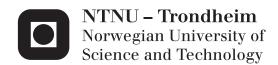Jens C. Thimm

A study of the associations between early maladaptive schemas, developmental task resolution, and personality traits in a psychiatric outpatient sample

Thesis for the degree of Philosophiae Doctor

Trondheim, June 2011

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1. GENERAL AIMS OF THE STUDY

Many individuals seeking psychological treatment experience problems related to their personality (Zimmermann, Rothschild, & Chelminski, 2005). They often struggle with recurrent themes in their lives such as abusive relationships, problems at work, or loneliness, making them vulnerable to recurrent or chronic depression or anxiety.

Cognitive therapy is a psychological treatment that focuses on how individuals construe themselves and their worlds. The cognitive treatment approach has shown to be effective for a wide variety of clinical problems (e.g., Epp & Dobson, 2010). However, Young (1990) observed that clients with personality-related problems frequently do not benefit from traditional cognitive therapy which is typically short-term and problem-focused. They often present vaguely defined problems, avoid painful thoughts and feelings, lack psychological flexibility, and have interpersonal problems that affect the therapeutic relationship (Young, 1990).

Accordingly, Young (1990) modified Beck's standard cognitive therapy (e.g., Beck, Rush, Shaw, & Emery, 1979), integrating concepts from different psychotherapy approaches (e.g., Gestalt therapy, psychodynamic therapies) to treat these patients. Drawing on Beck's (1967) notion of cognitive schemas, Young (1990) introduced in his treatment approach (schema therapy; ST) the concept of early maladaptive schemas (EMSs) as the main target of schema-focused therapy.

Young (1990) defined EMSs as life themes which have their origins in internalized representations of early adverse relationship experiences, operate on the deepest level of cognition, and guide the perception and interpretation of life events relevant to the schema. Young (1990) believes that personality-related pathology is preferably treated with a focus on early childhood experiences.

Schema therapy is considered a major contribution to the field of psychotherapy (Cecero, Nelson, & Gilie, 2004). In particular, Young's listing of EMSs and the inventories for their assessment are widely used by clinicians, but practice of ST has also been met with critique (James, 2001).

When planning the current study in 2002/2003, knowledge about EMSs derived from empirical investigations was relatively limited. Since then, a number of studies have been published relating EMSs to a broad range of different psychological phenomena. More importantly, randomized-controlled trials of ST have been conducted (Farrell, Shaw, & Webber, 2009; Giesen-Bloo et al., 2006) suggesting that ST is an effective treatment.

However, effectiveness is not sufficient to demonstrate the validity of the theoretical basis of a treatment approach. To that aim, empirical research is needed that tests specific hypotheses derived from the theory (Pretzer & Beck, 2004).

The focus of the current study is on the conceptual model of ST. Its aim is to add to the nomological network surrounding the concept of EMSs by examining how EMSs are related to the resolution of psychosocial developmental tasks and personality traits, as well as the mediating role of EMSs between recollections of parental rearing style and symptoms of personality disorders.

2. BACKGROUND

2.1 Schema theory in cognitive psychology

Historically, the concept of schemas can be traced back to the German philosopher I. Kant (Dahlin, 2001; Pace, 1988; Stein & Young, 1992). In the context of the debate about the origins of valid knowledge, Kant overcame the antinomy of rationalism (knowledge is a result of reason) and empiricism (sense experiences provide knowledge) by arguing that knowledge is the product of raw sensory impressions transformed by a priori categories of thinking, some of which are innate (e.g., cause and effect) (Pace, 1988): "This representation of a universal procedure of the imagination in providing an image for a concept, I entitle the schema of a concept" (cited in Stein, 1992).

In psychology, the schema concept was introduced by Bartlett in the 1930s (Singer & Salovey, 1991; Stein, 1992). In his studies, Bartlett found consistent distortions when individuals recalled patterns of narratives. To explain this finding, he used the concept of schemas. Bartlett described schemas as a component of memory, built in the interaction with the environment, and organizing new information (Stein, 1992). The concept of schemas was also central to Piaget's theory of cognitive development. Piaget described the development of a child as a process in which innate schemas (e.g., sensorimotor reflexes) interact with the environment. The interaction consists of the processes of accommodation and assimilation producing the development of knowledge in the child (Pace, 1988).

However, it was not before the 1950s that in connection with a fundamental cultural change (the "cognitive revolution") involving an increased attention to the acquisition, storage, and transmission of information and knowledge the concept of schemas found broad interest in psychology (Mahoney, 1991; Mandler, 1992).

As an organizing framework for the cognitive constructs used in different theoretical proposals, Ingram and Kendall (1986) suggested a cognitive taxonomic system. According to this taxonomy, cognition contains four components: structure, propositions, operations, and products. These components are thought to be interrelated and interacting, but conceptually distinct. Ingram and Kendall (1986) define cognitive structure as the "architecture of the system" (p. 11), i.e., the way information is organized and stored. This component comprises constructs as short- and long-term memory or cognitive networks. Cognitive propositions refer to the content of these structures and the information that is stored, i.e., general and abstract (semantic) knowledge, concrete and personal (episodic) knowledge, internally generated information, and stored beliefs. Cognitive operations are the processes involved in

the system, e.g., attention, encoding, and retrieval. Finally, cognitive products are described as the accessible cognitions or thoughts, comprising the results of the operation and interaction of the three other components of which the person is consciously aware (e.g., attributions, images, beliefs). According to the taxonomy of Ingram and Kendall (1986), schemas comprise the categories of cognitive structures and propositions.

Many definitions of a schema and a number of related and overlapping constructs can be found in the literature (Elliott & Lassen, 1997; Segal, 1988; Singer & Salovey, 1991; Stein, 1992). Thorndyke and Hayes-Roth (1979) suggested four assumptions common for different formulations of schemas: 1) a schema represents a prototypical abstraction of the complex concept it represents; 2) schemas are induced from past experiences; 3) a schema can guide the organization of incoming information into clusters of knowledge, and 4) when one of the constituent concepts of a schema is missing in the input, its features can be inferred from "default values" in the schema.

In a similar way, Mandler (1992) defined a schema as a "coherent unit of structured representation that organizes experience" (p. 63). He described cognitive schemas as abstract representations of experiential regularities, ranging from very concrete (representing primitive categorization of perceptual experience) to very abstract (representing very general levels of meaning). According to Mandler (1992), schemas are built up in the course of experience and interaction with the social and physical environment. Expectations develop as a consequence of schemas. Active schemas determine what one is likely to see, hear, and remember.

Winfrey and Goldfried (1986) summarized five major functions of schemas: 1) schemas facilitate the recognition, recall, and comprehension of previously presented material; 2) schemas influence the speed of information processing and problem solving; 3) schemas help to gather information into meaningful and more easily retrieved units; 4) schemas enable the individual to fill in missing information; and 5) schemas provide greater confidence in prediction and decision making.

2.2 Schema theory in clinical psychology: Beck's approach

A major contribution to the employment of the schema concept in clinical science is the cognitive therapy approach by Beck (Stein & Young, 1992). Beck (1964, 1967) developed a diathesis-stress model of depression based on an information-processing approach in which schemas had a central role together with the concepts of the negative triad (negative views of the self, other, and the world) and cognitive errors (e.g., arbitrary inference, personalization) (Beck et al., 1979). Beck's schema theory had been influenced by the writings of Bartlett and

Piaget, but Kelly's (1955) psychology of personal constructs had a particular impact on Beck's formulation of schemas (Weishaar, 1993).

In short, personal construct psychology is based on the philosophical assumption of constructive alternativism: "We assume that all of our present interpretations of the universe are subject to revision or replacement" (Kelly, 1955, p. 15). Kelly argued that individuals build and refine constructs or hypotheses about regularities in their lives to understand their world and anticipate future events. These constructs are idiosyncratic and bipolar and may differ in their range of application, flexibility, and permeability. Personal constructs are interrelated to varying degrees, and it is distinguished between core and peripheral constructs depending on their importance to the construct system of an individual (Kelly, 1955; Hinkle, 2010).

Beck's schema concept is similar to Kelly's description of personal constructs (Beck, Freeman, Davis, & Ass., 2004; Leahy, 1996). However, Beck did not adopt the term personal constructs because he disagreed with the bipolarity of cognitive structures (Weishaar, 1993). In 1967, Beck defined a schema as "a structure for screening, coding, and evaluating the stimuli that impinge on the organism. It is the mode by which the environment is broken down and organized into its many psychologically relevant facets. On the basis of the matrix of schemas, the individual is able to orient himself in relation to time and space and to categorize and interpret his experiences in a meaningful way" (p. 283).

Beck (1964; Kovacs & Beck, 1978) described schemas as latent and relatively enduring underlying cognitive structures developed in childhood (e.g., through the loss of a parent or adverse interactions with parents) that become activated in stressful situations similar to those experienced in childhood, leading to cognitive biases and the cognitive, affective, and behavioral symptoms of depression (Ingram, Miranda, & Segal, 2006). Schemas contain negative self-referent beliefs. A defining characteristic of depressogenic schemas is their rigidity and lack of differentiation (Kovacs & Beck, 1978).

Despite the central role of schemas, other cognitive concepts such as negative automatic thoughts and intermediate beliefs, which are postulated to be influenced by schemas, became initially the main focus of cognitive theory and therapy of depression (Clark, Beck, & Alford, 1999; Dowd & Courchaine, 2002; Riso & McBride, 2007).

However, with the broadening of the cognitive therapy approach to other diagnoses besides depression (personality disorders in particular) and the emergence of a constructivist-developmental trend (Perris, 2000), an "evolution within the revolution" (Mahoney, 1991, p. 90) occurred with an increasing interest in the integration of developmental theory into

cognitive therapy (Leahy, 1995) and deeper levels of cognition (Perris, 2000). Associated with this shift in focus is an emphasis on core (versus peripheral) cognitive processes, self-organizing dynamics, tacit knowledge, top-down (vs. bottom-up) approaches, and second-order (versus first-order) change (e.g., Guidano & Liotti, 1983; Lyddon, 1990; Neimeyer, 1993; Perris, 2000; Safran, Vallis, Segal, & Shaw, 1986).

Accordingly, Beck and colleagues (Alford & Beck, 1997; Beck, 1996; Beck et al., 2004; Clark et al., 1999; Weishaar & Beck, 2006) elaborated on the schema concept, modifying and expanding Beck's original schema theory. Beck (1996) describes shortcomings of his original schema model, including the multiplicity of symptoms in psychological distress.

In Beck's current model, the concept of schemas is embedded in a cognitive theory of personality. Personality is described as grounded in the operation of cognitive, affective, motivational, behavioral, and physiological systems. Each system is composed of schemas. Thus, different categories of schemas are now distinguished: cognitive schemas are responsible for information processing and the assignment of meaning; affective schemas generate feelings; motivational and behavioral schemas deal with the preparation or inhibition of action; physiological schemas involve the activation of the autonomic nervous system, the motor systems, and the sensory systems (Beck, 1996). Specific networks of these schemas are termed modes (Beck, 1996; Clark et al., 1999). Primal modes deal with the achievement of basic evolutionary goals (survival, reproduction). According to Beck and colleagues (Beck et al., 2004; Clark et al., 1999), basic emotions (sadness, elation, fear, anger) and also DSM-IV (APA, 2000) axis-I and axis-II disorders can be described in terms of primal modes that are easily activated (hypervalent) and dominating (prepotent) in clinical disorders and personality disorders but operating on a more continuous basis in personality disorders (Beck et al., 2004). Modes are activated by orienting schemas that are "responsible for a preliminary assignment of meaning based on a matching of environmental features with the various meaning-making organizations and structures of the information processing system" (Clark et al., 1999, p. 95). The conscious control system (e.g., self-appraisals, self-evaluations, self-instructions) is monitoring and able to override the operating modes (Beck et al., 2004).

In contrast to Beck's early schema theory in which a linear relationship between the cognitive system and the other systems was proposed, it is now assumed that all systems act simultaneously in a mode (Weishaar & Beck, 2006).

Beck's schema model emphasizes the content of schemas. Accordingly, the terms "core beliefs" and "schemas" are often used interchangeably (e.g., Padesky, 1994; Weishaar

& Beck, 2006). Two broad sets of core beliefs are distinguished: beliefs associated with helplessness (e.g., "I am inadequate") and beliefs linked with unloveability (e.g., "I am defective") (Beck, 1999). These have qualities such as density, breadth, permeability, and salience and are thought to be based in genetic evolution, temperament, and learning history (Beck et al., 2004).

Research into Beck's cognitive diathesis-stress model of depression has been extensive (Clark et al., 1999; Ingram et al., 2006). Deviant cognitive processes in depression (e.g., selective encoding or attention) have been demonstrated (Clark et al., 1999). Further, depressed individuals report higher levels of dysfunctional beliefs than non-depressed controls. However, studies have consistently shown that the level of dysfunctional attitudes normalizes with remission from depression (Scher, Ingram, & Segal, 2005). To explain these findings, Miranda and Persons (1988) proposed the mood-state dependent hypothesis, which holds that dysfunctional beliefs remain latent and undetectable in vulnerable individuals until activation by negative mood following stressful events. Priming studies, often using a mood induction design, provided support for this hypothesis (Scher et al., 2005). For instance, Miranda, Gross, Persons, and Hahn (1998) found that increased negative mood was associated with increased reports of dysfunctional beliefs in previously depressed women but not in never depressed women (who showed an opposite effect). Furthermore, results of the Segal et al. (2006) study suggest that cognitive reactivity of remitted patients treated for depression predicts risk of relapse within 18 months. Also the proposed role of adverse childhood experiences (e.g., poor parenting, emotional or sexual abuse, insecure attachment) for the development of cognitive vulnerability has found support (Ingram et al., 2006; Scher et al., 2005).

Recently, research of schema content and processes has been extended to other diagnoses than depression, including personality disorders (e.g., Arntz, Dreessen, Schouten, & Weertman, 2004; Dreessen, Arntz, Hendriks, Keune, & van den Hout, 1999; Weertman, Arntz, de Jong, & Rinck, 2008).

However, problems with Beck's focus on schema content (self-referent beliefs) have been pointed out. In terms of Ingram and Kendall's (1986) taxonomy, beliefs are cognitive products (i.e., the result of cognitive structures and processes) and can therefore not be considered equivalent to cognitive structures (Fisher & Wells, 2009). There is a problem of circularity when self-reports are used to validate a concept whose operations are proposed to explain self-reports (Segal, 1988; Wells, 2000). Furthermore, in Beck's theory, the structure of schemas and how they impact thinking are only vaguely addressed (Segal, 1988).

Alternatively, it has been proposed to conceptualize schemas as cognitive structures containing highly interconnected negative self-elements (Segal, 1988). Due to the interconnections, activation of one element increases the accessibility of adjacent elements (Segal, Gemar, Truchon, Guirguis, & Horowitz, 1995). Wells (2000; Fisher & Wells, 2009) suggests that cognitive processes (e.g., attention allocation) guided by metacognitive knowledge (beliefs about meanings of thoughts and rule and plans for processing of information) are more crucial for the understanding and treatment of psychopathology than self-referent beliefs. From this perspective, an alternative explanation of the results of the aforementioned priming studies would be that different response strategies to mood change and not dysfunctional beliefs are activated in vulnerable and non-vulnerable individuals accounting for the observed differences between the groups. These criticisms demonstrate shortcomings of Beck's schema model and may lead to further revisions or refinements of the hypothetical construct of schemas.

2.3 Schema theory: Young's approach

Schema therapy (ST) is an integrative treatment approach developed by J. Young for the treatment of patients with chronic or recurrent personality-related psychological problems who do not benefit from traditional short-term cognitive therapy (Young, 1999). Expanding on Beck's original cognitive therapy (e.g., Beck et al., 1979), ST incorporates elements of cognitive-behavioral, attachment, Gestalt, object relations, constructivist, and psychodynamic psychotherapies (Young, 1999; Young, Klosko, & Weishaar, 2003).

In his approach, Young (1990) draws on Beck's (1967) schema model but defines a specific subset of schemas, which he proposed to be central to the understanding of patients with long-standing personality related problems and termed early maladaptive schemas (EMSs). Schema therapy uses the concept of EMSs as a unifying element on which a theory of personality, psychopathology, and psychotherapy is built. Young and colleagues have presented the theoretical model and treatment approach of schema therapy in a number of publications (e.g., Bricker, Young, & Flanagan, 1993; Martin & Young, 2010; McGinn, Young, & Sanderson, 1995; McGinn & Young, 1996; Kellogg & Young, 2006; Rafaeli, Bernstein, & Young, 2011; Young, 1999; Young & Behary, 1998; Young & Flanagan, 1998; Young & Gluhoski, 1996, 1997; Young et al., 2003; Young & Lindemann, 1992).

2.3.1 Definition and assessment of early maladaptive schemas

The current definition of an EMS is "a broad, pervasive theme or pattern, comprised of memories, emotions, cognitions, and bodily sensations, regarding oneself and one's relationships with others, developed during childhood or adolescence, elaborated throughout one's lifetime and dysfunctional to a significant degree"(Young et al., 2003, p. 7).

In contrast to previous definitions of EMSs (e.g., McGinn et al., 1995; Young & Gluhoski, 1996), maladaptive behaviors are no longer considered part of a schema, but are now theorized to develop as responses to a schema. Furthermore, it is no longer assumed that all EMSs are unconditional (e.g., McGinn & Young, 1996; Young, 1999): there is now a differentiation between unconditional (developed early in life and pervasive) and conditional (formed later and not as powerful) EMSs. Young et al. (2003) note that conditional or compensatory schemas often develop as a response to unconditional schemas. EMSs form the core of an individual's self-concept and cognitive organization and are therefore resistant to change (Bricker et al., 1993). EMSs are assumed to operate on the deepest level of cognition and are typically egosyntonic (Bernstein, 2005). They represent tacit knowledge that is generally outside of awareness but becomes activated in situations relevant to the schema and is then associated with a high level of negative emotion (Young, 1999). EMSs are universal and dimensional in that each person has EMSs to some degree. Thus, EMSs have different levels of severity and pervasiveness.

It is assumed that EMSs are formed during childhood and adolescence. As in Beck et al.'s (2004) cognitive model, innate emotional temperament is postulated to interact with painful childhood experiences in the formation of EMSs. According to Young et al. (2003), the main cause for developing an EMS is that universal core psychological needs of the child (secure attachment, autonomy, freedom to express valid needs and emotions, spontaneity and play, realistic limits) are repeatedly frustrated. When these needs are not met due to ongoing adverse experiences in the nuclear family or, later in life, with peers and the community, the individual is at risk to develop EMSs. Thus, an EMS origins from ongoing negative social interactions, e.g. mistreatment and traumatization, but overprotection may also contribute to the formation of an EMS. EMSs reflect the child's attempts to make sense of these experiences and to adapt to its environment. As a consequence, the child fails to accomplish important psychosocial developmental tasks (e.g., secure attachments). Referring to Erik Erikson's (1950) psychosocial stage model of personality development, Young et al. (2003) state that it may be argued that unsuccessful resolution of a stage leads to EMSs. According to Young et al. (2003), the child's temperament also plays a major role in the development of

schemas since an extreme temperament makes the child more likely to be exposed to aversive parental rearing or may even override an ordinary early environment.

EMSs are thought to be stable and perpetuated later in life even if the circumstances have changed. EMSs have become a part of the individual's identity, and the individual behaves and interprets situations in a way that confirms the schema. In other words, cognitive biases and self-defeating life-patterns maintain and strengthen EMSs, making the individual vulnerable to depression, anxiety, dysfunctional relationships, addiction, and psychosomatic disorders (Young, 1999). EMSs are hypothesized to be at the core of personality disorders and many axis-I disorders, as well as personality-related problems not covered by axis-II in DSM-IV (APA, 2000), e.g., destructive relationships, being perfectionistic, or difficulty with self-esteem, assertiveness or emotional expression (cf. Westen & Arkowitz-Westen, 1998).

The individual may respond to an activated EMS with a characteristic coping style that perpetuates the schema. Young et al. (2003) distinguish between surrendering (give in), avoidance (avoid the activation of the schema), or overcompensation (acting as if the opposite of the schema were true) (cf. Rafaeli et al., 2011).

EMSs are trait-like constructs (Young et al., 2003; Weishaar & Beck, 2006) in that they are proposed to be stable over time. However, an EMS is not necessarily activated at every moment. Therefore, in order to conceptualize an individual's current emotional and cognitive state, Young developed the construct of schema modes. Schema modes are sets of schemas and coping responses that are currently active (Young et al., 2003). The schema mode model aims to account for abrupt shifts in mood and behavior in individuals with severe personality pathology, such as borderline, narcissistic, or antisocial personality disorder (Arntz & van Genderen, 2009; Kellogg & Young, 2006; Lobbestael, Arntz, & Sieswerda, 2005; Young & Flanagan, 1998; Young et al., 2003). Four types of schema modes are distinguished: child modes, dysfunctional coping modes, dysfunctional parent modes, and the healthy adult mode (Young et al., 2003). In contrast to Beck's (1996) notion of modes as specific interconnections of cognitive, affective, behavioral, motivational, and physiological schemas serving primarily evolutionary ends, the emphasis in ST is on the integration/dissociation of modes in the person, describing them more like ego states (Young et al., 2003).

Based on the developmental model and clinical experience, Young and colleagues developed a taxonomy of EMSs that crosscut psychiatric diagnoses. The schema list has undergone several revisions. In the initial schema model (Young, 1990), EMSs were grouped in six domains: instability/disconnection (abandonment, abuse/mistrust, emotional

deprivation), impaired autonomy (functional dependence, vulnerability to harm and illness, enmeshment), undesirability (defectiveness, social undesirability, failure to achieve), restricted self-expression (subjugation, emotional inhibition), restricted gratification (self-sacrifice, unrelenting standards, negativity/pessimism), and impaired limits (entitlement, insufficient self-control).

The current schema list comprises 18 EMSs (briefly described in the appendix) which are categorized in five domains: disconnection and rejection (abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame, social isolation/alienation), impaired autonomy (dependence/incompetence, vulnerability for harm or illness, enmeshment/undeveloped self, failure), impaired limits (entitlement/grandiosity, insufficient self-control/self-discipline), other-directedness (subjugation, self-sacrifice, and approval-seeking/recognition-seeking), and overvigilance and inhibition (negativity/pessimism, emotional inhibition, unrelenting standards, punitiveness). For example, the abandonment schema involves the expectation that close others are unstable or unpredictable and that one finally is abandoned. The emotional inhibition schema refers to the belief that one must inhibit spontaneous feelings in order to avoid negative consequences. The five schema domains reflect the frustration of the emotional needs of a child or the failure to accomplish important psychosocial tasks in childhood. Young et al. (2003) suggest typical family origins of the five schema domains. The family origin of the EMSs of the disconnection and rejection domain is described as rejecting, withholding, unpredictable, or abusive. An enmeshed family that undermines the child's confidence is thought to be the background of the EMSs of the impaired autonomy and performance schema domain. Permissiveness, overindulgence, and lack of direction contribute to the development of the EMSs of the impaired limits domain. With regard to the EMSs of the other-directedness domain, conditional acceptance is suggested to be the family origin. Finally, a grim and demanding family environment is hypothesized to be the origin of the schemas of the overvigilance and inhibition schema domain.

Bernstein (2002) set forth specific hypotheses about the relationships between types of childhood maltreatment, temperamental factors, EMSs, coping styles, and the DSM-IV (APA, 2000) personality disorder categories. For example, he hypothesized that avoidant personality disorder is the result of an anxious or fearful temperament in combination with a rejecting, critical, or socially excluding family that produce defectiveness, social isolation, approval-seeking, and self-sacrifice schemas. The predominant coping style is avoidance. Young and Gluhoski (1996) proposed a schema focused diagnosis of personality disorders consisting of

the assessment of core themes (EMSs), coping styles, emotional disposition (temperament), and global level of functioning.

The concept of EMSs overlaps with the notion of internal working models in attachment theory (Bernstein, 2005; Platts, Tyson, & Mason, 2002; Young et al., 2003). Further, similarities between EMSs and Beck's notion of core beliefs have been highlighted, e.g., an emphasis on verbal representation of schemas and the conceptualization of EMSs as stable and overgeneralized belief structures that impact the selection of information (Riso & McBride, 2007). Therefore, Riso and McBride (2007) conclude that EMSs and core beliefs are so closely related that it is justifiable to use the terms interchangeably. Young et al. (2003) also note that the differences between Young's and Beck's current schema models "are subtle and often reflect differences in emphasis, not fundamental areas of disagreement" (p. 49). However, EMSs are defined more broadly than core beliefs, but thought of as underlying life themes comprising emotions and bodily sensations in addition to cognitions. Thus, Young's schema model does not adopt the distinction between cognitive, affective, and physiological schemas made in Beck's (Beck et al., 2004) current schema theory.

In ST, EMSs are assessed through several self-report questionnaires, a focused life history, imagery exercises, and the therapeutic relationship. As a tool for measuring EMSs, the Young Schema Questionnaire (SQ) has received particular attention. The SQ consists of self-statements that are rated on a six-point scale from "completely untrue of me" to "describes me perfectly". Items cover dysfunctional beliefs (e.g., "I'm unworthy of the love, attention, and respect of others"), symptoms (e.g., "I often feel that I am going to have an anxiety attack"), and maladaptive behaviors (e.g., "In relationships, I let the other person have the upper hand") (cf. Beck et al., 2001).

The first version of the SQ (Young & Brown, 1990) comprised 123 items designed to measure 15 EMSs grouped in three domains: autonomy (dependence, subjugation/lack of individuation, vulnerability to harm and illness, fear of losing self-control), connectedness (emotional deprivation, abandonment/loss, mistrust, social isolation/alienation), and worthiness (defectiveness/unlovability, social undesirability, incompetence/failure, guilt/punishment, shame/embarrassment, unrelenting standards, entitlement/insufficient limits). Only a few studies have published results employing this version (e.g., Mihaescu et al., 1997; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006).

The revised 205-item version of the SQ (Young & Brown, 1999) has been used by far more researchers. It covers 16 EMSs: abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame, social isolation/alienation; dependence/incompetence,

vulnerability to harm or illness, enmeshment/undeveloped self, failure, entitlement/grandiosity, insufficient self-control/self-discipline, subjugation, self-sacrifice, emotional inhibition, unrelenting standards, and social undesirability. Rijkeboer, van den Bergh, and van den Bout (2005) have developed two parallel forms of the SQ.

Mainly for research purposes (Young et al., 2003) a short form of the SQ (SQ-SF) was constructed, consisting of 75 items measuring 15 EMSs. The scales are composed of the five items with the highest loadings on the 15 factors identified in a study on the 205-item SQ (Schmidt, Joiner, Young, & Telch, 1995). In these analyses, the social undesirability schema did not emerge as a separate factor and was therefore removed from the schema list and is not included in the SQ-SF.

Recently, long and short forms of the SQ have been developed which contain the remaining three EMSs from the schema list (approval-seeking/recognition-seeking, negativity/pessimism, punitiveness) not covered by the SQ and SQ-SF. A few studies have used these versions (e.g., Saariaho, Saariaho, Karila, & Joukama, 2009; Trip, 2006; Unoka, Tölgyes, & Czobor, 2007).

With respect to the SQ and SQ-SF, concerns have been raised regarding the groupings of items (all items are presented clustered) and their wordings (all items are positively worded and therefore susceptible to response bias) as well as the reading comprehension level required to complete the inventories (Ball, 2007). In response to these problems, the 75-item Early Maladaptive Schema Questionnaire-Research Version (EMSQ-R) was developed in which items were rewritten to make them more understandable to less educated patients. Item order and scaling direction were varied (Ball, 2007; Cecero et al., 2004).

Recently, inventories for the assessment of EMSs in children based on self-report have been constructed. The Schema Questionnaire for Children (SQC; Stallard & Rayner, 2005; Stallard, 2007) contains 15 items, each designed to measure an EMS. Rijkeboer and de Boo (2010) constructed the Schema Inventory for Children (SIC). Seventy-five items phrased in present tense cover the 15 EMSs of the SQ-SF. In some studies with adolescent participants, age-adjusted versions of the SQ-SF have been used (e.g., Muris, 2006; Simmons, Cooper, Drinkwater, & Stewart, 2006).

Due to the affinity of Beck's and Young's schema models, many of the objections raised against Beck's schema model also apply to Young's conceptualization of EMSs. Although EMSs are defined as broad themes comprising cognitions, emotions, and bodily sensations, there is a focus on cognitive products when assessing EMSs in ST. More importantly, it may be argued that the EMSs are a symptom of psychopathology rather than

its cause. Further, as in Beck's model, it is not specified how EMSs impact information processing. Similarly, the mechanisms of the selection of coping strategies are unclear. The model does not address the question of how schema-driven maladaptive behavior can be distinguished from behavior that does not originate from the operation of schemas. As a consequence, there is a risk of circular argumentation, attributing all maladaptive behaviors to hypothesized underlying schemas. Another shortcoming of Beck's and Young's schema models is the specification of schema development (cf. Leahy, 1995). Despite Young's strong emphasis on the role of inborn temperament and early relational experiences, his schema theory and classification of schemas uses existing knowledge about child development to a relatively small degree.

2.3.2 Reliability and validity of early maladaptive schemas

2.3.2.1 The Schema Questionnaires

When assessing EMSs, almost all research studies, and probably many clinicians, use a form of the Schema Questionnaire. Therefore, it is crucial that the psychometric properties of the different versions of the SQ are investigated and established. Glass and Arnkoff (1997) propose different domains in the evaluation of self-statement measures such as the SQ, including internal consistency, factor analysis, content validity, concurrent validity (e.g., relationships with psychopathology), convergent validity (i.e., significant relationships with conceptually similar measures), discriminant validity, sensitivity to change with treatment, differentiation of groups that are high and low on the construct, and incremental validity with regard to the predictive power beyond personality measures.

Schmidt et al. (1995) were the first to examine the reliability, factor structure, and validity of the 205-item Schema Questionnaire in a large non-clinical sample (1129 graduate students) and 187 outpatients. Using principal component analysis (PCA), varimax rotation, and three criteria for extraction (Kaiser's criterium, Cattell's scree-test, and factor interpretability), 12 of the 16 proposed factors emerged in the student sample. Labels of some factors were slightly altered, e.g., the failure to achieve factor was relabeled incompetence/inferiority. In addition, one not hypothesized factor (fear of losing control, composed of items of the emotional inhibition scale) was observed. The social undesirability, social isolation, subjugation, and entitlement factors failed to emerge. Their items loaded on the remaining factors (social undesirability on defectiveness, social isolation on emotional deprivation, subjugation on dependency, and entitlement on insufficient self-control). Test-

retest reliabilities (3 weeks) of the 13 factors ranged from .50 (vulnerability) to .82 (emotional deprivation) and internal consistencies from .83 (enmeshment) to .96 (defectiveness). In the clinical sample, a PCA produced 15 factors. The social undesirability scale did not emerge as a separate factor. The fear of losing control factor from the student sample was not found in the clinical sample. Schmidt et al. (1995) also conducted a higher-order factor analysis of the student data, yielding three higher order factors that were labeled disconnection (abandonment, defectiveness, emotional deprivation, emotional inhibition, mistrust, fear of losing control), overconnection (dependency, enmeshment, vulnerability, incompetence/inferiority), and exaggerated standards (unrelenting standards, self-sacrifice). The insufficient self-control factor had high loadings on all three higher-order factors. Convergent and discriminant validity of the SQ were investigated using an undergraduate sample (N = 181). Results of correlational and regression analyses showed expected relations of the 13 SQ factors to psychological distress, self-esteem, depression, symptoms of personality disorders, and dysfunctional attitudes.

Lee, Taylor, and Dunn (1999) explored the factor structure of the SQ in a psychiatric outpatient sample (N = 433). In a PCA with varimax rotation, 16 factors emerged accounting for 60% of the variance. Fifteen hypothesized factors were confirmed. The social undesirability factor did not emerge, and the items of emotional inhibition scale loaded on two factors, labeled emotional constriction and fear of loss of control. A higher-factor analysis resulted in a four-factor solution: impaired autonomy (dependency, enmeshment, failure, subjugation, and vulnerability), disconnection (abandonment, defectiveness, emotional deprivation, emotional constriction, mistrust, social isolation), impaired limits (entitlement, fear of loss of control), and overcontrol (self-sacrifice, unrelenting standards). The insufficient self-control factor loaded on impaired autonomy and impaired limits. Examination of scale mean scores and higher-order factor structures in axis-I and axis-II patients revealed that the axis-II group scored higher on all SQ scales except vulnerability and subjugation. There were only minor differences in the factor structure of the SQ between both groups.

Hoffart et al. (2005) investigated the factorial structure of the Norwegian version of the SQ-SF in a large psychiatric sample (N = 1037). A CFA supported a model with 15 correlated factors. Only the insufficient self-control schema was influenced by two higher order factors in the model. Regarding the higher-order factor structure of the SQ-SF, a slightly better fit for Lees et al.'s (1999) four-factor model than Young's (1999) proposed five schema domains, a three-factor model and models including a third order general factor was found.

Second-order factors were highly correlated. The abandonment, self-sacrifice, and emotional inhibition scales showed a high degree of unique variance. Four eight-item scales were constructed to assess the higher-order factors and their predictive validity with respect to cluster C personality disorder traits, agoraphobic avoidance, and symptoms of depression has been demonstrated.

In further exploratory (e.g., Baranoff, Oei, Cho, & Kwon, 2006; Cecero et al., 2004; Lachenal-Chevallet, Mauchand, Cottraux, Bouvard, & Martin, 2006; Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002) and confirmatory (e.g., Calvete, Estevez, Lopez de Arroyabe, & Ruiz, 2005; Rijkeboer & van den Bergh, 2006; Saariaho et al., 2009; Van Vlierberghe, Braet, Bosmans, Rosseel, and Bögels, 2010) factor analyses of the different forms of the SQ in clinical and non-clinical samples, 13 to 16 EMSs emerged. Higher-order factor analyses (e.g., Calvete et al., 2005; Cecero et al., 2004; Eurelings-Bontekoe, Luyten, Ijssennagger, van Vreeswijk, & Koelen, 2010, Muris, 2006; Unoka et al., 2007; Van Vlierberghe et al., 2010) confirmed 3-5 secondary factors. With a few exceptions, the SQ displayed adequate to high internal consistencies and high power in discriminating between clinical and nonclinical groups. The SQ and SQ-SF have shown strong relationships with psychological symptoms (e.g., anxiety, depression, paranoia, and binge eating) (e.g., Glaser, Campbell, Calhoun, Bates, & Petrocelli, 2002; Stopa, Thorne, Waters, & Preston, 2001; Waller, Meyer, & Ohanian; 2001).

Data on the reliability and validity of the Schema Questionnaire for Children and the Schema Inventory for Children have been reported by the respective authors (Stallard & Rayner, 2005; Stallard, 2007; Rijkeboer & de Boo, 2010).

Concerning the convergent validity of EMSs, Wang, Halvorsen, Eisemann, and Waterloo (2010) found high correlations of the SQ scales with dysfunctional attitudes as measured with the DAS (Weissman & Beck, 1978). Calvete et al. (2005) reported significant associations between EMSs and negative automatic thoughts.

Treatment studies suggest that EMSs are sensitive to change. For example, Welburn, Dagg, Coristine, and Pontefract (2000) investigated schema change in 84 patients participating in a 12-week day treatment program. Results showed significant pre-post-test differences in the vulnerability to harm, social alienation, and defectiveness schemas. Roper, Dickson, Tinwell, Booth, and McGuire's (2010) sample comprised an alcohol dependent group (N = 50) and a non-clinical group (N = 50). The clinical group underwent a 3-week period of abstinence and a psycho-educational program. Results showed significant pre-post changes in 13 of 15 EMSs. However, at posttest, levels of half of the EMSs were still

significantly higher than in the non-clinical group. Cockram, Drummond, and Lee (2010) investigated in two studies the role of EMSs in posttraumatic stress disorder (PTSD). Schema-focused treatment resulted in significant changes in all schemas (except for enmeshment) from intake to 3 months follow-up.

In sum, with the exception of the incremental validity of EMSs above measures of personality, most aforementioned issues in the psychometric evaluation of self-statement inventories proposed by Glass and Arnkoff (1997) have been addressed by emprical studies and provided support for the use of the Schema Questionnaires.

2.3.2.2 Development and stability of early maladaptive schemas

Young's schema model (Young et al., 2003) states that EMSs result from an interaction between innate temperament and early detrimental relationship experiences and are relatively stable over time. Several studies have explored the associations between EMSs and recollections of trauma/abuse and perceived parental rearing style. The mediating role of EMSs between remembered adverse childhood experiences and psychopathology has been investigated. In addition, associations between EMSs and adult attachment, temperament, and personality have been examined.

With respect to childhood trauma, Cecero et al. (2004) found in an undergraduate sample that emotional abuse predicted the defectiveness, emotional deprivation, mistrust, and emotional inhibition schemas and emotional neglect the defectiveness and emotional deprivation schemas. Unexpectedly, physical abuse predicted the enmeshment schema negatively. Results of the Cukor and McGinn (2006) study showed that women with a history of abuse had higher mean scores in EMSs of the disconnection domain and entitlement schema than women without a history of abuse or a mild abuse history (N = 48). Further, disconnection mediated between childhood abuse and depression severity. Lumley and Harkness (2007) reported results of a study on childhood adversity, EMSs, and psychopathology in 76 depressed adolescents. Physical abuse was significantly associated with the EMSs of emotional deprivation, failure, and vulnerability and emotional maltreatment with emotional deprivation, dependency, social isolation, failure, vulnerability, subjugation, and self-sacrifice. Moreover, the self-sacrifice and social isolation schemas mediated between childhood adversity and anhedonic symptoms.

Several studies have addressed the associations between recollections of parental rearing and EMSs. Shah and Waller (2000), for example, compared perceived parental rearing behaviors, EMSs, and depression severity in a sample of 60 depressed outpatients and 67

community controls. Three EMSs (defectiveness, self-sacrifice, and insufficient self-control) differentiated between the groups, and five EMSs (dependence, emotional inhibition, failure to achieve, unrelenting standards, and vulnerability to harm) mediated the effects of adverse parenting on depression. Harris and Curtin (2002) investigated the associations between perceptions of parental rearing behavior, EMSs, and symptoms of depression in 194 students. Using the 12 factors from the Schmidt et al. (1995) study, they found that four EMSs predicted BDI-II scores and were correlated with parental rearing style. Parental overprotection and low parental care were related to the defectiveness, and insufficient self-control, and vulnerability to harm schemas. In addition, parental overprotection was associated with the incompetence/inferiority schema. All four EMSs mediated the relationship between remembered parental rearing and depressive symptoms partially. McGinn, Cukor, and Sanderson (2005) investigated in a sample of 55 outpatients the relationships between parental bonding, childhood trauma, schema domains, and symptoms of anxiety and depression. Low maternal and paternal care were found to be significantly associated with the disconnection domain. Maternal overcontrol was correlated with the overvigilance and the other-directedness domain. The trauma total score was significantly associated with three of the five domains (disconnection, impaired autonomy, and impaired limits). Mediation analyses showed that the relationship between childhood abuse and depression was mediated by the disconnection, impaired autonomy, and impaired limits schema domains. Wright, Crawford, and Del Castillo (2009) assessed perceptions of emotional abuse and neglect, parental alcoholism, psychological distress, and EMSs in 301 college students. They found that the vulnerability, self-sacrifice, and defectiveness schemas mediated the relationship between child emotional neglect and adult symptoms of anxiety and depression and the vulnerability to harm and defectiveness schemas mediated the relationship between child emotional neglect and adult symptoms of dissociation.

Muris (2006) assessed EMSs, five-factor model personality dimensions, and parental rearing behavior in 173 adolescents. Parental rejection, control, and anxious rearing and low emotional warmth were related to higher EMSs scores. All EMSs were significantly correlated with neuroticism. The unrelenting standards schema was positively related to extraversion, agreeableness, openness, and conscientiousness. The self-sacrifice schema was positively associated with agreeableness and the vulnerability for harm schema with openness. Regression analyses revealed that neuroticism and parental rearing behaviors contributed uniquely to the prediction of half of the schemas. The remaining schemas were predicted solely by neuroticism. Also Sava (2009) has investigated the relationships between

the five-factor personality dimensions and EMSs using an undergraduate sample. She found that EMSs were predominantly associated with low agreeableness and low emotional stability; the dependence and insufficient self-control schemas were related to low conscientiousness, and the subjugation and unrelenting standards schemas were related to low extraversion and low openness. Halvorsen et al. (2009) reported associations between EMSs and the temperament and character dimensions proposed by Cloninger, Svrakic, and Przybeck (1993) in 23 clinically depressed, 40 previously depressed, and 40 nondepressed individuals. Results showed a high degree of overlap between EMSs and temperament and character dimensions, harm avoidance and self-directedness in particular.

Research on the associations between EMSs and adult attachment style is based on Bartholomew and Horowitz' (1991) four-categorical model of adult attachment resulting from the two dimensions of attachment anxiety and avoidance. Cecero et al. (2004) found that the dismissing style was predicted by the emotional deprivation, abandonment, subjugation, and social isolation schemas, preoccupied attachment by abandonment, and fearful attachment by the mistrust and emotional inhibition schemas. In Mason, Platts, and Tyson's (2005) sample of 72 patients, the fearful and preoccupied groups scored higher on EMSs than the secure and dismissing groups but were themselves not significantly differentiated by EMSs. Recently, Bosmans, Braet, and van Vlierberghe (2010) explored in a sample of 289 students the relationships between dimensions of attachment, schema domains, and psychological distress. Results showed correlations of both attachment dimensions with all five schema domains. Furthermore, support was found for models in which the disconnection and other-directedness domains mediated between attachment anxiety and psychological distress. The disconnection and impaired limits domains were found to mediate the relationships between attachment avoidance and psychological distress partially.

Regarding the relative and absolute long-term stability of EMSs, Riso et al. (2006) reported moderate to good levels of temporal stability over 2.5 to 5 years of the SQ scales in 55 depressed outpatients when controlling for severity of depression and neuroticism, with stability correlations ranging from .43 to .82 (median = .65). Significant mean decreases were found for four EMSs (mistrust, failure, dependence, and self-sacrifice). Blissett and Farrow (2007) results showed with one exception (self-sacrifice) no significant changes in EMSs in 87 women from pregnancy to 12-month post-partum. Recently, Wang et al. (2010) found in their sample of clinically depressed, previously depressed, and never depressed participants (N = 82) significant moderate test-retest correlations (relative stability) for two schema domains (disconnection, impaired limits) and the mistrust, social isolation, social

undesirability, entitlement, and insufficient self-control schemas when controlling for depression severity. Correlations for the impaired autonomy schema domain and the dependence, enmeshment, and subjugation schemas were not significant. The abandonment, mistrust, and emotional inhibition scales of the SQ showed significant mean reductions, indicating low absolute stability.

2.3.2.3 The role of early maladaptive schemas in psychopathology

According to Young's schema model (Young et al. 2003), EMSs predispose an individual to develop psychological problems, first and foremost personality disorders. A number of studies have been published in recent years, relating EMSs cross-sectionally to a broad range of clinical disorders.

Schmidt (1994) was the first to publish associations between personality disorders and EMSs. Summarizing the results of the Schmidt et al. (1995) study, he reported that paranoid personality disorder was associated with mistrust, dependent personality disorder with dependence, borderline personality disorder with insufficient self-control, and obsessive-compulsive personality disorder with unrelenting standards. Subsequently, Ball and Cecero (2001) found in 41 opioid dependent patients who had diagnoses of antisocial, borderline, avoidant, or depressive personality disorder that SCID-II interview symptom counts showed significant correlations between antisocial personality disorder and mistrust, vulnerability, and emotional inhibition, borderline personality disorder and abandonment and mistrust, avoidant personality disorder and subjugation, and depressive personality disorder and mistrust, social isolation, defectiveness, failure, and subjugation. Jovev and Jackson (2004) compared the endorsement of EMSs in 13 patients with borderline, 13 patients with obsessive-compulsive, and 22 patients with avoidant personality disorder not meeting the diagnostic criteria for the two other personality disorders. Results showed that the borderline group had higher scores on the dependency, abandonment, and subjugation schemas than the obsessive-compulsive group and on the EMS of dependency than the avoidant group. Compared to the avoidant group, the obsessive-compulsive group scored higher on the unrelenting standards schema and lower on the abandonment and subjugation schemas. In line with the results of the Lee et al. (1999) study, Nordahl, Holthe, and Haugum (2005) found that outpatients with axis-II diagnoses scored significantly higher on 12 of 15 EMSs than patients with solely axis-I diagnoses. SCID-II symptom counts were correlated with SQ scales in varying degree. Paranoid, borderline, and dependent personality disorder were significantly associated with approximately half of the 15 schemas, whereas antisocial, schizotypal, and

schizoid personality disorders had no significant correlations with EMSs. Finally, Nordahl et al. (2005) reported that schema change in all schemas predicted change in general distress. In order to investigate the specific relationships between EMSs and all DSM-IV personality disorders, Reeves and Taylor (2007) performed hierarchical regression analyses controlling for symptoms of other PDs from the same cluster and all other EMSs in a large non-clinical sample (N = 804). Results showed that EMSs predicted all PD categories. Unexpectedly, there were negative associations between the enmeshment schema and borderline personality disorder symptoms and the social isolation schema and symptoms of paranoid personality disorder. Further studies concerning the associations between EMSs and personality disorders have been conducted by Petrocelli, Glaser, Calhoun, and Campbell (2001), Loper (2003), Sines, Waller, Meyer, and Wigley (2008), Specht, Chapman, and Celluci (2009), Carr and Francis (2010), and Lawrence, Allen, and Chanen (in press). Results of these studies suggest an overlap between EMSs and PDs, but a lack of specificity of EMSs for DSM-IV PD categories has also been observed (e.g., borderline PD, Lawrence et al., in press).

Several studies have investigated the role of EMSs in anxiety disorders. Hedley, Hoffart, and Sexton (2001) tested in 59 patients the role of the vulnerability and dependence schemas in panic disorder with agoraphobia. Cross-lagged panel analyses showed that the vulnerability schema, but not the dependent schema, predicted fear, catastrophic cognitions, and avoidance. In Pinto-Gouveia et al.'s (2006) study, patients with social phobia (n = 62) and other anxiety disorders (n = 41) and a group of non-psychiatric controls (n = 55) completed the 123-item version of the SQ. Individuals with anxiety disorders had higher scores on most EMSs than the control group. EMSs differentiated social phobia from other anxiety disorders (e.g., mistrust, failure). Dutra, Callahan, Forman, Mendelsohn, and Herman (2008) found in 137 chronically traumatized patients significant relationships of EMSs with posttraumatic stress symptoms, dissociation, and suicidality (suicidal ideations, plans, or attempts). In a prospective study (N = 108), Edworthy, Chasey, and Williams (2008) found that the impaired limits schema domain predicted symptoms of PTSD after birth. Recently, Cockram et al. (in press) reported that veterans with PTSD scored significantly higher on 18 EMSs than veterans without PTSD. With respect to obsessive-compulsive disorder, Ataley, Atalay, Karahan, and Caliskan (2008) reported that 45 patients with this diagnosis scored significantly higher than 45 matched controls in 11 of 18 assessed EMSs.

In addition to the Shah and Waller (2000) study, EMSs in patients with a diagnosis of depression have been addressed in several other studies. Riso et al. (2003) compared EMSs in 42 patients with chronic depression, 27 patients with non-chronic major depression, and 24

normal controls. When controlled for depression severity, the group of chronically depressed scored higher on the disconnection, impaired autonomy, and overvigilance schema domains. Hoffart et al. (2005) found that asymptotic previously depressed scored higher on the disconnection and impaired autonomy domains than asymptotic never depressed individuals. Further, Halvorsen, Wang, Eisemann, and Waterloo (2010) report that schema domains predict depression severity (undesirability domain) and depression episodes (impaired limits) after nine years above DAS when controlling for prior depression. In Abela, Auerbach, Sarin, and Lakwadalla's (2009) study, EMSs were assessed using life history approach. After controlling for current depression, the disconnection and overvigilance schema domains were associated with a past history of major depression in 60 students.

The role of EMSs and schema processes in eating disorders has been extensively researched. Waller, Kennerly, and Ohanian (2007) summarize findings and present a schema-focused model of eating disorders. Studies have shown higher levels of EMSs in individuals with eating disorders than normal controls or dieters (Leung & Price, 2007; Waller et al., 2003) but only small differences between different eating disorders (Leung, Waller, & Thomas, 1999). It is unclear whether EMSs are different in eating disorders and depression (Waller, Shah, Ohanian, & Elliott, 2001; Cooper & Hunt 1998). Also obesity has shown to be associated with a higher endorsement of EMSs in adolescents and adults (e.g., Anderson, Rieger, & Caterson, 2006; Van Vlierberghe & Braet, 2007; Van Vlierberghe, Braet, & Goossens, 2009).

With regard to the relationships between EMSs and addiction, Brotchie, Meyer, Copello, Kidney, and Waller (2004) examined EMSs in 97 addicted patients (alcohol, opiates, both) and 87 non-clinical controls. Both groups differed on most EMSs. Within the clinical groups, emotional inhibition differentiated between combined alcohol/opiate abusers and opiate abusers and subjugation and vulnerability to harm differentiated between alcohol abusers and opiate abusers.

In addition to these studies, EMSs in defined groups have been examined, such as sexual abusers (Richardson, 2005), patients with depersonalization disorder (Simeon, Guralnik, Knutelska, and Schmeidler, 2002), and self-mutilators (Castille et al., 2007), and also relationships between EMSs and other behavior problems, such as aggressiveness (Calvete, 2008; Trembley & Dozois, 2009).

Typically, the studies described above have used a cross-sectional design. However, this approach does not rule out the possibility that EMSs are a byproduct of psychopathology. Research on the proposed role of EMSs as a vulnerability factor for the development of

psychological problems is in an early stage. Findings so far suggest that EMSs operate on a more continuous basis and are more easily accessible than dysfunctional attitudes and that the SQ is possibly more sensitive to the cognitive vulnerability of an individual than the DAS. For example, in contrast to studies using the DAS, Hoffart et al. (2005) observed significant differences in EMSs between asymptotic previously depressed and never depressed individuals. In Stopa and Waters' (2005) study, there were only small changes in EMSs after mood induction. Schmidt and Joiner (2004) found support for the hypothesis that the distress level of individuals scoring high on EMSs is less affected by negative life events compared to low scoring individuals.

2.3.2.4 Summary

The Schema Questionnaires have been evaluated in clinical and non-clinical samples in different languages and cultures, yielding highly similar results. With only a few exceptions, scales of the different versions of the Schema Questionnaire have shown to be internally consistent. Results from exploratory and confirmatory factor analyses were largely in line with the postulated structure. Thus, EMSs can be reliably assessed in different samples, supporting the universality and dimensionality of EMSs. Higher order factor analyses tend to yield in student samples three and in clinical samples four second-order factors, probably due to range effects (Lee et al., 1999). However, EMSs are highly intercorrelated, and inspection of factor-loadings shows a number of cross-loadings (e.g., Lee et al., 1999; Muris, 2006). Overall, SQ scales have shown a moderate degree of stability in clinical samples. Sex differences in EMSs have been reported (e.g., Lachenal-Chevallet et al., 2006; Stopa et al., 2001; Welburn et al., 2002), but findings have been inconsistent and are likely due to sample variations.

It has also been demonstrated that EMSs are related to recollections of childhood trauma and adverse parenting and are associated with insecure attachments styles. However, specific family origins of schema domains, proposed by Young et al. (2003), have not emerged.

The associations between EMSs and psychological disorders have been investigated extensively. In accordance with theory, EMSs have shown to be more strongly related to personality disorders than symptoms disorders (Lee et al., 1999; Nordahl et al., 2005). In research on EMSs and psychopathology, EMSs were usually correlated with psychological problems, or individuals sharing the same diagnosis have been compared with non-clinical samples or groups within the same diagnostic category (e.g., addiction or eating disorders).

Results have consistently shown that patients had higher scores on EMSs than controls and that EMSs discriminate between groups. However, in contrast to the content-specificity hypothesis in cognitive therapy (Alford & Beck, 1997), consistent patterns of specific relationships between EMSs and different forms of psychopathology have not emerged. According to van Vlierberghe et al. (2010), this may be due to important shortcomings of these studies. First, comorbidity, although common, has not been taken into account. Next, high intercorrelations between EMSs complicate the assessment of the relative importance of the different EMSs and may have caused counterintuitive findings in regression analyses. Reeves and Taylor (2007), for example, found negative associations between the enmeshment schema and symptoms of borderline personality disorder and between the social isolation schema and paranoid personality disorder. In Cecero et al.'s (2004) study, physical abuse predicted the enmeshment schema negatively.

Despite the large number of studies that have been conducted on Young's schema model, there are important gaps, including the following: With respect to the developmental model, associations between EMSs and retrospective accounts of parenting and trauma have been shown, but Young's schema model also describes schema formation from a slightly different perspective, namely as failure to accomplish psychosocial developmental tasks (Young et al., 2003). However, there is a lack of studies that explore the relationship between EMSs and the resolution of developmental tasks. In this respect, Erik Erikson's (1950) psychosocial model provides a useful framework for the investigation of these relationships. The focus of Erikson's model on basic psychosocial tasks in the life span and emphasis on social and societal influences on personality development makes it especially suited for the examination of the relationships between EMSs and the resolution of psychosocial developmental tasks. The assumption of links between these constructs would be strengthened if there were evidence that schema change predicts resolution change in addition to cross-sectional correlations.

Further, the relationships between EMSs and the personality dimensions of the five-factor model (FFM) have been solely investigated in non-clinical individuals (Muris, 2006; Sava, 2009). However, non-clinical and clinical samples may differ in important ways and research is needed that examines these associations in a clinical sample. The investigation of the relationship between EMSs and the FFM is important for several reasons: It contributes to the assessment of the trait aspect of EMSs and their discriminant validity with respect to personality tendencies. Further, Glass and Arnkoff's (1997) suggestion that cognitive self-

statement measures should have incremental validity beyond measures of personality can be tested with respect to the Schema Questionnaire.

Finally, Young's schema theory proposes that EMSs have a mediating role between parental rearing style and personality disorder symptomatology in adulthood. This hypothesis has been tested with respect to specific personality disorder categories, e.g., avoidant and borderline personality disorder (e.g., Carr & Francis, 2010; Specht et al., 2009), but not the whole range of personality disorder symptomatology.

3. AIMS OF THE PRESENT STUDY

The general purpose of the present study is to test assumptions inherent in the schema model of schema therapy. More specifically, the study aims to investigate the following questions:

- How are EMSs and the resolution of psychosocial developmental tasks related?
- Does schema change predict changes in developmental task resolution?
- What are the relationships between EMSs and the dimensions of the five-factor model of personality (FFM)?
- Do EMSs add to the understanding of depressive symptoms beyond the FFM?
- Do EMSs mediate the relationships between recollections of parental rearing and symptoms of personality disorders?

4. METHOD

4.1 Participants

The sample consisted of one hundred forty-nine (73% female) psychiatric outpatients receiving treatment at Helgeland Hospital Trust Mo i Rana and Levanger Hospital in Norway. Their mean age was 39.2 years (SD = 11.8, range = 18 - 67). Current marital status was married (32%), cohabitated (29%), single (27%), divorced/separated (10%), and widowed (2%). The highest educational level was lower secondary school for 18% of the sample, upper secondary school for 37%, and higher education for 35% (10% did not report their educational level). Participants were diagnosed by their therapist according to ICD-10 criteria. At both clinics, the Mini International Neuropsychiatric Interview (Sheehan et al., 1998) is routinely used in the diagnostic evaluation of patients. The most common diagnoses in the sample were depressive disorders (44%), social phobias (24%), agoraphobia (15%), personality disorders (10%), panic disorder (10%), posttraumatic stress disorder (9%), dysthymia (8%), and generalized anxiety disorder (7%). Sixty-one patients (41%) had two or more diagnoses. Personality disorders were probably underdiagnosed by the clinicians in the current sample as one from prevalence data (e.g., Zimmerman et al., 2005) would have expected a much higher proportion (approximately 45%) of participants having a specific or unspecified PD.

4.2 Measures

The Schema Questionnaire-Short Form (SQ-SF) assesses 15 EMSs. The scales consist of the five items with the highest loadings on the 15 factors that emerged in a factor analysis of the long form of the SQ (Schmidt et al., 1995). EMSs are grouped in five broad domains: disconnection and rejection (abandonment, mistrust, emotional deprivation, defectiveness, social isolation), impaired autonomy and performance (dependence, vulnerability, enmeshment, failure), impaired limits (entitlement, insufficient self-control), other-directedness (subjugation, self-sacrifice, approval-seeking), and overvigilance and inhibition (negativity, emotional inhibition, unrelenting standards, punitiveness). Respondents are asked to rate statements on a six point Likert scale from "completely untrue of me" to "describes me perfectly". The Norwegian translation of SQ-SF has shown adequate reliability, validity in predicting psychopathology, and factor structure (Hoffart et al., 2005).

Measures of Psychosocial Development (MPD; Hawley, 1988) is a 112-item self-report inventory, designed to assess positive and negative attributes associated with successful

and unsuccessful resolution of the eight psychosocial crises described by Erikson (1950). Items consist of short self-descriptive statements, for example, "optimistic, hopeful" (positive resolution of the stage of trust vs. mistrust) or "life has passed me by" (negative resolution of the stage of integrity vs. despair). Items are answered on a five-point scale from "very much like me" to "not at all like me". Resolution scores are obtained by calculating the difference between positive and negative attitudes for a particular stage. According to the manual, construct validity of the inventory has been tested by means of a multitrait-multimethod matrix design. Results indicated evidence of convergent and discriminate validity. The MPD has been translated to Norwegian by a psychologist (Ingrid Kåsi) and the present author. The backtranslation to English by an independent professional translator has been approved by G. Hawley.

The DSM-IV and ICD-10 Personality Questionnaire (DIP-Q; Ottosson et al., 1995) is a 140-item self-report inventory, developed to assess the DSM-IV (APA, 2000) and ICD-10 (WHO, 1993) PDs. Items were constructed to correspond as closely as possible to the diagnostic criteria in DSM-IV and ICD-10, but item wording had been simplified and shortened to enhance readability. Items are answered in a true/false format. Ottosson, Grann, and Kullgren (2000) report an acceptable level of test-retest reliability. Comparison with a structured interview for PDs showed that the DIP-Q has high sensitivity, but relatively low specificity (Ottosson et al., 1998). In the current study, the instruction of the DIP-Q had been slightly altered: participants were asked to consider the past six month (instead of the past five years) when answering the items.

The authorized Norwegian translation of the NEO PI-R (Costa & McCrae, 1992; Nordvik, Østbø, & Martinsen, 2003) was used to measure the five-factor model. The NEO PI-R is a 240-item self-report questionnaire, designed to assess the five domain factors and their 30 facets. Respondents are asked to rate statements on a five-point Likert scale from *strongly disagree* to *strongly agree*. The applicability of the NEO PI-R in psychiatric samples has been demonstrated (Bagby et al., 1999; Costa, Bagby, Herbst, & McCrae, 2005). The Norwegian version of the NEO PI-R has shown satisfying reliability, and its factor structure is highly congruent with the structure found in the original manual with two exceptions: the impulsiveness facet of neuroticism and the assertiveness facet of extraversion had their highest loadings on extraversion and neuroticism, respectively (Nordvik, 2005).

The Beck Depression Inventory (BDI; Beck et al., 1979) is a 21-item self-report measure designed to assess the severity of depressive symptomalogy. Affective, cognitive, motivational, and physiological symptoms of depression are rated from 0 to 3 in terms of their

intensity. The BDI is scored by summing the responses to all items. The BDI has been shown to have adequate psychometric properties (Beck, Steer, & Garbin, 1988).

The s-EMBU (Arrindell et al., 1999; Arrindell et al., 2001) is a 23-item self-report inventory, designed to measure adults' perceptions of their parents' rearing style. The s-EMBU is a short version of the original 81-item EMBU (Perris, Jacobsson, Lindstrøm, von Knorring, & Perris, 1980) and assesses perceptions of parental rejection, emotional warmth, and overprotection. Items are answered on a four-point Likert scale with reference to father and mother separately. The factor structure of the s-EMBU has been confirmed in different cultures (Arrindell et al., 2005; Arrindell et al., 2001; Arrindell et al., 1999). Studies on the convergent validity of the EMBU/s-EMBU with the Parental Bonding Instrument (PBI; Parker et al., 1979) have shown moderate to strong relations between emotional warmth (as measured with the EMBU) and care (as measured with the PBI) and the overprotection scales of the EMBU and PBI. The EMBU rejection scale was positively associated with PBI overprotection and negatively with PBI care (Arrindell, Gerlsma, Vandereycken, Hageman, & Daeseleire, 1998; Livianos-Aldana & Rojo-Moreno, 1999).

4.3 Procedure

All data were collected in the period from March 2004 to April 2008. After receiving information about the study, patients interested in participating signed an informed consent form. The instruments were then mailed to the participants for completion at home. Patients were rewarded with a lottery ticket for their participation. In addition, they received a personality profile based on the NEO PI-R. The respective therapists were informed about the results of the inventories if the participant had agreed to it on the informed consent form. Out of 211 patients who signed the informed consent form, 149 (71%) returned the questionnaires to the researcher. For ethical reasons, data about patients who were not asked by their therapist, did not consent, or did not return the inventories were not stored.

Participants were at different stages of treatment when completing the inventories the first time (T1). Median time period between treatment start and participation in the study was seven months. After six months (T2), participants were asked to complete the inventories again (which the exception of the NEO PI-R; the s-EMBU was only administered at T2). One hundred-fourteen participants (77% of the original sample) returned the inventories at T2. Sixty percent of these participants were still in treatment. On average, patients have received treatment for about four to five months between T1 and T2. Approximately 85% of the

participants reported that they had received individual therapy, 40% (predominantly cognitive-behaviorally oriented) group therapy, and 40% medications.

4.4 Missing data

Scales were excluded from analyses when more than 20% of answers were missing. When the proportion was less than 20%, missing data were replaced by a person mean substitution procedure. This procedure involves the replacement of a missing item with the mean of the persons responds to the remaining items of the respective scale (Downey & King, 1998). Due to missing data, the N in the three papers varies.

4.5 Ethical considerations

Voluntariness of participation, informed consent, confidentiality, and benefit for the participating individual have been central in the conduction of the study. When the data collection was completed, all data were made anonymous. The study has been approved by the Regional Committee for Medical Research Ethics for Northern Norway and the Norwegian Social Science Data Services regarding the collection and storage of patient information.

5. SUMMARY OF RESULTS

5.1 Paper I: Relationships between early maladaptive schemas and psychosocial developmental task resolution

According to the schema model in schema therapy (Young et al., 2003), EMSs and the resolution of psychosocial developmental tasks are closely intertwined. EMSs are suggested to develop because noxious relational experiences hinder the accomplishment of important psychological tasks (e.g., to establish secure attachment or develop a sense of autonomy). On the other hand, EMSs are also hypothesized as underlying causes of poor psychosocial functioning. The present study explored the relationships between EMSs and the resolution of developmental tasks in the life span, using Erikson's (1950) psychosocial model of personality development as theoretical framework in 145 adult psychiatric outpatients.

Results showed that all but the self-sacrifice and entitlement schemas exhibited significantly negative correlations with task resolution scores. Variance in resolution scores accounted for by the SQ-SF scales (R^2) ranged from 0.44 (initiative) to 0.64 (trust), with a median value of .55. Contrary to expectations, the entitlement, unrelenting standards, and self-sacrifice schemas had significant positive standardized regression weights with respect to the developmental tasks of trust (self-sacrifice), autonomy (entitlement), initiative, industry, and generativity (unrelenting standards and self-sacrifice). Finally, schema change predicted between 8% and 14% of the change in resolution scores over a six month period (Mean R^2 change = 10.4).

In conclusion, results of the current study are in accordance with Young's (1999) theory of schema development by showing meaningful relations between EMSs and the developmental tasks an individual encounters in the life-span, as described in Erikson's (1950) psychosocial model. Generally, EMSs were, as expected, associated with negative resolutions of psychosocial developmental tasks. However, results also indicated that the self-sacrifice and entitlement schemas were unrelated to the resolution of developmental tasks. Finally, the present study demonstrated that changes in EMSs predicted changes in psychosocial developmental task resolution.

5.2 Paper II: Personality and early maladaptive schemas: A five-factor model perspective

According to Young's schema model (Young et al., 2003), innate personality tendencies are important for the understanding of early maladaptive schemas (EMSs). The current study examined the relations between EMSs and the dimensions of the five-factor model of personality (FFM) in 147 adult outpatients. Further, the incremental validity of EMSs in the prediction of depressive symptoms above the FFM dimensions was explored.

Correlational analyses showed a substantial overlap between EMSs and neuroticism with the exception of the emotional deprivation, enmeshment, emotional inhibition, and entitlement schemas. Significant correlations were also found between EMSs and the dimensions of extraversion, agreeableness, and conscientiousness. As hypothesized, EMSs were only weakly related to the domain of openness. The FFM personality dimensions explained between 9% and 42% of the variance in the SQ-SF scales (mean $R^2 = .27$). The FFM domains were particularly effective in predicting the insufficient self-control, dependence, social isolation, failure, subjugation, entitlement, and defectiveness schemas, but they were poorer predictors of the enmeshment, emotional deprivation, and self-sacrifice scales. The SQ-SF total score predicted 11% of the variance in BDI scores when controlled for the five personality dimensions.

In conclusion, results of the present study showed a generally high degree of overlap between EMSs as measured by the SQ-SF, and the dimensions of the FFM, neuroticism in particular. However, the degree of overlap varied between EMSs. Finally, EMSs contributed significantly to the prediction of depressive symptoms when controlled for the five personality dimensions.

5.3 Paper III: Mediation of early maladaptive schemas between perceptions of parental rearing style and personality disorder symptoms

Previous research has shown associations between recollections of poor parenting and personality disorders. Adverse relational experiences in childhood are also assumed to be the main cause for the development of EMSs. Further, EMSs are proposed to be the defining core of personality disorders. The study explored the links between perceived parental rearing behaviors, EMSs, and personality disorder symptoms in 108 psychiatric outpatients.

In line with previous research, results indicated significant associations between recalled parental rearing style, EMSs, and personality disorder symptoms in adults. Rejection from both parents and less maternal emotional warmth were significantly related to cluster A and B personality pathology, whereas cluster C symptoms were associated with paternal rejection. With respect to EMSs, all five schema domains were significantly related to paternal and (except for the impaired limits schema domain) maternal rejection. The disconnection/rejection, other-directedness, and vigilance/overinhibition domains were associated with less maternal emotional warmth. Parental overprotection was not associated with personality disorder symptoms or schema domains.

A series of multiple mediation analyses was conducted to test the hypothesis that EMSs mediate the relations between perceived parental rearing style and personality disorder symptoms. Following the recommendations by Hayes (2009; Preacher & Hayes, 2008), a bootstrapping procedure was applied to estimate total and specific indirect effects. With respect to cluster A and C symptoms, significant indirect effects through EMSs were found for parental rejection and low levels of maternal warmth. Regarding cluster B symptoms, EMSs mediated the relationships with parental rejection. However, significant direct effects of maternal rejection and less maternal emotional warmth were also found.

It is concluded that the findings of the study are in accordance with the theoretical model on which schema therapy is based.

6. GENERAL DISCUSSION

6.1 Main results

The present study investigated three aspects of the schema model in schema therapy: 1) the relationships between EMSs and resolution of psychosocial developmental tasks; 2) associations between EMSs and personality traits; and 3) the mediating role of EMSs between perceptions of parental rearing style and symptoms of personality disorders.

Results of paper 1 showed that, as hypothesized, most EMSs (with the exception of the self-sacrifice and entitlement schemas) were associated with poor functioning in important psychosocial domains. Schema change predicted changes in psychosocial functioning over a six month period, further confirming the interconnections between EMSs and psychosocial tasks.

In paper 2, significant associations between EMSs and the personality dimensions of the five-factor model were found. It has further been demonstrated that EMSs have incremental validity over the FFM in the prediction of depressive symptoms.

In paper 3, mediation of schema domains between recollections of parental rearing behaviors and personality disorder symptoms was shown. However, significant direct effects of maternal rejection and less maternal emotional warmth on cluster B personality disorder symptoms were also found.

These study results contribute to a better understanding of the construct of EMSs. Although the study design prevents inferences about causal relationships between EMSs, the resolution of developmental tasks, perceived parental rearing, and normal and disordered personality traits, the observed associations shed some light on the concept of EMSs.

Erikson (1950) outlined important psychosocial challenges an individual is confronted with throughout the life-span. He argued that an individual's personality develops and matures through the encounter with his/her interpersonal world. Similarly, Young (Young et al., 2003) proposes that early relationship experiences are crucial to the formation of personality, which he in the Beckian tradition conceptualize as built of adaptive and maladaptive schemas. His definition of EMSs as broad life themes resembles Erikson's (1950) notion of psychosocial conflicts or crises. The strong overlap between EMSs and the eight psychosocial challenges described by Erikson (1950) underscores the relatedness between both theories and supports an interpersonal component of EMSs. According to Erikson's model, different psychosocial challenges are particularly important at different ages

in the life-span. The finding that EMSs predict negative resolution of all eight tasks supports the pervasive impact of EMSs on important psychological life domains.

On the other hand, the results of the study regarding the relationships between EMSs and the dimensions of the five-factor model enhance the knowledge about the role of personality traits for the understanding of EMSs. The examination of these relationships is important as EMSs are proposed to be trait-like (Young et al., 2003). In accordance with Young's schema model and previous research on EMSs and personality/temperament (e.g., Halvorsen et al., 2009; Muris, 2006), most EMSs were significantly correlated with neuroticism, but significant associations were also observed with extraversion, agreeableness, and conscientiousness. This finding suggests that EMSs have a trait component. However, the degree of overlap between EMSs and the FFM personality dimensions varied between EMSs, suggesting that personality traits are differently important to the understanding of the specific EMSs. The variations found in the present study are in accordance with theory and previous findings. For instance, the highest proportion of variance the five-factor model personality dimensions accounted for in the present study was in the insufficient self-control schema. In the description of this schema, Young et al. (2003) note that often no specific beliefs go along with this schema and patients may experience it as being outside of their control. In contrary, the FFM dimensions were relatively weak predictors of the enmeshment schema. Recently, Wang et al. (2010) found that the long-term stability of this schema was low and non-significant. Thus, the enmeshment schema may reflect a state rather than a trait.

In addition to the question of state and trait components of EMSs, the study of the associations with the FFM has further implications. Due to its comprehensiveness in summarizing the domain of personality traits, the FFM is often used in the evaluation of psychological scales. Concerns have been raised regarding the classification of EMSs (Freeman & Martin, 2004; Riso et al., 2006). The overlap between EMSs is considerable, and the theoretical basis of the schema list relatively weak. Accordingly, Riso (2007; Riso et al., 2006) suggested that the FFM may be used to improve the taxonomy of schemas. From this perspective, it can be observed that the SQ-SF scales in the current study showed relatively low discriminant validity with respect to the FFM personality dimensions. Further, the domain of openness dimension was largely unrelated to EMSs, but also traits associated with high extraversion, high conscientiousness, and high agreeableness are represented weakly or not at all in the SQ-SF. However, from an FFM perspective, extreme variants of all FFM traits are associated with typical problems (Costa & Widiger, 2002). Thus, the schema list could be revised in order to include personality tendencies lacking in the current taxonomy.

The use of the FFM would imply a bipolar conceptualization of schemas as suggested by Elliott and Lassen (1997) or Kelly (1955). However, the FFM is a pure descriptive model and does not take into account developmental aspects of EMSs. Alternatively, it has been suggested to embed schema theory in an established developmental model (Leahy, 1995). Freeman (Freeman, 1993; Freeman & Martin, 2004) suggested Erikson's (1950) model of psychosocial development as a viable theoretical framework, but attachment theory (Bowlby, 1977) has also been proposed (e.g., Perris, 2000).

It has also been demonstrated that EMSs have incremental validity in the prediction of depressive symptoms beyond the FFM. This finding is important as it supports the usefulness of the SQ-SF for the understanding of psychopathology, in this case depressive symptoms, beyond personality traits (cf. Glass & Arnkoff, 1997). There is an increasing awareness that variations in normal personality characteristics are important to take into account when treating depression and other psychological problems (e.g., Kotov, Gamez, Schmidt, & Watson, 2010; Zinbarg, Uliaszek, & Adler, 2008). However, the finding of the present study suggests that EMSs add to the prediction of depressive symptoms above normal personality traits.

Finally, the current study aimed to go beyond a pure description of the relationships between EMSs and psychopathology, but to explore the hypothesized pathways from parental rearing practices via EMSs to personality disorders. The relationships between adverse parental rearing in childhood and psychological problems in adulthood are well-established (Perris, Arrindell, & Eisemann, 1994), but the exact mechanisms are unclear. Schema theory in cognitive therapy (Beck & Kovacs, 1978; Young, 1990) suggests that schemas connect childhood experiences with adult psychopathology. Therefore, a model in which EMSs mediate between perceived parental rearing style and symptoms of personality disorders was tested statistically. Results showed that the disconnection schema domain was a common mediator between recalled adverse parenting and all three clusters of personality disorder symptomatology. The impaired limits domain was a specific mediator for symptoms of cluster B personality disorder. In sum, findings give preliminary support to Young's (1990) proposal that EMSs have an important role in linking adverse parent-child relationships with personality related disorders in adulthood. However, in contrast to schema theory, but in accordance with previous studies, specific relationships between early relational experiences and EMSs were not found in the current study.

6.2 Study limitations

Several study limitations warrant consideration. First, the assessment of all examined constructs relied solely upon self-report. Shared method variance might have inflated the correlations between the measures. In addition, pathoplastic effects of psychopathology on self-image may have influenced the completion of the inventories (Widiger & Smith, 2008). However, it has been demonstrated that personality traits and recollections of parental rearing styles can be reliably assessed during depression (Costa et al., 2005; Lizardi & Klein, 2005; Ready & Clark, 2002; Richter & Eisemann, 2000).

With respect to the assessment of PD symptoms, self-report instruments have, in general, shown a tendency to overdiagnose personality pathology (Widiger & Samuel, 2005). In addition, the instruction of the DIP-Q had been modified in the current study to be more sensitive to fluctuations of PD symptoms, involving a higher risk of state effects. Therefore, effects of depressive mood were controlled for when the DIP-Q was included in analyses.

Additionally, measurement of cognitive schemas remains an ongoing challenge (Pretzer & Beck, 2004). Although the SQ-SF is well validated, one of the difficulties in assessing schemas is that they are thought to be, at least in part, unconscious (Young, 1999). An individual may not be aware of having a particular EMS (Young et al., 2003). For example, according to Young et al. (2003), the emotional deprivation schema is common but often not recognized by patients. In addition, coping strategies (e.g., schema avoidance) may impact self-report of EMSs. Further, three EMSs from the current schema list are not covered by the SQ-SF (approval-seeking, negativity/pessimism, and punitiveness). High correlations between individual schemas and schema domains represent a problem for multiple regression analyses with EMSs as independent variables. Generally, correlations between independent variables may lead to small unique contributions of the independent variables in the prediction of the dependent variable and to suppressor effects (Tabachnick & Fidell, 2007). Therefore, despite non-significant multicollinearity statistics, regression coefficients in the current investigation must be interpreted with caution.

Finally, participants in the current investigation represented a convenient sample of outpatients with predominantly depression and anxiety disorders, and the generalization of the findings to other populations (e.g., inpatients, forensic patients) is unclear. In addition, the presence of PDs has not been assessed systematically in the current sample. A larger sample would have allowed for more fine-grained analyses, e.g., an examination of the relations between specific EMSs (instead of schema domains) and the particular personality disorder categories (instead of cluster of personality disorder symptoms) in paper 3.

6.3 Future research

The research literature regarding EMSs has been rapidly growing in recent years. Associations between EMSs and a broad range of psychiatric diagnoses and psychological problems have been reported. Thus, the maladaptivity of schemas has been demonstrated. It has also been shown that individuals who have been physically or emotionally abused in childhood or remember their parents' rearing style as cold and rejecting also report a higher level of maladaptive schemas. Further, EMSs have shown to be moderately stable in patients over a time period for up to nine years. Nevertheless, important questions remain to be answered.

First of all, more research is needed to further evaluate whether the Schema Questionnaires measure what they are intending to measure, namely underlying cognitive structures built early in the development through an interaction between temperament and repeated adverse relationship experiences and serving as templates for processing later experiences (cf. Stopa et al., 2001). In this regard, the development and course of maladaptive schemas and their relationships with psychopathology in childhood and adolescence need more research. Recently, measures of EMSs for children have been developed. These measures may help to investigate the development, course, and stability of EMSs from childhood to adulthood. Preliminary results showed that EMSs can be identified and distinguished in childhood. However, results also suggest that the self-sacrifice and enmeshment schemas cannot be considered maladaptive in children (Rijkeboer & de Boo, 2010). Further, the relative impact of temperamental and environmental factors (e.g., attachment security, trauma, bullying) on the formation of EMSs needs more investigation. The results from the Muris (2006) and the current study suggest that the role of innate personality and relationship experiences may vary between EMSs. Young et al.'s (2003) hypotheses about non-conditional (formed early in life) and conditional EMSs (formed later in life and not as powerful and pervasive) have not been tested yet.

Similarly, little is known about the proposed role of EMSs in information processing. For example, Spinhoven, Bockting, Kremers, Schene, and Williams (2007) found that autobiographic memory retrieval to cues that match EMSs is impaired in individuals with borderline personality disorder. The authors offer several possible explanations of this finding, e.g., attentional capture or reduced processing resources after schema activation.

Usually, self-report questionnaires are used to assess EMSs in individuals. However, in terms of Ingram and Kendall's (1986) cognitive taxonomy, these inventories measure cognitive products but not schemas or schema operations (Merluzzi & Carr, 1992). In

addition to cognitions, the definition of EMSs comprises emotions, memories, and bodily sensations. There is a need to develop alternative assessment methods that trespass the shortcomings of self-report questionnaires and include all aspects of EMSs. As alternatives to self-report inventories, projective tests or laboratory methods utilized in basic research on information processing are proposed (De Houwer, 2002; Pretzer & Beck, 2004; Segal & Swallow, 1994; Welburn et al., 2002). Sarin and Abela (2003) and Abela et al. (2009), for instance, applied a life-history approach to the assessment of EMSs. Weertman et al. (2008) found that an implicit measure of self- and other-associations added to the prediction of symptoms of obsessive-compulsive personality disorder beyond an explicit measure of beliefs associated with this diagnosis. The use of the Stroop-test or self-scenarios has also been suggested (Segal and Swallow, 1994).

7. CONCLUSIONS

The present study showed close relationships between EMSs and poor psychosocial developmental task resolution in adult psychiatric outpatients. Moreover, schema change was associated with changes in psychological functioning.

It has further been shown that EMSs are related to the dimensions of the five-factor model of personality, high neuroticism in particular, but also to low extraversion, low agreeableness, and low conscientiousness. EMSs have incremental validity in the prediction of depressive symptoms beyond personality traits.

Finally, results support a model in which EMSs mediate between recollections of parental behavior and symptoms of personality disorders.

APPENDIX

J. Young's (1999) Schema List

Early Maladaptive Schema	Description
Disconnection and rejection domain	
Abandonment/instability	The perceived instability or unreliability of significant others for emotional support and connection.
Mistrust/abuse	The expectation that others will hurt, abuse, humiliate, manipulate, or take advantage intentionally.
Emotional deprivation	The expectation that one's needs for nurturance, empathy, and protection will not be met by others.
Defectiveness/shame	The belief that one is inwardly defective, flawed, and unlovable to significant others if exposed.
Social isolation	The feeling that one is isolated from the world, different from others, and/or not part of any community.
Impaired autonomy and performance domain	
Dependence	The belief that one is incapable to handle day-to-day responsibilities competently and independently.
Vulnerability to harm	An exaggerated fear that an imminent and unpreventable catastrophe (financial, natural, medical, criminal) will strike at any moment.
Enmeshment	Excessive emotional overinvolvement and closeness with significant others at the expense of full individuation.
Failure	The belief that one is fundamentally inadequate in areas of achievement compared to peers.
Impaired limits domain	
Entitlement	The belief that one should be able to do what one wants regardless of what is realistic or considered reasonable by others.
Insufficient self-control	The pervasive difficulty to exercise sufficient self-control and frustration tolerance to achieve one's goals, as well as to restrain expression of feelings and impulses.
Other-directedness domain	
Subjugation	The belief that one has to surrender control to others in order to avoid negative consequences.
Self-sacrifice	The excessive focus on meeting the needs of others at the expense of one's own gratification.
Approval-seeking	The excessive emphasis on gaining approval from other people at the expense of developing a secure and true sense of self.
Overvigilance and inhibition domain	
Negativity/pessimism	A pervasive, lifelong focus on the negative aspects of life.
Emotional inhibition	The belief that one must inhibit spontaneous emotions and actions, often to avoid disapproval by others or feelings of shame.
Unrelenting standards	The belief that one must strive to meet very high internalized standards of behavior and performance.
Punitiveness	The belief that people who does not meet one's standards and expectations should be harshly punished.

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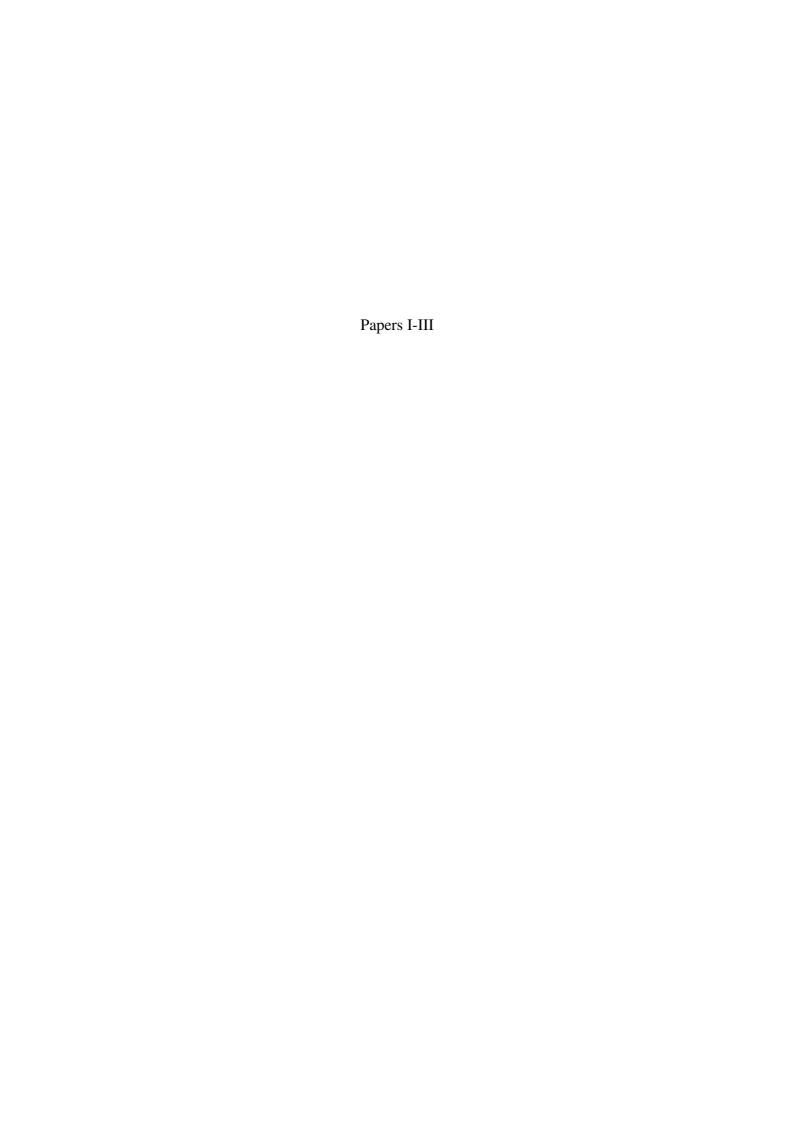
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Papers I-III

Paper I

Paper II

Personality and early maladaptive schemas: A five-factor model perspective

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ABSTRACT

According to Young's schema model (Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York: Guilford Press), innate personality tendencies are important for the understanding of early maladaptive schemas (EMS). The current study examined the relations between EMS and the dimensions of the five-factor model of personality (FFM). One hundred and forty-seven adult outpatients completed the NEO PI-R, the Schema Questionnaire-Short Form (SQ-SF), and the Beck Depression Inventory (BDI). Correlational analyses showed a substantial overlap between EMS and the FFM, neuroticism in particular. EMS predicted depressive symptoms above and beyond the FFM personality dimensions. Implications of these findings are discussed.

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1. Background

In schema therapy (ST; Young, 1999; Young, Klosko, & Weishaar, 2003), early maladaptive schemas (EMS), are proposed as the core and main target for treatment of personality disorders and long-standing characterological problems. The current definition of an EMS is "a broad, pervasive theme or pattern, comprised of memories, emotions, cognitions, and bodily sensations, regarding oneself and one's relationships with others, developed during childhood or adolescence, elaborated throughout one's lifetime and dysfunctional to a significant degree" (Young et al., 2003, p. 7).

In the formation of schemas, innate temperament interacts with early adverse relational experiences (Young et al., 2003). More specifically, EMS develop when universal psychological core needs (e.g., secure attachment, autonomy, freedom to express valid needs and emotions, realistic limits) are not met. According to Young et al. (2003), the child's temperament plays a major role in the development of schemas since an extreme temperament makes the child more likely to be exposed to aversive parental rearing or may even override an ordinary early environment. Early maladaptive schemas operate on the deepest level of cognition, usually outside of awareness, and make the individual psychologically vulnerable to develop depression, anxiety, dysfunctional relationships,

addiction, and psychosomatic disorders (Young, 1999). When a schema is triggered, the individual may respond to it with a maladaptive coping style (e.g., overcompensation, avoidance, surrender) that perpetuates the schema (Young et al., 2003). EMS are thought to be trait-like (Weishaar & Beck, 2006; Young et al., 2003) in that they are stable over time. Recently, this assumption has been supported by empirical findings showing high stability correlations over a 2.5–5 year interval despite significant changes in depression severity (Riso et al., 2006). However, an EMS is not necessarily activated at every moment. In order to account for rapid shifts in emotional state, e.g., in patients suffering from borderline or antisocial personality disorder (Lobbestael, Arntz, & Sieswerda, 2005), the concept of schema modes has been integrated in ST. Young et al. (2003) define a schema mode as "those schemas or schema operations — adaptive or maladaptive — that are currently active for an individual" (p. 37).

In ST, EMS are assessed through several questionnaires, a focused life history, imagery exercises, and the therapeutic relationship. The Schema Questionnaire — Short Form (SQ-SF) is an abbreviated version of the 205-item Schema Questionnaire (SQ; Young & Brown, 1999) and comprises 75 items, reflecting 15 EMS (briefly described in Table 1). Overall, the SQ-SF has shown similar internal consistency and predictive validity with respect to psychopathology as the SQ (e.g., Oei & Baranoff, 2007; Stopa, Thorne, Waters, & Preston, 2001; Waller, Meyer, & Ohanian, 2001). Its factor structure has been examined and largely confirmed in several studies (e.g., Calvete, Estevez, Lopez de Arroyabe, & Ruiz, 2005; Hoffart et al., 2005; Welburn, Coristine,

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Table 1
SQ-SF scales.

Early maladaptive schema	Description
Abandonment/ instability	The perceived instability or unreliability of significant others for emotional support and connection.
Mistrust/abuse	The expectation that others will hurt, abuse, humiliate, manipulate, or take advantage intentionally.
Emotional deprivation	The expectation that one's needs for nurturance, empathy, and protection will not be met by others.
Defectiveness/ shame	The belief that one is inwardly defective, flawed, and unlovable to significant others if exposed.
Social isolation	The feeling that one is isolated from the world, different from others, and/or not part of any community.
Dependence	The belief that one is incapable to handle day-to-day responsibilities competently and independently.
Vulnerability to harm	An exaggerated fear that an imminent and unpreventable catastrophe (financial, natural, medical, criminal) will strike at any moment.
Enmeshment	Excessive emotional over involvement and closeness with significant others at the expense of full individuation.
Failure	The belief that one is fundamentally inadequate in areas of achievement compared to peers.
Entitlement	The belief that one should be able to do what one wants regardless of what is realistic or considered reasonable by others.
Insufficient self-control	The pervasive difficulty to exercise sufficient self-control and frustration tolerance to achieve one's goals, as well as to restrain expression of feelings and impulses.
Subjugation	The belief that one has to surrender control to others in order to avoid negative consequences.
Self-sacrifice	The excessive focus on meeting the needs of others at the expense of one's own gratification.
Emotional inhibition	The belief that one must inhibit spontaneous emotions and actions, often to avoid disapproval by others or feelings of shame.
Unrelenting standards	The belief that one must strive to meet very high internalized standards of behaviour and performance.

Dagg, Pontefract, & Jordan, 2002). In accordance with theory, EMS have shown to be related to recollections of adverse parenting (Harris & Curtin, 2002) and childhood trauma (e.g., Cecero, Nelson, & Gillie, 2004). In addition, meaningful relations of the SQ and SQ-SF with a number of clinical disorders have been found, e.g., social phobia (Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006), substance abuse (Brotchie, Meyer, Copello, Kidney, & Waller, 2004), eating disorders (Waller, Kennerly, & Ohanian, 2007), personality disorders (e.g., Jovev & Jackson, 2004; Reeves & Taylor, 2007), panic disorder with agoraphobia (Hedley, Hoffart, & Sexton, 2001), or chronic depression (Riso, Maddux, & Santorelli, 2007). These studies show that certain EMS are more strongly related to some disorders than others. However, EMS are apparently a general vulnerability factor for psychopathology as they are relevant for a broad range of psychiatric diagnoses.

The purpose of the present study is to expand the nomological network surrounding the concept of EMS by investigating how EMS are associated with personality traits, i.e., enduring tendencies to show consistent patterns of thoughts, feelings, and actions (McCrae & Costa, 2003). More specifically, the present study aims to examine the relations between the SQ-SF scales and the dimensions of the five-factor model of personality (FFM).

The FFM has its origins in the psycholexical approach to the study of the dimensions of personality (Goldberg, 1993; McCrae & John, 1992). The lexical hypothesis holds that the most important individual differences will become encoded in language (Ashton & Lee, 2005; Goldberg, 1993). In analyses of personality-descriptive terms (e.g. Angleitner, Ostendorf, & John, 1990), five broad dimensions have consistently emerged as the major dimensions of personality variation. Although the FFM has been criticized for various reasons (Block, 1995; McAdams, 1994), there is a strong

consensus today that the five factors "do a reasonably good job of summarizing and organizing the universe of trait descriptors" (McAdams & Pals, 2006, p. 208). In Costa and McCrae's (1992) conceptualization of the FFM, the five domains are labelled neuroticism, extraversion, openness, agreeableness, and conscientiousness. Briefly, neuroticism represents the general tendency of an individual to experience unpleasant emotions. Extraversion refers to individual differences in preference for social interaction and activity. Openness describes the receptiveness to new ideas and experiences. A compassionate, trusting, cooperative, humble, and softhearted attitude towards other people characterize individuals scoring high in agreeableness. Conscientiousness concerns individual differences in organization and goal-directed behaviour (McCrae & Costa, 2003; Piedmont, 1998). The FFM captures the dimensions of most personality inventories (O'Connor, 2002) and has been replicated in many different languages, cultures, and populations (McCrae & Costa, 1997). Because of its comprehensiveness, the FFM is especially useful as a framework for the clarification and evaluation of psychological scales (Funder, 2001; John, Naumann, & Soto, 2008). Genetic studies suggest that the five factors have a biological basis and are heritable (e.g., Jang, McCrae, Angleitner, Riemann, & Livesley, 1998; Yamagata et al., 2006). Further, the five personality dimensions can be distinguished early in childhood (Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005) and are "quite consistent over the life course" (Roberts & DelVechio, 2000, p. 20). Therefore, the conceptual distinction between temperament and personality traits has been challenged by proponents of the FFM (McCrae et al., 2000). Caspi, Roberts, and Shiner (2005) observed that "temperament and personality traits increasingly appear to be more alike than different" (p. 454).

The relationships between FFM dimensions and psychopathology have been extensively investigated. Meta-analyses have demonstrated strong associations between the FFM and axis I and axis II disorders (Malouff, Thorsteinsson, & Schutte, 2005; Samuel & Widiger, 2008; Saulsman & Page, 2004). It has further been shown that shared personality dimensions can account for comorbidity between disorders, e.g., between anxiety and depressive disorders (Spinhoven, de Rooij, Heiser, Smit, & Penninx, 2009) or among the personality disorders (Lynam & Widiger, 2001). However, findings regarding the prediction of response to psychological or pharmacological treatment of depression from the five factors have been mixed (Bagby, Quilty, Segal et al., 2008; Blom et al., 2007).

Thus, by relating the SQ-SF scales to the five-factor model of personality, one can gain a better understanding of which personality dimensions are covered by the inventory and similarities and differences between EMS with respect to associated personality characteristics. Riso (Riso, 2007; Riso et al., 2006) suggests that the investigation of these relationships may improve the discriminant validity of the schemas proposed by Young (1999) and lead to a new taxonomy of EMS. Further, from a more theoretical point of view, the examination of the relationships between EMS and innate personality tendencies is important because temperament is considered to be a significant vulnerability factor for the formation of EMS (Young et al., 2003).

To the present author's knowledge, only two studies have explored the associations between EMS and the personality factors of the FFM so far. Muris (2006) investigated these relationships in a non-clinical adolescent sample (mean age approximately 13 years), using an age-adjusted version of the SQ (YSQ-A) and the Big Five Questionnaire for Children (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003). He reported that all EMS were significantly correlated with neuroticism. In addition, the unrelenting standards schema was positively related to extraversion, agreeableness, openness, and conscientiousness. The self-sacrifice schema was positively associated with agreeableness, and the vulnerability for

harm schema with openness. When discussing the results, the author emphasizes the role of neuroticism for EMS, but offers no explanation for the remaining personality factors although some findings may seem counterintuitive, e.g., the positive correlations of the unrelenting standards and vulnerability schemas with the openness personality dimension. Recently, Sava (2009), applying a canonical correlation analysis, found associations between EMS and low agreeableness and high neuroticism in an undergraduate sample. An important shortcoming of the studies conducted by Muris (2006) and Sava (2009) is the use of non-clinical samples. However, non-clinical and clinical samples may differ in important ways, and previous research on EMS in non-clinical samples has, as in Muris (2006) study, produced some contradictory results. For example, Reeves and Taylor (2007) reported a *negative* relation between borderline personality disorder symptoms and the enmeshment schema among college students. Therefore, research on the relations between the EMS and the FFM using an adult clinical sample is needed.

The purpose of the present study is twofold. The first aim is to investigate the relationships between EMS and the dimensions of the five-factor model of personality in an adult psychiatric outpatient sample in order to identify the personological content of EMS.

Based on the descriptions of EMS and previous research, it is hypothesized that all SQ-SF scales are positively associated with neuroticism. Further, it is expected that the defectiveness, social isolation, and emotional inhibition schemas are related to low extraversion. The mistrust and entitlement schemas are hypothesized to be associated with low levels of agreeableness and the subjugation and self-sacrifice schemas with high agreeableness. Finally, the dependence, failure, and insufficient self-control schemas are expected to be negatively correlated with conscientiousness. The unrelenting standards schema is hypothesized to be positively related to conscientiousness.

The second goal of the study is to investigate the prediction of depressive symptoms from FFM personality dimensions and EMS. Despite expected associations, EMS and the five factors of personality are distinct constructs with different foci. Although strongly related to clinical disorders (Malouff et al., 2005; Samuel & Widiger, 2008), the FFM is primarily a model of normal personality functioning, whereas EMS refer to maladaptive cognitive and emotional themes regarding oneself and relationships in individuals with longstanding psychological and interpersonal problems. In terms of the five-factor theory of personality (McCrae & Costa, 2008), personality traits are biologically based, basic dispositions and EMS dysfunctional characteristic adaptations, shaped through the interaction of the individual with his/her social environment. Therefore, it can be hypothesized that EMS have incremental validity in predicting psychological distress above and beyond the five personality dimensions. Depression is a common mental disorder (e.g., Alonso et al., 2004), and associations of depressive symptoms with both the FFM (Bagby & Ryder, 2000) and EMS (Abela, Auerbach, Sarin, & Lakdawalla, 2009) have been shown. Thus, the second aim of the study is to test the hypothesis that EMS predict depressive symptoms when controlled for the five personality dimensions.

2. Method

2.1. Participants

A total of 147 patients from the psychiatric outpatient clinics at Helgeland Hospital Trust Mo i Rana and Levanger Hospital in Norway participated in the present study. They were referred by general practitioners for treatment at the clinics. The sample consisted of 108 females (74%) and 39 males with a mean age of 39.2

years (SD = 11.9, range = 18–67). Current marital status was married (32%), cohabitated (29%), single (27%), divorced/separated (10%), and widowed (2%). The highest educational level was lower secondary school for 18% of the sample, upper secondary school for 37%, and higher education for 34% (10% did not report their educational level). Participants were diagnosed by their therapist according to ICD-10 criteria. At both clinics, the Mini International Neuropsychiatric Interview (Sheehan et al., 1998) is routinely used in the diagnostic evaluation of patients. The most common diagnoses in the sample were depressive disorders (44%), social phobias (24%), agoraphobia (16%), personality disorders (10%), panic disorder (10%), posttraumatic stress disorder (10%), dysthymia (8%), and generalized anxiety disorder (7%). Sixty-one patients (41%) had two or more diagnoses.

2.2. Measures

The Schema Questionnaire–Short form (SQ-SF; Young & Brown, 1999) is a 75-item self-report questionnaire, designed to assess 15 EMS (Table 1). Items of are answered on a six-point scale from *completely untrue of me* to *describes me perfectly*. Studies on the SQ-SF have previously shown that the inventory has adequate internal consistency and factorial structure (e.g., Hoffart et al., 2005).

The authorized Norwegian translation of the NEO PI-R (Costa & McCrae, 1992; Nordvik, Østbø, & Martinsen, 2003) was used to measure the five-factor model. The NEO PI-R is a 240-item self-report questionnaire, designed to assess the five domain factors and their 30 facets. Respondents are asked to rate statements on a five-point Likert scale from *strongly disagree* to *strongly agree*. Bagby et al. (1999) demonstrated the replicability of the factor structure of the NEO PI-R in a psychiatric sample. The Norwegian version of the NEO PI-R has shown satisfying reliability, and its factor structure is highly congruent with the structure found in the original manual with two exceptions: the impulsiveness facet of neuroticism and the assertiveness facet of extraversion had their highest loadings on extraversion and neuroticism, respectively (Nordvik, 2005).

The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) was used to assess levels of depressive symptoms. The BDI comprises 21 items that are rated on a scale from 0 to 3. Numerous studies have supported the reliability and validity of the BDI (Beck, Steer, & Garbin, 1988).

2.3. Procedure

The present study was part of a research project on the relationships of EMS with perceptions of parental rearing, personality, and psychopathology. After receiving information about the study from their therapists, patients interested in participating signed an informed consent form. The instruments were then mailed to the participants for completion at home. Out of 211 patients who have signed the informed consent form, 149 (71%) returned the questionnaires to the researcher. Due to missing data, two participants were excluded from the current investigation. One participant did not return the BDI. Participants were at different stages of treatment when completing the inventories. Median time period between starting treatment and study participation was seven months. When retested after six month, 85% of a subsample of the current sample (N = 112) reported that they had received individual therapy, 40% (predominantly cognitive-behaviourally oriented) group therapy, and 40% medications. Patients were rewarded with a lottery ticket for their participation. The study has been approved by the Regional Committee for Medical Research Ethics for Northern Norway and the Norwegian Social

Science Data Services regarding the collection and storage of patient information.

3. Results

3.1. Descriptive statistics

Means, standard deviations, and scale reliabilities (Cronbachs α) for the NEO PI-R, SQ-SF, and BDI are shown in Table 2. NEO PI-R domain scores are represented as T-scores with a mean of 50 and a standard deviation of 10. On average, patients participating in the present study are characterized by high neuroticism and low extraversion, low openness, average agreeableness, and low conscientiousness. This pattern of NEO PI-R scores is similar to profiles previously described in psychiatric samples (e.g., Bagby, Costa, Widiger, Ryder, & Marshall, 2005; Østbø & Nordvik, 2008; Wilberg, Karterud, Pedersen, Urnes, & Costa, 2009). Means of SQ-SF scales are comparable to those previously obtained in mixed outpatient samples (e.g., Hoffart et al., 2005). The average BDI score indicate moderate to severe depressive symptoms (cf. Beck et al., 1988).

Internal consistencies (Cronbachs α) for the dimensions of the NEO PI-R, the SQ-SF scales, and the BDI are also displayed in Table 2. In the present study, NEO PI-R dimensions showed good to excellent internal consistencies, with a median α of 0.90. Alpha-coefficients for all but one SQ-SF scales were in the range indicating good to excellent internal consistencies, with a median α of 0.87. The α for the entitlement scale was somewhat lower (0.77), but still acceptable. The BDI displayed good internal consistency ($\alpha = 0.89$).

3.2. Correlations between FFM personality dimensions and EMS

Prior to data analyses, distribution of all variables was examined for normality. Highly skewed variables (the SQ-SF scales mistrust, defectiveness, failure, dependence, enmeshment, entitlement, and insufficient self-control) were log transformed. Correlational analyses were conducted to examine the relationships between NEO PI-R dimensions and SQ-SF scales. Due to the large number of tests, a Bonferroni adjustment of the significance level was applied, and correlations were judged significant at $p < 0.001$. In addition to bivariate correlations, semipartial correlations, and squared multiple correlation coefficients were computed. Semipartial correlations were calculated in order to assess the unique contribution of each personality dimension to the prediction of EMS when controlling for shared variance among the NEO PI-R domains. Squared multiple correlation coefficients were used to measure the total proportion of variance in the SQ-SF scales accounted for by the five personality dimensions (cf. Tabachnick & Fidell, 2007). Results of these analyses are presented in Table 3.

Bivariate correlations showed that most SQ-SF scales were, consistent with expectations, significantly related to neuroticism, with the exception of the self-sacrifice and entitlement schemas. Seven SQ-SF scales (emotional deprivation, mistrust, social isolation, failure, defectiveness, subjugation, and emotional inhibition) were negatively associated with the domain of extraversion. The failure and emotional inhibition schemas were negatively correlated with openness. With respect to agreeableness, there were negative associations with the mistrust, entitlement, and insufficient self-control schemas, whereas the self-sacrifice schema was positively related to this dimension. The dependence and insufficient self-control schemas were negatively correlated with conscientiousness.

Generally, correlations were significantly reduced when the effect of the remaining personality dimensions were partialled out. Correlations between the emotional deprivation, enmeshment, and emotional inhibition scales and neuroticism did not longer reach the level of significance set in the present study. Extraversion remained a significant individual predictor of the social isolation and emotional inhibition schemas. None of the SQ-SF scales had significant semipartial correlations with the domain of openness. Agreeableness was significantly related to the entitlement and insufficient self-control schemas, but no longer to the mistrust and self-sacrifice schemas. When controlling for the other four personality dimensions, conscientiousness was positively related to the unrelenting standards schema and negatively with the insufficient self-control schema.

In order to further explore the relationships between EMS and the five-factor model of personality, squared multiple correlation coefficients were calculated. As shown in Table 3, NEO PI-R dimensions explained between 9% and 42% of the variance in the SQ-SF scales (mean $R^2 = 0.27$). The NEO PI-R domains were particularly effective in predicting the insufficient self-control, dependence, social isolation, failure, subjugation, entitlement, and defectiveness schemas, but poorer predictors of the enmeshment, emotional deprivation, and self-sacrifice scales.

3.3. Prediction of depressive symptoms from FFM domains and EMS

A hierarchical regression analysis was performed in order to test the hypothesis that EMS add to the prediction of depressive symptoms above the five-factor model personality dimensions. In the first step, NEO PI-R dimensions were entered as a block in the regression. Next, in the second step, the SQ total score (the sum of all SQ-SF scales) was entered. The results of these analyses are presented in Table 4. The SQ-SF total score predicted 11% ($p < 0.001$) of the variance in BDI scores when controlled for the five personality dimensions.

4. Discussion

The present study sought to examine the relationships between EMS and the five-factor model personality dimensions in order to

Table 2
Means, standard deviations, and scale reliabilities for the NEO PI-R domains, SQ-SF scales, and BDI.

	M	SD	α
NEO PI-R			
Neuroticism	62.99	10.32	0.93
Extraversion	37.21	11.02	0.91
Openness	43.07	10.33	0.89
Agreeableness	50.99	11.25	0.87
Conscientiousness	45.44	10.95	0.90
SQ-SF			
Emotional deprivation	2.92	1.29	0.88
Abandonment	2.90	1.38	0.90
Mistrust	2.30	1.12	0.90
Social isolation	2.67	1.35	0.93
Defectiveness	2.21	1.18	0.90
Failure	2.36	1.33	0.95
Dependence	1.91	0.91	0.83
Vulnerability	2.35	1.11	0.83
Enmeshment	1.92	1.04	0.84
Subjugation	2.56	1.23	0.88
Self-sacrifice[a]	3.64	1.15	0.85
Emotional inhibition[a]	2.38	1.20	0.88
Unrelenting standards[a]	3.42	1.13	0.81
Entitlement[a]	2.00	0.81	0.77
Insufficient self-control[a]	2.52	1.09	0.86
BDI[a]	19.63	10.49	0.89

$N = 147$.
[a] $N = 146$.

Table 3
Zero-order (r), semipartial (sr), and squared multiple correlation coefficients (R^2).

SQ-SF	NEO PI-R										R^2
	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness		
	r	sr	r	sr	r	sr	r	sr	r	sr	
Emotional deprivation	0.32*	0.20	−0.29*	−0.14	−0.11	0.06	0.07	0.13	−0.15	−0.08	0.15
Abandonment	0.48*	0.42*	−0.22	0.00	−0.08	0.04	−0.12	−0.05	−0.08	0.08	0.24
Mistrust	0.45*	0.27*	−0.34*	−0.19	−0.10	0.11	−0.29*	−0.23	−0.16	0.06	0.29
Social isolation	0.49*	0.30*	−0.43*	−0.30*	−0.06	0.22	−0.04	0.02	−0.16	0.01	0.34
Defectiveness	0.53*	0.45*	−0.27*	−0.03	−0.09	0.06	0.00	0.10	−0.15	−0.02	0.30
Failure	0.47*	0.29*	−0.44*	−0.12	−0.31*	−0.09	0.10	0.21	−0.26	−0.18	0.34
Dependence	0.57*	0.47*	−0.23	0.02	−0.06	0.06	−0.18	−0.03	−0.29*	−0.10	0.35
Vulnerability	0.49*	0.42*	−0.21	0.00	−0.08	0.04	−0.19	−0.11	−0.10	0.08	0.26
Enmeshment	0.28*	0.19	−0.18	−0.08	−0.05	0.06	−0.13	−0.09	−0.10	0.02	0.09
Subjugation	0.53*	0.48*	−0.28*	−0.06	−0.05	0.12	0.10	0.18	−0.08	0.03	0.34
Self-sacrifice[a]	0.11	0.26	0.07	0.16	0.01	−0.04	0.27*	0.25	0.21	0.16	0.16
Emotional inhibition[a]	0.38*	0.17	−0.47*	−0.29*	−0.28*	0.00	−0.10	−0.11	0.00	0.16	0.28
Unrelenting standards[a]	0.27*	0.38*	0.01	0.08	0.10	0.12	0.06	0.05	0.19	0.26*	0.20
Entitlement[a]	0.18	0.13	0.07	0.05	0.17	0.13	−0.51*	−0.43*	−0.25	−0.06	0.31
Insufficient self-control[a]	0.44*	0.25*	−0.18	0.02	−0.05	0.01	−0.42*	−0.23*	−0.53*	−0.33*	0.42

*$p < 0.001$. $N = 147$.
[a] $N = 146$.

enhance the understanding of EMS and associated cognitive, behavioural, and emotional tendencies. A sample of psychiatric outpatients completed the SQ-SF and the NEO PI-R as measures of EMS and the FFM.

The first aim of the current study was to evaluate and clarify the personological content of the SQ-SF scales by means of the FFM. In addition to bivariate correlations, semipartial correlations were calculated in order to examine the unique contribution of each personality dimension to the prediction of the different EMS.

As hypothesized, and in line with the studies conducted by Muris (2006) and Sava (2009) results from correlational analyses showed that most EMS were significantly associated with neuroticism, with the exception of the emotional deprivation, enmeshment, emotional inhibition, and entitlement schemas. Significant correlations were also found between EMS and the dimensions of extraversion, agreeableness, and conscientiousness. As expected, EMS were only weakly related to the domain of openness. Most hypotheses regarding the relationships between EMS and the five personality factors were confirmed when bivariate correlations were computed. In addition, a number of non-predicted correlations emerged. The number of significant relations and confirmed hypotheses decreased markedly when examining semipartial correlations. For example, the hypothesized associations between the defectiveness schema and low extraversion and the dependence schema and low conscientiousness did no longer reach statistical significance. However, both schemas were still

significantly related to neuroticism. Thus, the examination of semipartial correlations suggests that these two schemas are mainly characterized by high neuroticism.

If one adopts Riso's (Riso, 2007; Riso et al., 2006) suggestion that the FFM may be used to improve the taxonomy of schemas, it can be noted that the SQ-SF scales showed relatively low discriminant validity with respect to the FFM personality dimensions. Further, the SQ-SF does not cover the whole range of personality traits offered by the FFM. The domain of openness dimension was largely unrelated to EMS, but also traits associated with high extraversion, high conscientiousness, and high agreeableness are not or weakly represented in the SQ-SF. These findings may suggest that these personality tendencies, which are not well captured by the SQ-SF, are irrelevant or unnecessary for the conceptualization of EMS. Young et al. (2003), for example, argue that sociability, a trait associated with high extraversion, characterizes resilient children. On the other hand, these traits may represent potentially important aspects that are lacking in the current taxonomy of EMS, but should be considered to be integrated in the definition and assessment of schemas. There are typical problems associated with each pole of the dimensions of the FFM (McCrae, Löckenhoff, & Costa, 2005; Widiger, Costa, & McCrae, 2002; Widiger, De Clercq, & De Fruyt, 2009). Some of these problems may reflect EMS or coping responses to EMS.

Generally, the FFM dimensions accounted for a considerable proportion of the variance in most SQ-SF scales. Although causal

Table 4
Summary of hierarchical regression analysis for variables predicting depressive symptoms.

Dependent variable	Step	Predictors	β	t	Significance	R^2	R^2 change	Significance
BDI	1	Neuroticism	0.50	6.06	$p < 0.001$	0.35		
		Extraversion	−0.21	2.17	$p < 0.05$			
		Openness	0.26	3.10	$p < 0.01$			
		Agreeableness	0.10	1.38	ns			
		Conscientiousness	−0.08	−1.11	ns			
	2	Neuroticism	0.25	2.78	$p < 0.01$	0.46	0.11	$p < 0.001$
		Extraversion	−0.15	−1.68	ns			
		Openness	0.21	2.73	$p < 0.01$			
		Agreeableness	0.11	1.60	ns			
		Conscientiousness	−0.09	1.29	ns			
		SQ-SF total score	0.43	5.28	$p < 0.001$			

$N = 145$. ns = not significant at $p < 0.05$.

inferences can not be made due to the cross-sectional design of the current study, findings are in accordance with Young's (Young et al., 2003) schema model that asserts a relationship between innate temperament and EMS. It has been argued that the concepts of temperament and personality traits are highly similar (Caspi et al., 2005; McCrae et al., 2000). The results from the present study suggest that EMS are associated with high neuroticism in particular, but also low extraversion, low agreeableness, and/or low conscientiousness. However, compared with the other SQ-SF scales, a relatively small amount of variance was accounted for by the FFM domains in the emotional deprivation, self-sacrifice and enmeshment scales. Thus, these schemas may primarily reflect negative views of the self and others and may not be as strongly associated with specific personality tendencies than the other EMS. Findings of the current study seem to be consistent with recent research on the relationships between EMS and the temperament and character dimensions proposed by Cloninger, Svrakic, and Przybeck (1993). Halvorsen et al. (2009) reported positive correlations of EMS with harm avoidance and negative associations with self-directedness, persistence, and cooperativeness. However, according to Young et al. (2003), a vulnerable temperament is not sufficient for the formation of EMS. More important are the ways in which the early environment handles the child's temperament. Future studies should, therefore, focus on the interaction between temperament and adverse relational experiences when investigating the development of EMS. Results from Muris (2006) study and the present findings suggest that the relative impact of temperamental and environmental factors on the development of EMS may vary between different EMS. However, long-term longitudinal studies are needed to answer the question of how adverse relational experiences interact with temperament/personality in the development of EMS. Future research should also address the role of personality traits for other key concepts of ST, i.e., coping styles and schema modes (Lobbestael, Van Vreeswijk, & Arntz, 2008).

The second aim of the present study was to test the hypothesis that EMS predict depressive symptoms above the FFM personality dimensions. Results from regression analysis gave support to this hypothesis, demonstrating that EMS have incremental validity over the FFM in the prediction of depressive symptoms. This finding, although in need of replication, may have implications for the understanding of depression and assessment of depression in clinical practice. The importance of taking into account personality features when treating depression has been proposed (e.g., Bagby, Quilty, & Ryder, 2008; Zinbarg, Uliaszek, & Adler, 2008). However, the finding of the present study suggests that measuring EMS contributes significantly to the understanding of depressive symptoms. EMS reflect dysfunctional conceptualisations of the self and others which also have been shown to be related to depression (Riso et al., 2007), whereas the FFM dimensions represent broad general personality tendencies. It may seem that it is the specific maladaptive cognitive content of EMS that adds to the prediction of depressive symptoms above and beyond normal personality traits. An advantage of assessing EMS in addition to personality traits is that there are numerous cognitive-behavioural techniques for the modification of schemas (Beck, Freeman, Davis, & Associates, 2004; Young et al., 2003), but a lack of specific psychotherapeutic interventions for personality traits, e.g., high neuroticism.

The present study had some limitations that need to be considered. First of all, emotional state may have influenced the description of general personality traits (Widiger & Smith, 2008). In particular, the dimensions of neuroticism and extraversion have shown to be possibly susceptible to the effects of depressive mood with patients describing themselves considerable higher on neuroticism and somewhat lower on extraversion when depressed

(Griens, Jonker, Spinhoven, & Blom, 2002; Wilberg et al., 2009). Further, three EMS from the current schema list are not covered by the SQ-SF (approval-seeking, negativity/pessimism, and punitiveness). Future studies will show how these EMS are related to the FFM. In addition, EMS are, by definition, partly unconscious. For example, according to Young et al. (2003), the emotional deprivation schema is common among patients, but many do not know that they have it. Thus, the SQ-SF measures only the EMS an individual is aware of. Moreover, coping responses to EMS as schema avoidance may have influenced the completion of the inventory. As an alternative to self-report questionnaires, future studies may use projective tests or physiological indicators of information processing in the assessment of EMS (Pretzer & Beck, 2004; Welburn et al., 2002) or a life history approach as applied by Abela et al. (2009). Another limitation that arises from the solely use of self-report measures is that shared method variance might have inflated the correlations between EMS and personality traits. An obvious limitation regards sample composition. The current sample consisted mostly of patients with depression and anxiety disorders, and the generalization of the findings to other populations (e.g., psychiatric inpatients, forensic samples) is unclear. In addition, personality disorders had not been systematically assessed in the present sample.

In conclusion, results of the present study showed a generally high degree of overlap between EMS, as measured by the SQ-SF, and the dimensions of the FFM, neuroticism in particular. EMS contributed significantly to the prediction of depressive symptoms when controlled for the five personality dimensions.

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Paper III

Mediation of early maladaptive schemas between perceptions of parental rearing style and personality disorder symptoms

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ABSTRACT

In schema therapy (ST), early maladaptive schemas (EMS) are proposed to be the defining core of personality disorders. Adverse relational experiences in childhood are assumed to be the main cause for the development of EMS. The present study explored the links between perceived parental rearing behaviours, EMS, and personality disorder symptoms in a clinical sample ($N = 108$). Results from mediation analyses suggest that EMS mediate the relationships between recalled parenting rearing behaviours and personality disorder symptoms. Findings give support to the theoretical model ST is based on.

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1. Background

Schema therapy (ST, Young, Klosko, & Weishaar, 2003) is an integrative treatment for longstanding characterological problems and personality disorders. Building on traditional cognitive therapy (Beck, Rush, Shaw, & Emery, 1979), ST combines elements from Gestalt therapy, attachment theory, constructivist, and psychodynamic therapies to treat patients with personality-related or chronic psychological problems who are not adequately helped by short-term cognitive therapy (Young, 1999). In ST, a subset of schemas, early maladaptive schemas, are proposed to be the defining core of personality disorders (Young & Gluhoski, 1996).

In general, a schema can be described as a prototypical abstraction of a complex concept that is induced from past experiences and guides the organization of incoming information (Thorndyke & Hayes-Roth, 1979). In the context of cognitive therapy, "schemas" and "core beliefs" are often used interchangeable (e.g. Padesky, 1994; Weishaar & Beck, 2006). In ST, an EMS is defined as "a broad, pervasive theme or pattern, comprised of memories, emotions, cognitions, and bodily sensations, regarding oneself and one's relationships with others, developed during childhood or adolescence,

elaborated throughout one's lifetime and dysfunctional to a significant degree" (Young et al., 2003, p. 7). According to Young et al. (2003), EMS arises from the frustration of psychological core needs in childhood (e.g., secure attachment, expression of valid needs, realistic limits) through ongoing patterns of adverse experiences with family members or peers, traumatization, or inappropriate boundaries. A mismatch between parental rearing behaviour and the innate temperament of the child may also lead to the development of EMS. EMS perpetuate themselves through cognitive distortions, self-defeating life patterns, and maladaptive coping styles and lead directly or indirectly to psychological distress and to personality disorders (Young, 1999; Young et al., 2003). EMS are trait-like, but not necessarily activated at every moment. Therefore, in order to conceptualize an individual's current emotional and cognitive state, Young developed the construct of schema modes. Schema modes are sets of schemas and coping responses that are currently active (Young et al., 2003). The schema mode model aims to account for abrupt shifts in mood and behaviour in individuals with severe personality pathology, for example borderline, narcissistic, or anti-social personality disorder (Arntz & van Genderen, 2009; Lobbestael, Arntz, & Sieswerda, 2005; Young et al., 2003).

A number of studies have demonstrated that EMS are significantly related to neglect and abuse in childhood (Cecero, Nelson, & Gillie, 2004) and dimensions of perceived parental rearing styles in different populations (e.g., Harris & Curtin, 2002; Jones, Harris, & Leung, 2005; Leung, Thomas, & Waller, 2000; Meyer & Gillings, 2004;

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Muris, 2006; Shah & Waller, 2000; Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005; Turner, Rose, & Cooper, 2005a, 2005b). For example, Harris and Curtin (2002) found in an undergraduate sample that the EMS defectiveness/shame, insufficient self-control, incompetence/inferiority, and vulnerability were negatively associated with perceptions of parental care. These scales (with the exception of incompetence/inferiority scale) were also related to perceptions of parental overprotection.

On the other hand, empirical studies have confirmed the relevance of EMS with respect to personality disorder symptomatology. For example, axis-II patients have shown to have elevated scores on EMS compared with axis-I patients (Lee, Taylor, & Dunn, 1999; Nordahl, Holthe, & Haugum, 2005). Other studies found specific patterns of EMS for personality disorder categories (Ball & Cecero, 2001; Gude, Hoffart, Hedley, & Ro, 2004; Jovev & Jackson, 2004; Loper, 2003; Petrocelli, Glaser, Calhoun, & Campbell, 2001; Reeves & Taylor, 2007).

Finally, several studies have explored the associations between remembered parental rearing style and axis-II psychopathology (e.g., Head, Baker, & Williamson, 1991; Nickell, Waudby, & Trull, 2002; Nordahl & Stiles, 1997; Norden et al., 1995; Paris & Frank, 1989; Paris, Frank, Buonvino, & Bond, 1991; Parker et al., 1999; Russ, Heim, & Westen, 2003; Timmermann & Emmelkamp, 2005; Yu et al., 2007; Zweig-Frank & Paris, 1991). For example, Timmermann and Emmelkamp (2005) found in a forensic sample that cluster C personality disorders were related to all parental rearing dimensions of the PBI (Parker, Tupling, & Brown, 1979). Cluster A personality disorders were associated with low maternal care and Cluster B negatively with parental overprotection and parental care. Nordahl and Stiles (1997) reported that cluster B pathology were related to paternal overprotection and obsessive–compulsive personality disorder to low paternal care and high paternal overprotection, but there were no significant relations between parental rearing dimensions and cluster A personality disorders, avoidant and dependent personality disorder.

To the present author's knowledge, only one study has explored whether EMS can account for the relations between maltreatment in childhood and personality disorders (Specht, Chapman, & Celluci, 2009). Results suggest that the schema domains disconnection/rejection and impaired limits mediate the relationships between childhood maltreatment and borderline personality disorder symptoms in incarcerated women.

The aim of the present study is to further investigate the links between recollections of parental rearing behaviours, early maladaptive schemas, and personality disorder symptoms. As summarized above, research has shown significant associations between these constructs. However, little research has examined the mediating role of EMS regarding the relations between childhood experiences and adult personality pathology as proposed in schema therapy (Young et al., 2003). Thus, the purpose of the current study is to test the hypothesis that EMS mediate the relations between perceived parental rearing style and personality disorder symptoms.

2. Method

2.1. Participants

Participants were a subset of 149 psychiatric outpatients recruited for a study on the validity of the construct of early maladaptive schemas. Patients were referred by their general practitioners for treatment at the psychiatric outpatient clinics at the Helgeland Hospital Trust Mo i Rana and Levanger Hospital in Norway. In the present study, conducted at a 6-month follow-up, there were 108 participants (75% females) with a mean age of 40.3 years (SD = 12.0, range = 19 - 68). Current marital status was married

(35%), cohabitated (29%), single (23%), divorced/separated (12%), and widowed (1%). Participants were diagnosed by their therapist according to ICD-10 criteria. The most frequent diagnoses in the sample were depressive disorders (44%), social phobias (21%), agoraphobia (15%), panic disorder (10%), posttraumatic stress disorder (10%), dysthymia (7%), disturbance of activity and attention (7%), and generalized anxiety disorder (6%). An estimation of the prevalence of personality disorders among the participants based on the DSM-IV and ICD-10 Personality Questionnaire (Ottoson et al., 1995; described in the measures section below) indicated that 48% met the DSM-IV criteria for at least one cluster A personality disorder (paranoid 40%, schizoid 11%, schizotypal 26%), 37% for a cluster B personality disorder (antisocial 7%, borderline 37%, histrionic 7%, narcissistic 4%), and 67% for a cluster C personality disorder (avoidant 52%, dependent 18%, obsessive-compulsive 48%)

2.2. Measures

The s-EMBU (Arrindell et al., 1999) is a 23-item self-report inventory, designed to measure adults' perceptions of their parents' rearing style. The s-EMBU is a short version of the original 81-item EMBU (Perris, Jacobsson, Lindström, von Knorring, & Perris, 1980) and assesses perceptions of parental rejection, emotional warmth, and overprotection. Items are answered on a four-point Likert scale with reference to father and mother separately. The factor structure of the s-EMBU has been confirmed in different cultures (Arrindell et al., 2005; Arrindell et al., 2001; Arrindell et al., 1999). Studies on the convergent validity of the EMBU/s-EMBU with the Parental Bonding Instrument (PBI; Parker et al., 1979) have shown moderate to strong relations between emotional warmth (as measured with the EMBU) and care (as measured with the PBI) and the overprotection scales of the EMBU and PBI. The EMBU rejection scale was positively associated with PBI overprotection and negatively with PBI care (Arrindell, Gerlsma, Vandereycken, Hageman, & Daeseleire, 1998; Livianos-Aldana & Rojo-Moreno, 1999).

The Schema Questionnaire–Short Form (SQ-SF) measures 15 EMS. The scales consist of the five items with the highest loadings on the 15 factors that emerged in a factor analysis of the long form of the SQ (Schmidt, Joiner, Young, & Telch, 1995). EMS are grouped in five broad domains: disconnection and rejection (abandonment, mistrust, emotional deprivation, defectiveness, social isolation), impaired autonomy and performance (dependence, vulnerability, enmeshment, failure), impaired limits (entitlement, insufficient self-control), other-directedness (subjugation, self-sacrifice, approval-seeking), and overvigilance and inhibition (negativity, emotional inhibition, unrelenting standards, punitiveness). Respondents are asked to rate statements on a six point Likert scale from "completely untrue of me" to "describes me perfectly". The SQ-SF has in different studies shown adequate reliability, validity in predicting psychopathology, and factor structure (e.g., Baranoff, Oei, Ho Cho, & Kwon, 2006; Calvete, Estevez, Lopez de Arroyabe, & Ruiz, 2005; Glaser, Campbell, Calhoun, Bates, & Petrocelli, 2002; Hoffart et al., 2005; Lachenal-Chevallet, Mauchand, Cottreaux, Bouvard, & Martin, 2006; Riso et al., 2006; Stopa, Thorne, Waters, & Preston, 2001; Waller, Meyer, & Ohanian, 2001; Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002).

The DSM-IV and ICD-10 Personality Questionnaire (DIP-Q; Ottoson et al., 1995) was used to assess personality disorder symptoms. Out of 140 self-report items in total, 135 items of the DIP-Q cover the specific diagnostic criteria of all DSM-IV (APA, 1994) personality disorders. Additional five items reflect the general diagnostic criteria of subjective distress and functional impairment. Respondents are asked to score the statements as true or false. Also included in the DIP-Q is a self-report version of the Global Assessment of Functioning (GAF) scale. The authors of the DIP-Q report acceptable levels of internal consistency, test–retest reliability (Ottosson, Grann, &

Kullgren, 2000) and agreement with a structured interview (Ottosson et al., 1998). Since the current study was part of a research project in which participants completed the SQ-SF and other theoretically related measures twice, with a six-month interval, the instruction for the DIP-Q had been slightly changed. In order to make the DIP-Q more sensitive to changes in personality disorder symptomatology, participants were asked to consider the past six months when responding to the items (versus the past five years in the original instruction).

The Beck Depression Inventory (BDI; Beck et al., 1979) is a 21-item self-report measure designed to assess the severity of depressive symptomalogy. Affective, cognitive, motivational, and physiological symptoms of depression are rated from 0 to 3 in terms of their intensity. The BDI is scored by summing the responses to all items. The BDI has been shown to have adequate psychometric properties (Beck, Steer, & Garbin, 1988).

2.3. Procedure

Patients at the two clinics who did not meet the exclusion criteria for the study (acute psychosis, mental retardation, or insufficient reading skills) received information about the study from their therapists, and signed, if interested, an informed consent form. The instruments were then mailed to the participants for completion at home. Participation was rewarded with a lottery ticket.

The study has been approved by the Regional Committee for Medical Research Ethics for Northern Norway and the Norwegian Social Science Data Services regarding the collection and storage of patient information.

2.4. Statistical analyses

Pearson correlations between parental rearing dimensions, schema domains, and personality disorder symptoms were computed. Next, a series of multiple mediation analyses were conducted to test the hypothesis that EMS mediate the relationships between parental rearing style and personality disorder symptoms. Generally, in mediation analysis different effects are assessed. The total effect of an independent variable (IV) on a dependent variable (DV) is composed of the direct effect of the IV on the DV and the indirect effect through a proposed mediator variable. In the case of multiple mediation, the total indirect effect of all proposed mediators and the specific indirect effect of each single mediator can be estimated. In the current study, the direct and indirect effects of three parental rearing dimensions (i.e., paternal and maternal rejection,

emotional warmth, and overprotection) on three DSM-IV clusters of personality disorder symptoms through five schema domains were examined. Since the DIP-Q has been shown to be susceptible to the impact of depression (Ottosson et al., 2000) and the altered instruction of the DIP-Q in the present study further enhanced the probability of reporting personality disorder symptoms due to depressed mood, the effects of depressive symptoms were controlled for in the analyses by including BDI scores as covariates.

Following the recommendations by Preacher and Hayes (2008), Shrout and Bolger (2002), and MacKinnon, Lockwood, and Williams (2004), a bootstrapping sampling procedure was applied for assessing indirect effects. In short, bootstrapping is a nonparametric resampling procedure where a large number of samples (5000 in the current study) are drawn with replacement from the full data set. Based on these samples, approximations of the distribution of the indirect effects are obtained and point estimates and confidence intervals calculated. In multiple mediation models, this procedure allows to estimate the indirect effect of a mediator controlling for other potential mediators. According to Preacher and Hayes (2008) and MacKinnon et al. (2004), the bootstrapping procedure is superior to the product of coefficients approach or Sobel test and the commonly used Baron and Kenny (1986) causal steps approach in terms of statistical power while maintaining reasonable control over Type I error. In addition, bootstrapping is recommended when the assumption of normality of the sampling distribution is questionable, as it may be the case in comparatively small samples (Preacher & Hayes, 2008; Shrout & Bolger, 2002). In the present study, the bootstrap procedure was conducted using the SPSS macro provided by Preacher and Hayes (2008). A point estimate for an indirect effect (total or specific) was considered significant if zero was not included in the 95% bias-corrected confidence interval.

3. Results

3.1. Correlational analyses

Bivariate correlations between dimensions of remembered parental rearing styles, schema domains, and personality disorder symptoms are displayed in Table 1. Since five participants reported that they grew up without a father figure, sample size for maternal and paternal scales differed slightly. As shown in Table 1, Cluster A and B symptoms were associated with parental rejection and (negatively) with maternal emotional warmth. Cluster C symptoms were significantly correlated with paternal rejection. All five schema domains were related to paternal rejection and four of five domains

Table 1
Correlations between EMBU scales, SQ-SF schema domains, personality disorder symptoms (DIP-Q), and BDI scores.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Paternal rejection	–													
2. Maternal rejection	0.45***	–												
3. Paternal emotional warmth	−0.64***	−0.26**	–											
4. Maternal emotional warmth	−0.29**	−0.70***	0.53***	–										
5. Paternal overprotection	0.33***	0.20*	0.02	0.08	–									
6. Maternal overprotection	0.17	0.21*	0.08	0.06	0.74***	–								
7. Disconnection and rejection	0.33***	0.39***	−0.16	−0.28**	0.07	0.06	–							
8. Autonomy and performance	0.35***	0.25**	−0.14	−0.18	0.147	0.09	0.75***	–						
9. Other-directedness	0.21*	0.36***	−0.01	−0.22*	0.14	0.13	0.59***	0.60***	–					
10. Vigilance and overinhibition	0.22*	0.24*	−0.10	−0.22*	0.10	0.13	0.55***	0.63***	0.38***	–				
11. Impaired limits	0.29**	0.18	0.02	−0.02	0.17	0.11	0.52***	0.55***	0.30**	0.44***	–			
12. Cluster A symptoms	0.27**	0.33***	−0.17	−0.26*	0.16	0.16	0.62***	0.56***	0.36***	0.50***	0.47***	–		
13. Cluster B symptoms	0.29**	0.33***	−0.11	−0.22*	0.15	0.13	0.57***	0.48***	0.36***	0.32***	0.62***	0.58***	–	
14. Cluster C symptoms	0.21*	0.13	−0.15	−0.16	0.09	0.09	0.52***	0.53***	0.34***	0.43***	0.29**	0.56***	0.39***	–
15. BDI	0.17	0.22*	−0.10	−0.18	0.05	0.03	0.56***	0.54***	0.44***	0.41***	0.32***	0.51***	0.42***	0.48***

*$p < 0.05$.** $p < 0.01$.*** $p < 0.001$. $N = 103$–108.

(except the impaired limits domain) with maternal rejection. In addition, the disconnection and rejection, other-directedness, and vigilance and overinhibition domains were negatively associated with maternal emotional warmth. All schema domains were significantly related to both cluster A, B, and C personality disorder symptoms. Finally, BDI scores were significantly correlated with maternal rejection, the five schema domains, and three clusters of personality disorder symptoms.

3.2. Mediational analyses

Results of mediational analyses for cluster A symptoms are presented in Table 2. Significant total indirect effects were found for paternal and maternal rejection and low maternal emotional warmth. As shown in Table 2, there were no significant direct effects. The disconnection and rejection schema domain was a significant ($p < 0.05$) mediator between parental rejection and low maternal warmth and cluster A personality disorder symptoms (i.e., had a significant specific indirect effect when controlling for the remaining schema domains).

Table 3 displays results of mediational analyses for cluster B symptoms. Maternal rejection and low maternal emotional warmth had a significant direct effect on cluster B symptoms, indicating that schema domains only partially mediate the relationships. The specific indirect effect of parental rejection and low maternal emotional warmth on Cluster B personality disorder symptoms through the disconnection and rejection schema domain was significant ($p < 0.05$). In addition, the impaired limits schema domain was a significant mediator between paternal rejection and cluster B symptoms.

Results of mediational analyses for cluster C symptoms are summarized in Table 4. No significant direct effects of parental rearing dimensions on cluster C personality disorder symptoms were found. The total indirect effects through schema domains were significant for parental rejection. The disconnection and rejection domain was significantly mediating between paternal and maternal rejection and low maternal emotional warmth and cluster C personality disorder symptoms.

4. Discussion

The present study examined the relationships between remembered parental rearing behaviours, early maladaptive schemas, and personality disorder symptoms in a clinical sample. In addition to correlational analyses, a series of multiple mediation analyses were conducted in order to test the hypothesis that EMS mediate the relationships between adverse childhood experiences and personality disorder symptoms.

In line with previous research, results indicated significant associations between recalled parental rearing style and both EMS and personality disorder symptoms in adults. Rejection from both parents and less emotional warmth from mother were significantly related to cluster A and B personality pathology, whereas cluster C symptoms were associated with paternal rejection. In contrast to the Nordahl and Stiles (1997) and Timmermann and Emmelkamp (2005) studies, parental overprotection was not significantly related to personality disorder symptomatology in the present study. With respect to early maladaptive schemas, all five schema domains were significantly related to paternal and (except for the impaired limits schema domain) maternal rejection. The disconnection/rejection, other-directedness, and vigilance/overinhibition domains were associated with less maternal emotional warmth. Contrary to the findings of Harris and Curtin (2002) and Leung, Thomas, and Waller (2000), parental overprotection was not significantly

Table 2
Mediation of the effect of perceived parental rearing on cluster A personality disorder symptoms through schema domains when controlled for depressive symptoms.

Independent variable	Total effect	Direct effect	Total indirect effect			Specific indirect effects															
						Disconnection			Autonomy.			Other-directedness			Vigilance.			Impaired limits			
			Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		
				Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Paternal rejection	0.1401*	0.0366	0.1035*	0.0322	0.1854	0.0733*	0.0253	0.1526	−0.0178	−0.1062	0.0288	−0.0083	−0.0526	0.0178	0.0256	−0.0032	0.0947	0.0307	−0.0006	0.1049
Maternal rejection	0.1713*	0.0792	0.0921*	0.0121	0.1849	0.0772*	0.0247	0.1667	−0.0072	−0.0752	0.0186	−0.0164	−0.0679	0.0339	0.0240	−0.0035	0.0929	0.0145	−0.0051	0.0648
Paternal emot. warmth	−0.1123	−0.0775	−0.0347	−0.1158	0.0493	−0.0339	−0.1145	0.0088	0.0032	−0.0136	0.0537	−0.0010	−0.0298	0.0135	−0.0100	−0.0722	0.0122	0.0069	−0.0185	0.0538
Maternal emot. warmth	−0.1626*	−0.1007	−0.0618	−0.1590	0.0276	−0.0576*	−0.1547	−0.0085	0.0040	−0.0130	0.0536	0.0083	−0.0187	0.0556	−0.0222	−0.0942	0.0050	0.0057	−0.0209	0.0579
Paternal over-protection	0.0908	0.0572	0.0336	−0.0494	0.1220	0.0159	−0.0410	0.0931	−0.0068	−0.0602	0.0102	−0.0069	−0.0579	0.0116	0.0109	−0.0072	0.0620	0.0206	−0.0031	0.0852
Maternal over-protection	0.1273	0.0895	0.0378	−0.0476	0.1277	0.0144	−0.0369	0.0798	−0.0005	−0.0266	0.0127	−0.0068	−0.0571	0.0107	0.0159	−0.0048	0.0766	0.0149	−0.0059	0.0695

$*p < 0.05$. $**p < 0.01$. Point est. = Point estimate. BC 95% CI = Bias-corrected 95% confidential interval. $N = 103$–108.

Table 3
Mediation of the effect of perceived parental rearing on cluster B personality disorder symptoms through schema domains when controlled for depressive symptoms.

Independent variable	Total effect	Direct effect	Total indirect effect			Specific indirect effects															
						Disconnection			Autonomy			Other-directedness			Vigilance			Impaired limits		
			Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI	
				Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Paternal rejection	0.2476*	0.0383	0.2114*	0.0382	0.4314	0.0626*	0.0173	0.1357	−0.0359	−0.1516	0.0236	−0.0007	−0.0385	0.0352	−0.0133	−0.0682	0.0088	0.1986*	0.0305	0.4258
Maternal rejection	0.3085**	0.2042**	0.1043	−0.0657	0.2915	0.0571*	0.0091	0.1418	−0.0225	−0.1033	0.0100	−0.0040	−0.0560	0.0487	−0.0153	−0.0774	0.0048	0.0890	−0.0497	0.2607
Paternal emotional warmth	0.0224	−0.0009	0.0233	−0.1626	0.1759	−0.0315	−0.1070	0.0111	0.0093	−0.0156	0.1000	0.0010	−0.0127.	0.0337	0.0050	−0.0095	0.0540	0.0397	−0.1431	0.1855
Maternal emotional warmth	−0.1606	−0.1731	−0.0125*	−0.1693	0.2293	−0.0464*	−0.1358	−0.0019	0.0132	−0.0098	0.0785	−0.0030	−0.0654	0.0221	0.0160	−0.0065	0.0785	0.0327	−0.1359	0.2291
Paternal over-protection	0.1235	−0.0112	0.1348	−0.0401	0.3615	0.0132	−0.0343	0.0820	−0.0136	−0.1091	0.0098	−0.0002	−0.0333	0.0297	−0.0057	−0.0463	0.0062	0.1410	−0.0109	0.3555
Maternal over-protection	0.1466	0.0413	0.1053	−0.0749	0.3280	0.0126	−0.0339	0.0703	−0.0022	−0.0579	0.0223	0.0032	−0.0225	0.0471	−0.0091	−0.0570	0.0065	0.1009	−0.0526	0.3207

*$p < 0.05$. **$p < 0.01$. Point est. = Point estimate. BC 95% CI = Bias-corrected 95% confidential interval. $N = 103–108$.

correlated with EMS in the present sample. One reason for discrepant findings regarding the role of parental overprotection and EMS and personality disorders may be the use of different measures of parental rearing dimensions. In the present study, the s-EMBU was applied, whereas the former studies used the PBI (Parker et al., 1979). However, despite convergent validity between the PBI and the EMBU (Arrindell et al., 1998), these instruments can not be considered interchangeable (Livianos-Aldana & Rojo-Moreno, 1999). Differences between the PBI and the s-EMBU may have contributed to diverging findings.

The present study further examined the mediational role of EMS between perceived parental rearing and personality disorder symptoms. In schema therapy (Young et al., 2003), it is proposed that EMS are the defining core of longstanding characterological problems and personality disorders. According to Young (1999), the main causal factor in the development of EMS are early noxious relational experiences that are repeated in a regular manner. Therefore, a series of mediational analyses were conducted. Results showed that EMS were significant mediators between remembered parental rearing behaviours and personality disorder symptoms when the effect of depression was controlled for. More specifically, with respect to cluster A and C symptoms significant indirect effects through EMS were found for parental rejection and low levels of maternal warmth. Regarding cluster B symptoms, EMS mediated the relationships with parental rejection. However, significant direct effects of maternal rejection and less maternal emotional warmth were also found. In other words, EMS only partially mediated these relationships. When a mediating effect of EMS was found, the disconnection and rejection schema domain emerged as a significant individual mediator. The disconnection and rejection domain comprises EMS that involve the expectation that one's needs for security, safety, nurturance, and respect will not be met. In addition, the indirect effect of paternal rejection on cluster B symptoms through the impaired limits schema domain was significant. Schemas in the impaired limits domain involve deficiencies in internal limits, responsibility to others, or long-term goal-orientation. The significant mediating effect of the impaired limits domain seems to be consistent with theoretical considerations (e.g., Looper & Paris, 2000) and empirical findings (e.g., Bagby, Costa, Widiger, Ryder, & Marshall, 2005) that suggest that impulsivity (i.e., the tendency to act without considering alternatives or consequences) is a common defining characteristic of cluster B personality disorders. Furthermore, the findings with respect to cluster B personality disorder symptoms are consistent with the results from the Specht et al. (2009) study where the disconnection/rejection and impaired limits domains were found to mediate the relationship between childhood maltreatment and borderline personality disorder symptoms. In summery, in line with Young's (1999) schema model, findings from mediational analyses suggest that the effects of childhood maltreatment on personality disorder symptoms in adulthood are mediated and maintained by early maladaptive schemas.

However, results regarding specific indirect effects must be interpreted cautiously. Despite nonsignificant multicollinearity statistics, specific indirect effects are probably attenuated due to relatively high intercorrelations between the schema domains (cf., Preacher & Hayes, 2008). As a result, schema domains that could be hypothesized to have a significant indirect effect, as for example the other-directedness and vigilance domains for cluster C personality disorder symptoms, may not have emerged as significant individual mediators in the present study. In addition, some other study limitations warrant consideration. First, measurement of parental rearing behaviours was based on retrospective reports which might be susceptible to a number of biasing influences, e.g., mood state,

Table 4
Mediation of the effect of perceived parental rearing on cluster C personality disorder symptoms through schema domains when controlled for depressive symptoms.

Independent variable	Total effect	Direct effect	Total indirect effect			Specific indirect effects															
						Disconnection			Autonomy			Other-directedness			Vigilance			Impaired limits			
			Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		Point est.	BC 95% CI		
				Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Paternal rejection	0.1072*	0.0129	0.0942*	0.0183	0.1843	0.0491*	0.0020	0.1264	0.0375	-0.0304	0.1226	-0.0075	-0.0608	0.0224	0.0197	-0.0109	0.0941	-0.0045	-0.0560	0.0541
Maternal rejection	0.0266	-0.0865	0.1131*	0.0196	0.2202	0.0769*	0.0134	0.1843	0.0148	-0.0251	0.0897	-0.0010	-0.0584	0.0692	0.0264	-0.0056	0.1052	-0.0038	-0.0552	0.0163
Paternal emotional warmth	-0.1148	-0.0693	-0.0454	-0.1399	0.0484	-0.0282	-0.1140	0.0066	-0.0057	-0.0788	0.0210	-0.0005	-0.0304	0.0173	-0.0100	-0.0807	0.0157	-0.0011	-0.0375	0.0173
Maternal emotional warmth	-0.0806	0.0030	-0.0837	-0.2022	0.0052	-0.0527*	-0.1726	-0.0016	-0.0091	-0.0832	0.0158	0.0039	-0.0308	0.0541	-0.0245	-0.1093	0.0102	-0.0012	-0.0441	0.0152
Paternal over-protection	0.0803	0.0575	0.0229	-0.0509	0.1128	0.0107	-0.0233	0.0741	0.0150	-0.0105	0.1013	-0.0064	-0.0676	0.0141	0.0083	-0.0102	0.0618	-0.0048	-0.0608	0.0305
Maternal over-protection	0.0827	0.0618	0.0209	-0.0641	0.1061	0.0120	-0.0274	0.0828	0.0016	-0.0242	0.0563	-0.0041	-0.0572	0.0202	0.0163	-0.0085	0.0834	-0.0049	-0.0582	0.0186

*$p < 0.05$. Point est. = Point estimate. BC 95% CI = Bias-corrected 95% confidential interval. N = 103–108.

general limitations in memory (e.g., childhood amnesia, passing of time), or self-verification processes (Brewin, Andrews, & Gotlib, 1993; Gerlsma, 1994). Furthermore, it can be argued that memories of parental rearing behaviours reflect *perceived* parental behaviours rather than *actual* behaviours (Gerlsma, 1994). However, recollections of parental rearing style have been shown to be highly stable across time despite of changes in mood state (e.g., Lizardi & Klein, 2005; Richter & Eisemann, 2000). More importantly, the child's experience of parental behaviours may be more important for its development than objectively measured parental characteristics (Parker, 1989). Second, self-report measures of EMS and personality disorder symptoms were used in the present study. Although the SQ-SF is well validated, EMS are, by definition, partly unconscious (Young, 1999), and an individual may therefore not be aware of having an EMS. In addition, maladaptive coping responses to a particular schema (e.g., schema avoidance) may influence the completion of a self-report inventory. With regard to the assessment of personality disorder symptoms, self-report instruments have a tendency to overdiagnose personality pathology (Widiger & Samuel, 2005). Third, with respect to sample composition, the current sample consisted mostly of patients with depression and anxiety disorders, and the generalization of the findings to populations with personality disorders is unclear. Fourth, although results of the study suggest that parental rearing behaviours influences the development of EMS, which in turn increases the individual's vulnerability to develop personality disorder symptoms, no causal inferences can be made due to the cross-sectional design of the study.

Future research should examine the relations between parental rearing styles, EMS, and personality disorders using a prospective design. Personality disorders should be assessed by a structured or semi-structured interview (e.g., SCID II, IPDE). A larger sample size would allow for more fine-grained analyses, i.e., of the relations between specific EMS (instead of schema domains) and the particular personality disorder categories (instead of cluster of personality disorder symptoms). Finally, a broader range of influences in childhood on personality development should be included in the analyses, e.g., measures of childhood trauma, bullying, etc.

In conclusion, in line with previous research, significant associations between perceived parental rearing behaviours, early maladaptive schemas, and personality disorder symptoms were found in the present study. Results suggest that EMS mediate the relationships between remembered parental rearing styles and personality disorder symptoms. Findings provide support for the theoretical model schema therapy is based on.

Acknowledgement

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