$ ). Age was negatively associated with Dependence/Incompetence ( $r = -.40$ ,  $p < .01$ ). Also women reported higher scores on Dependence/Incompetence compared with men (mean difference = .68,  $p = .04$ ), as did low-educated participants compared with highly educated participants (mean difference = -.99,  $p < .01$ ). Age was significantly and positively associated with Unrelenting Standards/Hypercriticalness ( $r = .01$ ,  $p < .01$ ). Also low-educated participants reported higher scores on Unrelenting Standards/Hypercriticalness (mean difference = -.76,  $p = .04$ ) compared with highly educated participants. In addition to Unrelenting Standards/Hypercriticalness, low-educated participants also reported higher scores on Negativity/Pessimism (mean difference = -.81,  $p = .02$ ) compared with highly educated participants. Employment status was significantly associated with Vulnerability to Harm or

Illness, unemployed participants reported higher scores on Vulnerability to Harm or Illness (mean difference = .69,  $p = .03$ ) compared with employed participants.

Table 5.

*Mean scores and Standard Deviations for YSQ-S2-extended subscale raw scores*

<u>YSQ-S2-extended subscales</u>	<u>M</u>	<u>SD</u>
Emotional Deprivation	3.20	1.44
Abandonment/Instability	3.66	1.46
Mistrust/Abuse	2.84	1.23
Defectiveness/Shame	3.55	1.36
Social Isolation/Alienation	2.99	1.44
Dependence/Incompetence	3.16	1.66
Vulnerability to Harm or Illness	2.68	1.11
Enmeshment/Undeveloped Self	2.90	1.21
Failure to Achieve	2.33	1.15
Entitlement/Grandiosity	2.78	1.19
Insufficient Self-Control/Self-Discipline	3.73	1.25
Subjugation	2.65	1.41
Self-Sacrifice	3.59	1.24
Approval-Seeking/Recognition-Seeking	2.17	1.00
Negativity/Pessimism	3.01	1.17
Emotional Inhibition	3.99	0.99
Unrelenting Standards/Hypercriticalness	4.20	1.21
Punitiveness	3.36	1.07

YSQ-S2-extended subscales correlated highly with each other. The inter-correlations between YSQ-S2-extended subscales are presented in more detail in Table 6.

Table 6.

*Inter-correlations for YSQ-S2-extended subscales*

	ED	AB	MA	DS	SI	DI	VH	EM	ET	IS	SB	SS	NP	EI	US	PU	FA
AB	.32 *																
MA	.43**	.48***															
DS	.68***	.30*	.41*														
SI	.57***	.40*	.58***	.76***													
DI	.13	.15	.39*	.34*	.47**												
VH	.30*	.45**	.57***	.43**	.46**	.46**											
EM	.23	.55***	.62***	.24	.45**	.23	.57***										
ET	.38*	.70***	.58***	.42**	.59***	.36*	.69***	.63***									
IS	.11	.18	.09	.12	.09	-.13	.14	.32*	.21								
SB	.59***	.29	.51***	.66***	.73***	.15	.38*	.50***	.53***	.04							
SS	.23	.33*	.27	.37*	.44**	.07	.24	.36*	.25	.19	.44**						
NP	.06	.13	.48***	.26	.38*	.68***	.55***	.30*	.43**	-.04	.23	.03					
EI	.05	.48***	.31*	.24	.40*	.25	.41*	.63***	.58***	.37*	.26	.49***	.20				
US	.37*	.45**	.54***	.38*	.50***	.49***	.45**	.62***	.60***	.10	.40*	.12	.39*	.47***			
PU	.35*	.43**	.62***	.50***	.64***	.46**	.50***	.61***	.53***	.16	.59***	.47**	.27	.57***	.68***		
FA	.35*	.34*	.33*	.34*	.32*	.39*	.54***	.61***	.54***	.23	.41*	.26	.49***	.38*	.47***	.31*	
AS	.14	.43**	.45**	.34*	.46**	.26	.49***	.43**	.42**	-.07	.45**	.40*	.60***	.26	.33*	.36*	.43**

\*= $p \leq .05$  \*\*= $p \leq .005$  \*\*\*= $p \leq .001$ 

ED=Emotional Deprivation, AB=Abandonment/Instability, MA=Mistrust/Abuse, DS=Defectiveness/Shame, SI=Social Isolation/Alienation, DI=Dependence/Incompetence, VH=Vulnerability to Harm or Illness, EM=Enmeshment/Undeveloped Self, ET=Entitlement/Grandiosity, IS=Insufficient Self-Control/Self-Discipline, SB=Subjugation, SS=Self-Sacrifice, NP=Negativity/Pessimism, EI=Emotional Inhibition, US=Unrelenting Standards/Hypercriticalness, PU=Punitiveness, FA=Failure to Achieve, AS=Approval-Seeking/Recognition-Seeking

#### *4.2 YSQ-S2-extended Early Maladaptive Schemas and SCID-PQ BPD Symptoms*

We found that multiple of the YSQ–S2-extended subscales were significantly positively associated with SCID–PQ BPD symptoms in the current inpatient sample. In the linear regression models, several YSQ–S2-extended subscales emerged as significant predictors for BPD symptoms. The results are presented in more detail below in Table 7.

More precisely, higher scores on subscales of Abandonment/Instability, Mistrust/Abuse, Dependence/Incompetence, Enmeshment/Undeveloped Self, Entitlement/Grandiosity, Approval-Seeking/Recognition-Seeking, Negativity/Pessimism, Emotional Inhibition, Unrelenting Standards/Hypercriticalness and Punitiveness significantly predicted higher scores on SCID-PQ BPD symptoms.

Higher scores on subscale of Unrelenting Standards/Hypercriticalness significantly predicted higher scores on SCID-PQ BPD symptoms among depressed inpatients after controlling for the effect of gender, age, education level and employment status, explaining variance independently over the effect of controlled variables. In addition, higher scores on Unrelenting Standards/Hypercriticalness–subscale significantly predicted higher scores on SCID-PQ BPD symptoms after controlling for self-reported current CES-D depressive symptoms, explaining variance independently over the effect of current depressive symptom state, gender, age, education and employment status. All the other significant univariate associations were rendered non-significant after the inclusion of covariates of gender, age, education and employment status in Model 2 and of CES-D depressive symptoms in Model 3.

Next we examined gender interactions of YSQ-S2-extended subscales in predicting BPD symptoms. We found one significant interaction, for Failure to Achieve ( $F(6,18) = 2.84, p = .04$ ). Because the gender- Failure to Achieve interaction turned out significant, the associations between Failure to Achieve and BPD symptomatology were explored for women and men separately. Among men, Failure to Achieve was not associated with SCID-PQ BPD symptoms ( $\beta = -.09, p = .77, 95\% \text{ CI} = -.82, .62$ ). In contrast among women, higher scores on Failure to Achieve was marginally significantly associated with higher scores on SCID-PQ BPD symptoms ( $\beta = .36, p = .054, 95\% \text{ CI} = -.01, .67$ ), even after controlling for



the effect of gender, age, education and employment status ( $\beta = .32$ ,  $p = .052$ , 95% CI = -.00, .59) in Model 2, and CES-D depressive symptoms ( $\beta = .33$   $p = .061$  CI 95% = -.02, .63) in Model 3.

Table 7.

*Regression analysis: Predicting BPD severity with individual EMSs.*

EMS	Model 1				Model 2				Model 3			
	$\beta$	95 % CI	p	R <sup>2</sup> Change	$\beta$	95 % CI	p	R <sup>2</sup> Change	$\beta$	95 % CI	p	R <sup>2</sup> Change
ED	-.03	-.35 , .28	.83	.00	-.13	-.43 , .18	.40	.02	-.15	-.44 , .14	.30	.02
AB	.39	.10 , .68	≤.01	.15	.28	-.02 , .58	.07	.07	.21	-.10 , .52	.18	.04
MA	.31	.01 , .61	.04	.10	.25	-.05 , .54	.10	.06	.16	-.15 , .48	.30	.02
DS	.13	-.19 , .44	.42	.02	.06	-.24 , .36	.69	.00	.02	-.28 , .32	.89	.00
SI	.18	-.13 , .49	.25	.03	.03	-.28 , .35	.83	.00	-.08	-.40 , .25	.64	.00
DI	.45	.17 , .73	≤.01	.20	.31	-.04 , .66	.09	.06	.22	-.15 , .59	.23	.03
VH	.29	-.01 , .59	.06	.08	.24	-.06 , .55	.12	.05	.17	-.15 , .48	.30	.02
EM	.34	.04 , .64	.03	.12	.28	-.01 , .57	.06	.07	.20	-.11 , .51	.20	.03
FA	.24	-.07 , .54	.13	.06	.15	-.15 , .45	.32	.02	.09	-.22 , .39	.57	.01
ET	.35	.05 , .64	.02	.12	.22	-.08 , .53	.14	.04	.14	-.19 , .46	.40	.01
IS	-.15	-.46 , .16	.33	.02	-.12	-.42 , .18	.42	.01	-.17	-.46 , .12	.24	.03
SB	.05	-.26 , .37	.74	.00	.04	-.26 , .34	.79	.00	-.01	-.31 , .29	.94	.00
SS	.02	-.30 , .33	.91	.00	-.00	-.30 , .30	.99	.00	-.10	-.40 , .21	.53	.01
AS	.34	.04 , .64	.03	.12	.29	-.01 , .58	.05	.08	.23	-.07 , .53	.12	.05
NP	.36	.07 , .66	.02	.13	.30	-.01 , .61	.06	.07	.24	-.08 , .56	.14	.04
EI	.33	.04 , .63	.03	.11	.27	-.03 , .57	.08	.07	.18	-.15 , .51	.28	.02
US	.55	.28 , .81	≤.001	.30	.51	.21 , .82	≤.001	.19	.47	.12 , .82	.01	.12
PU	.31	.01 , .61	.04	.10	.22	-.08 , .52	.15	.04	.12	-.20 , .45	.44	.01

ED=Emotional Deprivation, AB=Abandonment/Instability, MA=Mistrust/Abuse, DS=Defectiveness/Shame, SI=Social Isolation/Alienation, DI=Dependence/Incompetence, VH=Vulnerability to Harm or Illness, EM=Enmeshment/Undeveloped Self, FA=Failure to Achieve, ET=Entitlement/Grandiosity, IS=Insufficient Self-Control/Self-Discipline, SB=Subjugation, SS=Self-Sacrifice, AS=Approval-Seeking/Recognition-Seeking, NP=Negativity/Pessimism, EI=Emotional Inhibition, US=Unrelenting Standards/Hypercriticalness, PU=Punitiveness,

Model 1: Predicting SCID-PQ total score with individual YSQ-subcales.

Model 2: Predicting SCID-PQ total score with individual YSQ subscales. Gender, age, education and employment status added as covariates.

Model 3: Predicting SCID-PQ total score with individual YSQ-subcales. Gender, age, education and employment status and CES-D depressive symptoms added as covariates.

## 5. Discussion and Conclusions

The present study findings bring new insight into the field of research interested in the phenomena of comorbidity, and relates YSQ-S2-extended EMSs to self-reported BPD symptomatology and symptom severity among currently depressed individuals. The results of the present study indicated that ten of the 18 EMSs reflecting maladaptive cognitive core beliefs were positively associated with self-reported BPD symptoms among depressed inpatients. One of the 18 EMSs, Unrelenting Standards and Hypercriticalness, was strongly and uniquely associated with elevated BPD symptomatology and symptom severity even after controlling for the effect of current depressive symptomatology, gender, age, education level and employment status, emphasizing its possible role as a specific vulnerability factor for elevated risk for comorbid BPD symptomatology among severely ill depressed individuals.

### *5.1. The Associations Between EMSs and BPD Symptomatology and Symptom Severity*

The first aim of the present study was to explore if EMSs are associated with self-reported BPD symptomatology and symptom severity among currently depressed adult inpatients. Higher scores on Abandonment and Instability, Dependence and Incompetence, Mistrust and Abuse, Enmeshment and Undeveloped Self, Entitlement and Grandiosity, Approval-seeking and Recognition-seeking, Negativity and Pessimism, Emotional Inhibition, Punitiveness and Unrelenting Standards and Hypercriticalness were all positively associated with the self-reported BPD symptomatology and symptom severity among currently depressed inpatients.

In concordance with the previous literature, according to the present findings, Enmeshment and Undeveloped Self, Mistrust and Abuse, Emotional Inhibition and Unrelenting Standards and Hypercriticalness were all positively associated with elevated BPD symptomatology and symptom severity among currently depressed individuals. In previous literature, Mistrust and Abuse, Enmeshment and Undeveloped Self, Emotional Inhibition and Unrelenting Standards and Hypercriticalness have all been shown to be associated with BPD symptomatology and symptom severity (Ball & Cecero 2001; Lawrence et al., 2011; Nilsson

et al., 2010; Nordahl et al., 2005; Reeves & Taylor 2007), but not with depressive symptomatology and symptom severity (Calvete et al., 2005; Harris & Curtin 2002; Renner et al., 2012; Schmidt et al., 1995; Shah & Waller 2000; VanVlierberghe et al., 2010; Wright et al., 2009), except for the results of Welburn and colleagues (2002). Enmeshment and Undeveloped Self, Mistrust and Abuse, Emotional Inhibition, and Unrelenting Standards and Hypercriticalness all relate to rigidities in interpersonal relationships and difficulties in affect regulation, emotional expression and regulating social distance (Young et al., 2003), which are some of the key characteristics of BPD pathology but not the center of MDD pathology (APA 2013). Therefore these EMSs may reflect more specific cognitive core vulnerabilities for BPD, and act as trait-like risk factors for elevated BPD symptomatology and symptom severity among currently depressed individuals, but this needs to be further researched.

According to our results, Abandonment and Instability and Dependence and Incompetence were positively associated with elevated BPD symptomatology among currently depressed inpatients, which is partly in contradiction with the previous literature. In previous research, Abandonment and Instability and Dependence and Incompetence have been related to both BPD and depressive symptomatology and symptom severity (Ball & Cecero 2001; Harris & Curtin 2002; Jovev & Jackson 2004; Lawrence et al., 2011; Nilsson et al., 2010; Nordahl et al., 2005; Reeves & Taylor 2007; Renner et al., 2012; Schmidt et al., 1995; VanVlierberghe et al., 2010; Welburn et al., 2002), suggesting that Abandonment and Instability and Dependence and Incompetence would potentially reflect shared features common for both BPD and MDD. Abandonment and Instability and Dependence and Incompetence both reflect themes related to individual's fear of abandonment and need to interact with other people. Themes reflecting feelings of loneliness and emptiness, and incapability of being alone are characteristic for both BPD and MDD; the sense of worthlessness and difficulties in independent decision-making are essential features of MDD, while the overvalued ideas of being bad and profound fear of abandonment closely relates to BPD hallmarks (APA 2013). However, according to the present findings, Abandonment and Instability and Dependence and Incompetence were positively associated with elevated BPD symptomatology among depressed inpatients, suggesting that in depressed patient population demanding hospitalization, Abandonment and Instability and Dependence and Incompetence may relate to BPD symptomatology to a larger extent. It has to be noted, that previous research is based on student and outpatient populations, not on patient populations

demanding hospitalization. Moreover, previous literature has not focused on the associations between Abandonment and Instability and Dependence and Incompetence and comorbid BPD symptomatology in depressed population, but has studied the associations separately, which may partly explain the emerged discrepancy. In future research, it would be fruitful to further investigate how Abandonment and Instability and Dependence and Incompetence relate to BPD symptomatology in different clinical populations.

Another interesting contradiction emerged between our results and the previous literature in relation to Enmeshment and Undeveloped Self: According to our results Enmeshment and Undeveloped Self was positively associated with elevated BPD symptomatology and symptom severity among depressed inpatients. However, previous studies have found no association between Enmeshment and Undeveloped Self and BPD pathology in clinical outpatient populations (Ball & Cecero 2001; Lawrence et al., 2011; Nordahl et al., 2005), except for Nilsson and colleagues (2010). Our results are also in contradiction with the findings of Reeves and Taylor (2007), according to which Enmeshment and Undeveloped Self was negatively associated with BPD pathology. Nonetheless, the results of Reeves and Taylor (2007) are limited to non-clinical young adults, who may differ from our adult inpatient population in many ways. Enmeshment and Undeveloped Self reflects poorly defined sense of self, feelings of emptiness and lack of direction, and relates to excessive emotional involvement and closeness with significant others (Young et al., 2003). The unstable sense of self and resulting lack of direction, chronic feelings of emptiness and excessively intense relationships are some of the key characteristics of BPD pathology as well (APA 2013). Reeves and Taylor (2007) concluded, that a potential explanation for their somewhat surprising finding may have been, that even Enmeshment and Undeveloped Self often refers to underdeveloped individualization and is typically characterized by excessive connection with others, especially parents, students who were more involved with their parents may actually have received more social support.

The aforementioned contradiction between clinical populations is interesting. It may be that compared with healthier outpatients, among depressed inpatients Enmeshment and Undeveloped Self may potentially reflect poor individuation and social development to a larger extent, affecting individual's functional capability to a significant degree leading to a need for hospitalization. In future research it would be fruitful to further investigate if Enmeshment and Undeveloped Self may act as "a pointer"-vulnerability factor for BPD pathology associating negatively with the risk for BPD symptomatology in healthy

population, potentially reflecting supportive characteristics of social environment rather than poor development of self, and not significantly associating with BPD pathology among less severely ill patients, but indicating heightened risk for elevated BPD symptomatology and symptom severity among severely ill patients, potentially reflecting characteristics with emphasis on the poor development of the self. According to the results of the present study, Enmeshment and Undeveloped Self may potentially act as a specific cognitive risk factor for elevated BPD symptomatology and symptom severity among severely ill depressed inpatients, but further research is needed on this topic based on both in- and outpatient populations.

In the present study, higher scores on Entitlement and Grandiosity, Approval-Seeking and Recognition-Seeking, Punitiveness and Negativity and Pessimism were all positively associated with elevated BPD symptomatology and symptom severity among currently depressed inpatients. Previous literature has not linked these EMSs to either BPD or MDD symptomatology, except for Nilsson and colleagues (2010). The previous lack of the associations may potentially be due to the methodology; except for Nilsson and colleagues (2010), previous research have utilized prior forms of schema questionnaires that do not contain the EMSs of Approval-Seeking and Recognition-Seeking, Negativity and Pessimism and Punitiveness. Another explanation may be that Approval-Seeking and Recognition-Seeking, Entitlement and Grandiosity, Punitiveness and Negativity and Pessimism are overemphasized among depressed patients demanding hospitalization who have an increased risk for comorbid BPD symptomatology and elevated symptom severity.

Negativity and Pessimism is associated with chronic worry of life and relates to a pervasive focus on the negative aspects of life (Young et al., 2003). Hopelessness and pessimistic views of life are themes that characterize both BPD and MDD and are often overemphasized during hospitalization. Approval-Seeking and Recognition-Seeking refers to excessive emphasis on gaining approval, recognition and attention from other people at the expense of a true sense of the self. Self-esteem is dependent primarily on the reactions of others rather than individual's own inclinations, which often results in hypersensitivity to rejection (Young et al., 2003). Hypersensitivity to rejection and perceived abandonment, difficulties with the identity and self and reactivity in terms of interaction with other people are some of the hallmarks for BPD pathology as well (APA 2013), which may partly explain the emerged association found in the present study. Slightly oppositely to Approval-Seeking and Recognition-Seeking, Entitlement and Grandiosity reflects beliefs that individual is superior

to other people and Punitiveness relates to difficulties in allowing human imperfection and is often characterized by tendency to be angry, intolerant, and punitive with the people who do not meet the expectations of an individual (Young et al., 2003). BPD patients are typically prone to have difficulties in appropriate expression of anger and other intense negative emotions, and interpersonal relationships are often characterized by alternating themes of idealization and devaluation, resulting in somewhat sudden and often dramatic shifts from one interpersonally reactive mood-state to another (APA 2013; Lieb et al., 2004), linking Entitlement and Grandiosity and Punitiveness adequately to core features of BPD. In future research, it would be fruitful to further investigate, if different EMSs are associated with specific BPD features among different populations.

Another interesting contradiction emerged between our results and the previous literature: Somewhat unexpectedly, in contrast to the results of Lawrence and colleagues (2011), we found no significant association between Vulnerability to Harm or Illness, Subjugation, Self-Sacrifice and BPD symptomatology and symptom severity among depressed inpatients. Vulnerability to Harm or Illness and Self-Sacrifice have both been previously associated with MDD symptomatology and symptom severity (Calvete et al., 2005; Harris & Curtin 2002; Shah & Waller 2000; Wright et al., 2009), which may partly explain the associations found in the study of Lawrence and colleagues (2011). It also may be that in terms of EMS endorsement, depressed adult inpatients may significantly differ from young patients with BPD at the early phase of the disease. In comparison to the methodological choices of Lawrence and colleagues (2011), the strengths of the present study were the symptomatology-based analyzes with respect to the sample size, attention to the inter-correlative nature of EMSs and use of the current depressive symptomatology and other potentially confounding variables as covariates.

Interestingly, according to our results, Failure to Achieve was marginally positively associated with BPD symptomatology and symptom severity among depressed female inpatients, even over the effect of the current depressive symptomatology, but was not associated with BPD symptomatology among depressed male inpatients. In previous literature Failure to Achieve has consistently been linked with depressive symptomatology and symptom severity (Calvete et al., 2005; Renner et al., 2012; VanVlierberghe et al., 2010; Welburn et al., 2002), but not with BPD symptomatology (Ball & Cecero 2001; Jovev & Jackson 2004; Nordahl et al., 2005; Reeves & Taylor 2007). However, our results are in line with the results of Lawrence and colleagues (2011) and Nilsson and colleagues (2011),

according to which Failure to Achieve was associated with BPD symptomatology among female BPD patients. The marginal association between Failure to Achieve and BPD symptomatology and symptom severity may be due to a coincidence or method artifact. Another explanation may be, that depressed female inpatients may actually differ from male inpatients in terms of cognitive core vulnerability factors related to BPD symptomatology, but this needs to be further researched.

### *5.2. The Associations Between the EMSs and BPD Symptomatology and Symptom Severity Over Sociodemographic Covariates and the Current Depressive Symptomatology*

The second aim of the present study was to explore if EMSs are associated with BPD symptomatology and symptom severity among depressed inpatients over the sociodemographic covariates and the current depressive symptomatology. Indeed, Unrelenting Standards and Hypercriticalness was independently positively associated with elevated self-reported BPD symptomatology explaining 12% of the variance over the effect of current depressive symptom state, gender, age, education and employment status. In contrast, the associations to all other EMSs were rendered non-significant after the addition of the aforementioned covariates.

The association between Unrelenting Standards and Hypercriticalness and BPD symptomatology and symptom severity has not emerged in previous literature (Ball & Cecero 2001; Jovev & Jackson 2004; Lawrence et al., 2011; Nordahl et al., 2005; Reeves & Taylor 2007), except for the results of Nilsson and colleagues (2010) according to which all the 18 EMSs were positively associated with BPD. Similarly, no consistent link between Unrelenting Standards and Hypercriticalness and depressive symptomatology and symptom severity has been reported (Calvete et al., 2005; Harris & Curtin 2002; Schmidt et al., 1995; Shah & Waller 2000; VanVlierberghe et al., 2010; Wright et al., 2009) except for the results of Welburn and colleagues (2002) according to which Unrelenting Standards and Hypercriticalness was positively associated with elevated depressive symptomatology.

Somewhat surprisingly, controlling the effect of gender, age, education and employment status extinguished the emerged associations between all other nine EMSs and BPD symptomatology in the present study. Previous studies focusing on the associations between EMSs and BPD symptomatology have controlled for the effect of potentially confounding



variables inconsistently. Generally, in previous studies the effect of gender (Lawrence et al., 2011; Nordahl et al., 2005; Reeves & Taylor 2007; Rijkeboer et al., 2005) and age (Nilsson et al., 2010; Nordahl et al., 2005; Rijkeboer et al., 2005) have most consistently been taken into account in relation to the associations of interest. In contrast, none of the previous studies have considered the effect of current employment status, and only Rijkeboer and colleagues (2005) paid attention to the effect of education on the associations between EMSs and BPD pathology. None of the aforementioned studies have controlled for all of the variables controlled in the present study at the same time. This may potentially shed light on the emerged discrepancy between our results and the previous literature.

However, according to our results Unrelenting Standards and Hypercriticalness was uniquely associated with the risk for elevated BPD symptomatology and symptom severity among depressed individuals, over and beyond the effect of current depressive symptom state and aforementioned covariates. Unrelenting Standards and Hypercriticalness reflects very high internal standards and hypercriticalness towards the self and others, usually to avoid feelings of shame or disapproval by others. It is often experienced as excessive questioning of self and others and is typically present as perfectionism and rigid rules in different areas of life (Young et al., 2003). Thought suppression has been shown to be associated with BPD symptom severity (Geiger et al., 2013). Unrelenting Standards and Hypercriticalness may reflect individual's attempts to compensate the experienced intra psychic and interpersonal instability, often present in BPD, by developing fixed rules regarding several aspects of life causing distress due to the rigidity of the rules. According to the conclusions of Jovev and Jackson (2004) "Unrelenting Standards and Hypercriticalness may reflect attempts to regulate individuals sense of the self and to change behavior so that it meets the expectations of the environment and thus to avoid rejection", linking Unrelenting Standards and Hypercriticalness to some of the core BPD pathology.

Excessive criticalness towards the self and pursuit of the overly high internal standards may result in intense feelings of hopelessness, serious fatigue and functional decline, and at the extremity even in suicidal tendencies, often present during hospitalization. This may potentially explain the emerged discrepancy between our results and the previous research based on somewhat healthier populations that has not consistently linked Unrelenting Standards and Hypercriticalness to BPD symptomatology.

All things considered, according to the present findings, Unrelenting Standards and Hypercriticalness may potentially act a specific trait-like cognitive risk factor for elevated BPD symptomatology and symptom severity among depressed inpatients, predicting BPD symptom severity over the effect of the current depressive symptom state.

### *5.3. Possible Underlying Mechanisms*

Early adverse life-events have been shown to be associated with both depressive (Cukor & McGinn 2006; Fergusson, Boden, & Horwood 2008; Higgins 2003; Sachs-Ericsson, Kendall-Tackett & Hernandez 2007; Springer, Sheridan, Kuo & Carnes 2007) and BPD symptomatology (Bandelow et al., 2005; Bradley et al., 2005; Liotti & Pasquini 2000) later in life. Early adverse life-events have also been shown to be associated with the greater degree of reported EMSs (Cukor & McGinn 2006). One possible pathway linking early adverse life-events to later psychopathology may relate to implicit memory system developing early in life, formulating and storing intricate rules and prototypes related to repeated exposures to examples in childhood (Baird et al., 2005). Implicit memory system has been hypothesized to be involved in unconscious processing of affective information: "...once learned implicitly, rules may exert a self-perpetuating bias for interpreting later experiences in a light consistent with past experience, whether later experience is objectively consistent with past experience or not" (Baird et al., 2005).

In literature, there are numerous ways to conceptualize the associations between childhood environment and later intra psychic and interpersonal functioning. According to attachment theory (Bowlby 1982, 1988), child forms representations (i.e. "internal working models") of the self, of significant others, and of the self in relation to others, based on the experiences with the primary caregivers. Attachment security can be considered as a key feature of relationships throughout life, and the attachment relationship can be seen as a prototype of later social relationships (Bartholomew & Horowitz 1991; Bowlby 1982). According to schema theory, these latent representations of the self and self in relation to others, developing early in life based on experiences with the significant others, are conceptualized as EMS as described earlier. According to the conclusions of Simard, Moss and Pascuzzo (2011) there are lots of similarities in EMSs and internal working models reflecting attachment: "Both are mental, affect-laden structures that develop from dysfunctional early

interactions with primary care givers, and serve as templates for the processes involving the self and others thorough out the life span”. However, they concluded that EMSs “may act as the cognitive expression for the affect, based on a working model of interactions with others, influenced by but not limited to the affectional bonds to which attachment refers”.

Insecure attachment characteristics have been shown to be associated with both depressive (Bifulco, Moran, Ball & Bernazzani 2002; Muris, Meesters, Melick & Zwambag 2001; West & George 2002) and BPD symptomatology (Agrawal et al., 2004; Fonagy, Target & Gergely 2000; Minzenberg et al., 2006), as well as greater degree of reported EMSs (Mason, Platts & Tyson 2005; Simard et al., 2011). EMSs have been shown to mediate the association between early adverse life-events and later interpersonal difficulties and psychopathology (Cukor & McGinn 2006; Lumley & Harkness 2007; Messman-Moore & Coates 2007; Specht et al., 2009). In concordance, EMSs have also been shown to either fully or partly mediate the associations between attachment and symptoms of psychopathology (Bosmans, Braet & Van Vlierberghe 2010), perceptions of parenting and depression (Harris & Curtin 2002; Shah & Waller 2000) as well as perceptions of parenting and symptoms of cluster B personality disorders (Thimm 2010). In general, results on the mediating associations of EMSs are still quite sparse and can be considered as somewhat preliminary.

However, more specifically, Emotional Deprivation, Social Isolation and Alienation (Cukor & McGinn 2006; Lumley & Harkness 2007), Defectiveness and Shame, Mistrust and Abuse, Abandonment and Instability (Cukor & McGinn 2006), and Self-Sacrifice (Lumley & Harkness 2007) have been shown to mediate the association between childhood adversity and depressive symptomatology. In turn, Vulnerability to Harm or Illness (Harris & Curtin 2002; Shah & Waller 2000), Defectiveness and Shame, Insufficient Self-Control and Self-Discipline, Incompetence and Inferiority (Harris & Curtin 2002), Dependence and Incompetence, Emotional Inhibition, Failure to Achieve, and Unrelenting Standards and Hypercriticalness (Shah & Waller 2000) have been shown to partly mediate the link between perceived parenting and depressive symptomatology.

Generally, the results focusing on the mediating associations of EMSs between childhood environmental characteristics and BPD symptomatology later in life are more consistent compared with the results regarding the associations in relation to depressive symptomatology. Mistrust and Abuse, Abandonment and Instability and Defectiveness and Shame have been shown to mediate or partly mediate the association between psychological

abuse and later interpersonal problems (Messman-Moore & Coates 2007), typically present in BPD. In concordance, EMSs of Abandonment and Instability, Mistrust and Abuse, Emotional Deprivation, Defectiveness and Shame and Social Isolation and Alienation grouped together, and Entitlement and Grandiosity and Insufficient Self-control and Self-Discipline grouped together have been shown to mediate the relationship between childhood maltreatment and BPD symptomatology (Specht et al., 2009) and perceptions of parenting and symptoms of cluster B personality disorders (Thimm 2010).

To sum, the abovementioned findings suggest that the effects of childhood adversity and dysfunctional early environment potentially persist via EMSs later in life. The EMSs mediating the associations between depressive and BPD symptomatology and childhood environmental characteristics may partly be the same but partly different. EMSs reflecting expectations that individual's needs for safety and stability will not be met by others in an adequate and predictable manner, seem to be linked to both depressive and BPD symptomatology and their relation to childhood environmental characteristics. In contrast, EMSs reflecting themes related to deficiencies in internal limits and responsibility to others, seem to mediate the associations between BPD symptomatology and childhood environmental characteristics, but not relate to depressive symptomatology.

This may potentially shed light on our results as well. From dysfunctional cognitive processes, especially anger rumination has been shown to be associated with BPD features and BPD feature severity (Geiger et al., 2013), and indeed, emotional dysregulation is one of the key-characteristics of BPD, BPD patients typically experiencing a wide range of intense negative emotions (APA 2013). According to our results, Unrelenting Standards and Hypercriticalness was independently associated with elevated BPD symptomatology and symptom severity among depressed inpatients, over the effect of the current depressive state. It may be that in our inpatient sample, the fixed and inflexible rules in different areas of life, characterizing Unrelenting Standards and Hypercriticalness, may actually reflect deficiencies in internal limits, resulting in the rigidity of the rules as compensation. Thus, it may be that EMSs reflecting deficiencies and rigidities in internal limits may act as specific cognitive vulnerability factors for BPD. In future research it would be fruitful to further investigate, if Unrelenting Standards and Hypercriticalness may act as a linking bridge between early environmental characteristics and later BPD symptomatology among depressed individuals.

#### *5.4. The Advantages and the Limitations of the Present Study*

The present study provides new information on the associations between cognitive core vulnerability factors and BPD symptomatology among currently depressed individuals, expanding the existing literature towards the phenomena of comorbidity. Although the cognitive processes are widely recognized as a core component in the definition of personality disorders (APA 2013), the present study is one of the first to focus on the associations between EMSs and BPD symptomatology and symptom severity occurring together with depression. Previous research in this field has focused on the associations between EMSs and BPD or EMSs and depression separately. More specifically, this study is the first to predict the risk for the present BPD symptomatology and symptom severity in depressed patient population by emerged EMS occurrence. In addition, to the best of my knowledge, the present study is the first to assess the associations between EMSs and BPD symptomatology and symptom severity among severely ill patient population demanding hospitalization. The previous research is based on either healthy student populations or outpatient populations, leaving more severely ill psychiatric patients overshadowed. We have shed preliminary light to this field of research and shown that EMSs may have some validity in predicting the risk for the elevated BPD symptomatology and symptom severity among depressed inpatients, even over the current depressive symptom state. Further research is needed to comprehensively understand how cognitions relate to the development and maintenance of BPD symptomatology and symptom severity over and below the clinical cutoff, but also in different clinical populations.

In clinical practice, the comorbidity of BPD and MDD is a well-known challenge, complicating the treatment and affecting the prognosis of the treatment (Grilo et al., 2005; Skodol et al., 2002; Skodol et al., 1999; Zanarini et al., 1998; Zimmerman et al., 2005). Societal costs of BPD are high and BPD patients tend to require a good few of the mental-health care resources (Ansell et al., 2007; Asselt et al., 2007; Frankenburg & Zanarini 2004; Lieb et al., 2004). Hence, early identification of BPD is critically important in terms of treatment. In practice, BPD diagnosis is based on a doctor's comprehensive assessment and clinical judgement, which is a time and resource demanding process. There are two major clinical implications of the present study: Firstly, EMSs increase the understanding of the psychological content related to the patient's unique underlying cognitive core vulnerability themes, which may be useful in effective treatment planning and implementation especially

in complicated cases characterized by comorbidity of two or more psychiatric disorders. Secondly, according to our results, EMSs assessed via YSQ-S2-extended self-report questionnaire predict the risk for present BPD symptomatology and elevated symptom severity among depressed inpatients, and may thus be helpful in human resources prioritizing and effective treatment targeting from the early phase of treatment onwards in psychiatric wards.

There are several methodological strengths of the present study. First, from a more dimensional approach on the assessment of personality pathology, we focused on symptomatology-based perspective for BPD pathology by rather assessing the risk for elevated BPD symptomatology and symptom severity than making group comparisons based on small subgroups and somewhat arbitrary cutoffs. Our approach is in line with the suggestions of Clarkin and Huprich (2011) according to which to meet the expectations of clinical relevance and utility, personality disorder assessment should be expanded with individuals own conceptions of the self and others. Second, we paid attention to the emerged factor structure and the inter-correlations of EMSs, and performed the analyses separately for each EMS as a result. Third, we took into account the potentially confounding factors and controlled the effect of sociodemographic variables such as gender, age, education-level and employment status and used them as covariates when performing the analyses. Fourth, we examined the gender-EMS interactions, and performed the analyses separately for men and women when significant interactions emerged.

However, the limitations of the generalizability of the present cross-sectional findings need to be highlighted. Our relatively small sample comprised of adult inpatients, approximately two thirds of the participants were women and the present study lacked a healthy and a clinical control group. In the current study we relied on self-report questionnaires on the assessment of psychopathology and core cognitive vulnerabilities, which may increase the possibility of shared method variance influencing the results. The higher-order schema domain structure presented by Young and colleagues (2003) did not emerge in our sample, and thus we were not able to investigate the associations between higher-order schema domains and BPD symptomatology. Further research is also needed to assess the longitudinal associations between EMSs and BPD symptomatology and symptom severity among depressed patient population. Future research should rely on structured or semi-structured clinical interviews to comprehensively and reliably assess personality pathology among depressed individuals. Future research is suggested to utilize the latest form of YSQ

to investigate the associations between all 18 EMSs and BPD symptomatology, to pay attention to the gender distribution in sampling and to include referred and non-referred participants to reliably assess the associations between underlying cognitive core vulnerability factors and BPD pathology.

### *5.5. In Summary*

The present findings expand the existing literature by investigating the associations between EMSs and BPD symptomatology among depressed patient population demanding hospitalization. Higher scores on Abandonment and Instability, Dependence and Incompetence, Mistrust and Abuse, Enmeshment and Undeveloped Self, Entitlement and Grandiosity, Approval-Seeking and Recognition-Seeking, Negativity and Pessimism, Emotional Inhibition, Punitiveness and Unrelenting Standards and Hypercriticalness were all significantly positively associated with elevated self-reported BPD symptomatology and symptom severity among currently depressed inpatients. However, only Unrelenting Standards and Hypercriticalness was independently positively associated with self-reported BPD symptomatology and symptom severity among depressed inpatients, explaining variance in BPD symptomatology over the effect of current depressive symptom state and sociodemographic covariates. The results of the present study suggest that Unrelenting Standards and Hypercriticalness may reflect a specific trait-like cognitive risk factor for elevated BPD symptomatology and symptom severity among currently depressed individuals.

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## Appendix

*Cronbach's  $\alpha$  for the YSQ-S2 extended subscales in the present study, the results of Saariaho and colleagues (2009) presented as a reference.*

YSQ–S2 subscale	The current study	Saariaho et al., (2009)	Saariaho et al., (2009) healthy
	inpatients (n=43)	chronic pain patients (n=271)	controls (n=331)
Emotional Deprivation	0.91	0.92	0.91
Abandonment/Instability	0.89	0.91	0.84
Mistrust/Abuse	0.87	0.89	0.83
Social Isolation/Alienation	0.90	0.94	0.88
Defectiveness/Shame	0.92	0.94	0.94
Failure	0.95	0.94	0.93
Dependence/Incompetence	0.76	0.86	0.85
Vulnerability to Harm or Illness	0.77	0.87	0.86
Enmeshment/Undeveloped self	0.80	0.84	0.85
Subjugation	0.78	0.89	0.85
Self-Sacrifice	0.87	0.83	0.84
Emotional Inhibition	0.92	0.88	0.91
Unrelenting Standards/Hypercriticalness	0.86	0.83	0.85
Entitlement/Grandiosity	0.80	0.81	0.82
Insufficient Self-Control/Self- Discipline	0.82	0.89	0.84
Approval-Seeking/ Recognition- Seeking	0.74	0.79	0.84