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A new look at the schema therapy model: organization and role of early maladaptive schemas

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ABSTRACT

This study reexamined the organization of Young's 18 early maladaptive schemas and their hypothesized associations with experiences of need-thwarting parental experiences in childhood and the "vulnerable child" mode of emotional distress in adulthood. A large Danish sample ($N = 1054$) of 658 clinical- and 391 nonclinical adults completed measures of early maladaptive schemas, parenting styles, and the vulnerable child mode. We identified four higher-order schema domains as most appropriate in terms of interpretability and empirical indices ("Disconnection & Rejection", "Impaired Autonomy & Performance", "Excessive Responsibility & Standards", and "Impaired Limits"). All four schema domains were differentially associated with conceptually relevant need-thwarting parental experiences. Apart from "Impaired Limits", the schema domains meaningfully accounted for the association between need-thwarting parental experiences in childhood and emotional states of feeling like a "vulnerable child" in adulthood. We conclude that four domains of early maladaptive schemas are empirically and conceptually consistent with Young's schema therapy model of personality pathology and longstanding emotional disorders. Findings warrant replication using different populations and if possible a prospective multi-method design. A scoring key for computing the four schema domains is provided.




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In recent years, Schema Therapy (ST) has been increasingly used for conceptualization and treatment of long-lasting emotional disorders and personality pathology (Jacob & Arntz, 2013). Moreover, research suggests that focus on schemas may be especially efficacious for patients with personality disorders and other longstanding emotional problems including chronic or recurrent depression and anxiety (Hawke & Provencher, 2011; Keefe, Webb, & DeRubeis, 2016). ST is an integrative and multi-modal approach sharing essential features with Cognitive Behavioral Therapy, Object Relations Theory, Gestalt Therapy, Transactional Analysis, Mentalization-Based Therapy, Dialectical Behavior Therapy, and Positive Psychology (Chard et al., 2005; Lockwood & Shaw, 2012; Montgomery-Graham,

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2016; Taylor & Arntz, 2016), which potentially makes it appeal to therapists from a broad range of orientations. During the past three decades, the ST model has evolved into an approach that focuses on unmet emotional needs causing the development of early maladaptive schemas (EMS), which typically are manifested as the experience of being in a “vulnerable child” mode (a detailed explanation of this mode is provided in a separate section). Accordingly, the essence of ST treatment involves *limited re-parenting*¹ and helping patients meet their own needs, which is hypothesized to facilitate corrective emotional experiences that restore the vulnerable and needy “child” while modifying underlying EMS and dysfunctional styles of coping (Rafaeli, Bernstein, & Young, 2011). The scope of the present article was to investigate and discuss the higher order organization and role of 18 *early maladaptive schemas* (EMS) in relation to childhood experiences of *need-thwarting parental behavior* and current experiences of being in a *vulnerable child mode*. Those three interlinked concepts will be defined below, while emphasizing the hypothesized core role of EMS.

Emotional core needs

With inspiration from attachment theory (Bowlby, 1977), the ST model emphasizes that all individuals are born with core emotional needs which are present in all children with some variation: (1) Secure attachments to others, including safety, stability, nurturance, and acceptance; (2) Autonomy, competence, and sense of identity; (3) Freedom to express valid needs and emotions; (4) Spontaneity and play; (5) Realistic limits and self-control (Young, Klosko, & Weishaar, 2003).² This universal perspective is reflected in the United Nations Convention on the Rights of the Child with the aim of “Recognizing that the child, for the full and harmonious development of his or her personality, should grow up in a family environment, in an atmosphere of happiness, love and understanding” (UN, 1989). The interaction between the child’s biological temperament and early toxic environments (e.g. parental neglect and abuse) are believed to result in the frustration of these basic needs, which is hypothesized to cause elevated vulnerability and emotional neediness in adult life (Flanagan, 2010; Young et al., 2003). An individual with a healthy personality is, therefore, one who had these needs met in childhood resulting in the development of a healthy functioning self in relation to others including a capacity for ongoing fulfillment of the adult variants of core needs. The goal of ST is to help patients find adaptive ways to have their emotional needs met. Thus, emotionally and interpersonally desperate individuals with personality pathology are not considered *greedy*, but *needy*. It is not clear which negative experiences in childhood or adolescence are the most central causative factors, though experiences related to the parental figures are considered the most important determinants during early childhood (Young et al., 2003). Basically, the unsatisfactory completion of developmental needs (e.g. abuse and neglect) in interaction with inborn temperament is assumed to lead to personality pathology through the early formation of EMS.

Early maladaptive schemas

Early maladaptive schemas (referred to as “EMS”) are defined as broad pervasive themes regarding oneself and one’s relationship with others, developed during childhood and elaborated throughout one’s lifetime, and are dysfunctional to a significant degree

(Young et al., 2003). This may involve internalized need-thwarting experiences such as a toxic family climate, repetitive low-grade traumas, acute trauma, neglect, over indulgence or over protection. A schema has different degrees of pervasiveness and severity: the more pervasive, the greater the number of situations that trigger it. Likewise, the more severe, the more intense the negative emotion when the schema is triggered (Young et al., 2003).

In the initial ST model, EMS were clustered in five domains named after the need-thwarting themes that were theorized to have contributed to their development.³ However, further empirical studies do not support this five-domain structure, whereas a four factor model generally emerges as more sound (e.g. Kriston, Schäfer, von Wolff, Härter, & Hölzel, 2012; Lockwood & Perris, 2012). As we will review later in the manuscript, the most recent ST model includes 18 EMS of which the most are clustered in four domains consistent with preliminary empirical findings and ST theory: (1) Disconnection and Rejection, (2) Impaired Autonomy and Performance, (3) Excessive Responsibility and Standards, and (4) Impaired Limits (Lockwood & Perris, 2012; Young, 2014; see overview in supplemental Appendix A).

Cross-sectional and prospective studies have demonstrated substantial associations between most EMS and measures of attachment/childhood traumas (Blissett et al., 2006; Cecero, Nelson, & Gillie, 2004; Simard, Moss, & Pascuzzo, 2011). Moreover, various studies have demonstrated that EMS are associated with personality pathology (e.g. Bach, Lee, Mortensen, & Simonsen, 2016; Bach, Simonsen, Christoffersen, & Kriston, 2017; Jovev & Jackson, 2004). Finally, a number of studies suggest that most EMS play a mediating role in the link between childhood adversities and personality disorders (e.g. Carr & Francis, 2010; Thimm, 2010).

The Vulnerable Child Mode

While EMS are considered to be underlying enduring psychological themes, modes are rather moment-to-moment fluctuating features of personality pathology comprising activated sets of EMS and coping responses (sometimes conceptualized as dysfunctional and dissociated parts of the personality). The mode concept was originally introduced in ST by Jeffrey E. Young and Michael B. First (2003) in order to conceptualize the somewhat shifting features of more severe personality pathology. The “vulnerable child” is the mode that usually experiences most of the core EMS causing the person to experience feelings of being a lost, wounded, abused, or frightened child. Other terms such as sad, hopeless, abandoned, anxious, helpless, or overwhelmed may be used depending on activated EMS, e.g. the “emotionally deprived child”, “the abandoned child” or “the abused child” (in which EMS of emotional deprivation, abandonment or mistrust/abuse may predominate). Consequently, because the Vulnerable Child Mode holds most schemas we regard it as the core mode for the purpose of ST. Moreover, the Vulnerable Child Mode provides the clearest and most unequivocal manifestation of unmet needs and of their emotional consequences; this mode is the part of the person experiencing vulnerability and an inability to sooth and stabilize oneself (Rafaeli et al., 2011). Thus, this is the mode schema therapists are most concerned with helping by providing it with emotional nutriment such as soothing, validation, reassurance, and praise (i.e. emotional needs). In return, these experiences of “re-parenting” are thought of as being internalized and thereby building up the healthy and self-soothing adult part of the patient (Lockwood & Perris, 2012).

Previous research has found the Vulnerable Child Mode to be particularly associated with internalizing aspects of PDs according to DSM-5 Section II (Bach & Farrell, 2018; Lobbestael, Van Vreeswijk, & Arntz, 2008) and Section III (Bach et al., 2016), but also features of dissociation (Johnston, Dorahy, Courtney, Bayles, & O’Kane, 2009), loneliness (Lobbestael, van Vreeswijk, Spinhoven, Schouten, & Arntz, 2010), general mental distress (Reiss, Krampen, Christoffersen, & Bach, 2017), and demoralization (Khalily, Wota, & Hallahan, 2011). Moreover, research has demonstrated that the vulnerable child mode is associated with interview-rated childhood abuse in patients with personality disorders (Lobbestael, Arntz, & Sieswerda, 2005).

Existing research on the empirical organization of EMS

To date, factor analytical evaluations of the higher order organization of EMS have shown mixed findings by supporting the existence of two, three, four, and five higher order schema domains, of which the four-factor model is most consistent across studies (see overview in Kriston et al., 2012; Lockwood & Perris, 2012). Notably, most of these studies used older versions of the Young Schema Questionnaire, which only measure 15 EMS with a non-randomized item format. In recent years, the higher order structure of all 18 EMS has been investigated in Spanish (Calvete, Orue, & González-Diez, 2013), French-Canadian (Hawke & Provencher, 2012), Turkish (Saritas & Gencöz, 2011; Soygüt, Karaosmanoglu, & Cakir, 2009), Hungarian (Csukly et al., 2011), Finish (Saariaho, Saariaho, Karila, & Joukamaa, 2009), and Thai (Sakulsriprasert, Phukao, Kanjanawong, & Meemon, 2016) samples. These studies used different analytical approaches and resulted in somewhat mixed findings, but predominantly supported a 4 factor model. Based on theory and most of the aforementioned findings, Young and colleagues have proposed a revised model in which 15 of the 18 EMS are grouped into 4 “schema clusters” (see supplemental Appendix A), which aligns with the model proposed in Figure 2. There is not enough research yet to have a clear sense of how the 3 unclustered EMS (“Pessimism”, “Approval/Admiration-seeking”, and “Punitiveness”) are meaningfully organized within the four-domain framework as they were not added to the ST model until the 3rd edition of the Young Schema Questionnaire (Lockwood & Perris, 2012; Young, 2014). Therefore, further examination of this most recently proposed 4-domain model of 18 EMS is warranted, including investigation of theorized associations with unmet childhood needs and the vulnerable child mode. The current study served to fill these gaps.

Goal of the current study

The goal of the present study was to examine the empirical organization of EMS and their proposed role in the ST model of personality pathology. Accordingly, our objectives were (1) to explore the hierarchical structure of EMS from 1 to 5 components in order to establish their most sound higher order organization; (2) to investigate unique associations between recollected need-thwarting parenting and current EMS; (3) to examine mediational paths among recollected parenting styles, EMS, and the vulnerable child mode.

The overall findings are expected to provide some evidence for a conceptually and empirically sound higher order organization of all 18 EMS (including the most recently added

“Approval/Admiration-Seeking”, “Pessimism”, and “Punitiveness”), which may be employed in future research and further development of the ST model.

Method

Measures

In the current study dysfunctional parenting styles were investigated in terms of retrospectively self-reported parental behavior during childhood (i.e. primary care takers), EMS were measured in terms of self-reported intensity of enduring core themes, and the vulnerable child mode was measured in terms of self-reported frequency of certain responses and emotional states.

Young Parenting Inventory – Revised (YPI-R; Sheffield, Waller, Emanuelli, Murray, & Meyer, 2006) was used to measure 9 need-thwarting parenting styles (see supplemental Table S1).⁴ The YPI-R is a 2×37 -items inventory in which the respondent is rating the behavior of his or her parental figures during childhood (a total of 74 items). Respondents were required to rate each item on a six-point scale (from “completely untrue” to “describes him/her perfectly”) for their mother/female authority figure and father/male authority figure, respectively. The factorial validity of the 9 YPI-R scales has been supported (Sheffield et al., 2006). Alpha coefficients of the YPI-R scales in the present study ranged from $\alpha = .69$ (father’s perfectionist parenting) to $\alpha = .94$ (fathers’s belittling and emotionality depriving parenting), and had a median of $\alpha = .82$ for both mothers and fathers, separately (see supplemental Table S2).

Young Schema Questionnaire – Short Form 3 (YSQ-S3; Young, 2005) was used to measure the 18 EMS (see supplemental Table S1). The YSQ-S3 is a 90-item self-report inventory profiling the *intensity* of 18 EMS. Accordingly, respondents were required to rate each item on a six-point scale (from “completely untrue of me” to “describes me perfectly”). The factorial validity and internal consistencies of the 18 Danish YSQ-S3 scales have been confirmed in correspondence with the schema therapy model and previous findings (Bach, Simonsen, Christoffersen, & Kriston, 2017). Alpha coefficients of the YSQ-S3 scales in the present study ranged from $\alpha = .71$ (Entitlement) to $\alpha = .91$ (Defectiveness; Mistrust/Abuse), and had a median of $\alpha = .84$ (see supplemental Table S3).

Vulnerable Child Mode-subscale of the *Schema Mode Inventory*⁵ (SMI; Lobbestael et al., 2010) was used to measure the Vulnerable Child Mode (see supplemental Table S1). This scale comprises 10 items, measuring the *frequency* of being in a vulnerable child mode. Accordingly, respondents were required to rate each item on a 6-point scale (from “never or almost never” to “all of the time”). The factorial validity and internal consistency of the Danish version of this scale has been confirmed (Reiss et al., 2016). In the current study, the vulnerable child mode scale had an alpha coefficient of .95.

Participants and procedures

A mixed sample of Danish adults ($N = 1049$; 77% women; $M_{\text{age}} = 29.66$; $SD_{\text{age}} = 9.38$; Range 18–67 years) were included in the present study, of which 658 (63%) were clinical participants and 391 (37%) were nonclinical participants. Data were collected from March 2012 to February 2016 and have partially been used in Bach et al. (2017) and Reiss et al. (2016).

All these participants were administered the YSQ-S3 and the SMI *Vulnerable Child Mode* subscale. The clinical sample was composed of 592 non-psychotic psychiatric outpatients and 66 rehabilitants in treatment for drug/alcohol abuse, and all had predominant features of personality pathology (primarily Cluster B and C personality disorders). The nonclinical sample was composed of 221 community-dwelling participants and 170 college students.

A mixed subsample of the aforementioned participants ($n = 850$; 62% clinical participants; 80% women; $M_{\text{age}} = 28.93$; $SD = 8.73$; Range 17–56 years) also completed the YPI-R in order to measure childhood experiences of need-thwarting parenting. This subsample did *not* include the 65 rehabilitants in treatment for drug/alcohol abuse and 71 of the students as they did not have access to the YPI-R.

As a routine part of their clinical evaluation program, all clinical participants were consecutively included in the study in terms of a naturalistic design. All clinical participants met the criteria for at least one DSM-5 nonpsychotic disorder based on clinical evaluation by a mental health professional. The most prevalent diagnoses were one or more Cluster B and Cluster C personality disorders, along with co-occurring anxiety, depressive, substance/alcohol abuse, and eating disorders. Clinical participants suspected of having a current psychotic disorder, severe depression, organic disorder, or autism were not included.

Nonclinical participants were recruited by means of convenience sampling using college intranet ads and personal letter invitations to the general community (i.e. 1250 randomly extracted local citizens from the Danish Civil Registration System, of which 221 completed the assessment program). Data were collected using secure online self-report software. All participants provided informed consent, and the study was approved by a local ethical committee.

Hypotheses

Hypothesis 1: From existing literature we hypothesized that four higher-order schema domains would emerge as most appropriate in terms of empirical structure and theoretical coherence: (1) Disconnection & Rejection, (2) Impaired Autonomy & Performance, (3) Excessive Responsibility & Standards, and (4) Impaired Limits. (see supplemental Appendix A)

Hypothesis 2: We expected that specific recollected parenting styles would be associated with schema domains in a theoretically coherent manner corresponding to particular emotional needs that were not met (cf. supplemental Table S1). Accordingly, we predicted that the schema domain of Disconnection & Rejection is primarily associated with Emotionally Depriving Parenting; the schema domain of Impaired Autonomy & Performance is primarily associated with Overprotective and Controlling Parenting; the schema domain of Excessive Responsibility & Standards is primarily associated with Perfectionistic Parenting; the schema domain of Impaired Limits is primarily associated with Conditional/Narcissistic and Overprotective Parenting. (Rafaeli et al., 2011; Young et al., 2003)

Hypothesis 3: Based on theoretical propositions and conceptual coherence we proposed a series of parallel mediation models in which particular schema domains mediate the association between designated parenting styles with the vulnerable child mode: First, we expected that the domain of Disconnection & Rejection would mediate the association of Emotionally Depriving Parenting and Belittling Parenting with the Vulnerable Child Mode. Secondly, we expected the domain of Impaired Autonomy & Performance to mediate the association between Overprotective Parenting and the Vulnerable Child Mode. Third, we expected the domain of Excessive Responsibility & Standards⁶ to mediate some of the association between

Perfectionistic Parenting and the Vulnerable Child Mode. (through an anticipated internalized “Demanding Parenting Mode”)

According to ST theory we did *not* anticipate the domain of Impaired Limits to mediate the association between parenting and the vulnerable child mode, as the EMS of entitlement, approval/admiration-seeking, and insufficient self-control (which are predominant for this domain) are usually not related to the Vulnerable Child Mode but manifest as overcompensating or impulsive/undisciplined child modes (Rafaeli et al., 2011), which is beyond the scope of the present study.

Statistical approaches

We used Goldberg’s (2006) Bass-Ackwards method for estimating the hierarchical structure, which involved the estimation of a series of oblimin equamax-rotated principle component analysis (PCA) models with an increasing number of components.⁷ Subsequently, regression-based component scores were estimated for each solution and then correlated with one another to estimate the paths between levels of the hierarchy. Loadings with an absolute value of .40 and greater were used in the interpretation of these components.

In order to guide the selection of components, we used parallel analysis with random data eigenvalues based on 1000 correlation matrices, the *eigenvalue higher than 1*-criterion, scree plot analysis (the largest drops on the scree-plot), and a criterion of at least three primary loadings within each component.

Associations among study variables were investigated in terms of bivariate correlations and multiple regression. Due to the large number of correlation coefficients, we used a highly conservative alpha level of .0001, and because shared method variance may have possibly inflated the effect size magnitudes, we focused our interpretation on primary correlations with coefficients above .30.

The role of EMS in the association between specified parenting styles and the vulnerable child mode was examined by means of regression-based parallel mediation analyses, in which we considered different effects (Hayes, 2013). 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 parallel 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 we examined the direct and indirect effects of specified YPI-R parenting scores on the SMI Vulnerable Child Mode score through the four EMS domains, simultaneously. Based on recommendations by Hayes (Hayes, 2013) and Mackinnon et al. (MacKinnon, Fairchild, & Fritz, 2007), a bootstrapping sampling procedure was applied for assessing indirect effects. This procedure allows calculating the indirect effect of the individual mediator controlling for the other potential mediators. The reported unstandardized effect sizes for indirect effects were considered significant if zero was not included in the 95% bias-corrected confidence interval (10,000 bootstrapped samples).

As age and/or gender showed significant association with at least one of the schema domains, we decided to statistically control for their influence by including them as covariates in the regression and mediation models. All analyses were performed using SPSS 22 and PROCESS version 2.14 (Hayes, 2013).

Results

Hierarchical organization and selection of four schema domains

The first goal of this study was to explore the hierarchical organization of the 18 EMS in order to select the most appropriate number of schema-domains based on empirical indicators and interpretability. The hierarchical PCA structure for one-, two, three, four, and five component solutions are shown in Figure 1, including estimated path coefficients between the levels.

In the one-component model of general maladaptivity, each of the 18 EMS loaded above .40, with the exception of Entitlement (.35). In the two-component solution, the general component of maladaptivity was subdivided into two components characterized by Internalizing features (e.g. Defectiveness and Pessimism) and Externalizing features (e.g. Entitlement and Approval-Seeking), respectively. Moving down the hierarchy to the three-component solution, the Internalizing component splits into two components that resemble the domains of Impaired Autonomy and Performance (e.g. Dependence and Failure) and Excessive Responsibility & Standards (e.g. Unrelenting Standards & Self-Sacrifice), respectively. The Externalizing component is largely retained in terms of EMS that resemble the Impaired Limits domain. At the fourth level, the domain of Disconnection and Rejection emerges from elements of Impaired Autonomy & Performance and Excessive Responsibility and Standards. Finally, at the fifth level, the domain of Excessive Responsibility and Standards is split into Excessive Responsibility and Excessive Standards, respectively. The specific loadings used in this hierarchical analysis are provided in the supplemental Tables S3 and S4.

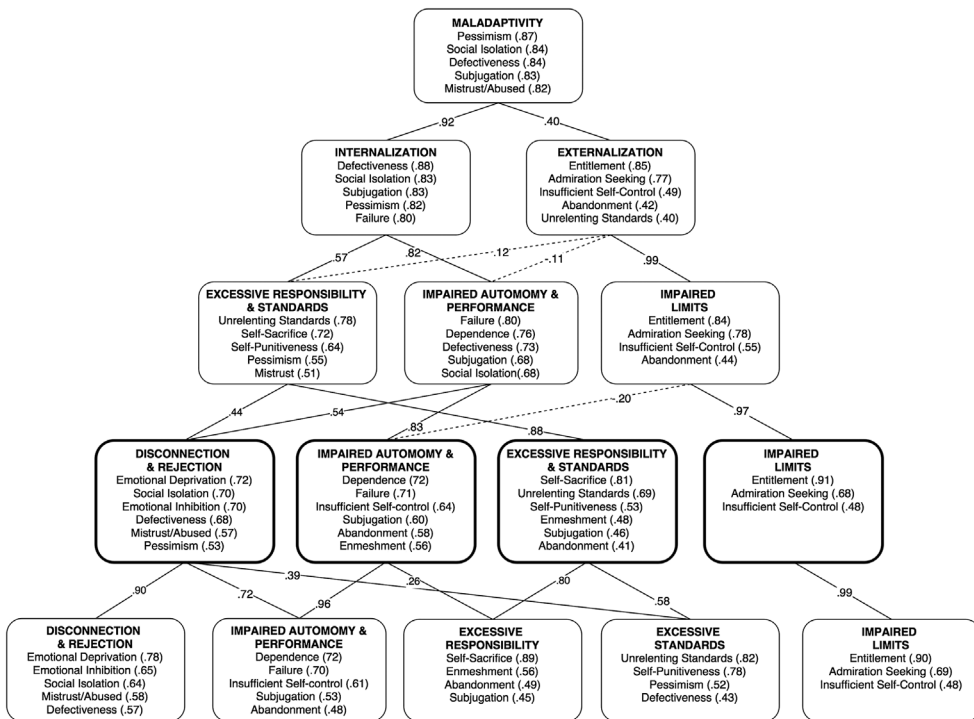


Figure 1. Hierarchical Organization of Early Maladaptive Schemas from 1 to 5 domains.

Note: $N = 1049$; Hierarchical structure of exploratory principle component analysis from 1 to 5 levels according to the back-wards approach (Goldberg, 2006). Level 1, 2, 3, and 5 report the five strongest loadings above .40, whereas level 4 reports the six strongest loadings above .40. Primary significant path coefficients between levels are reported.

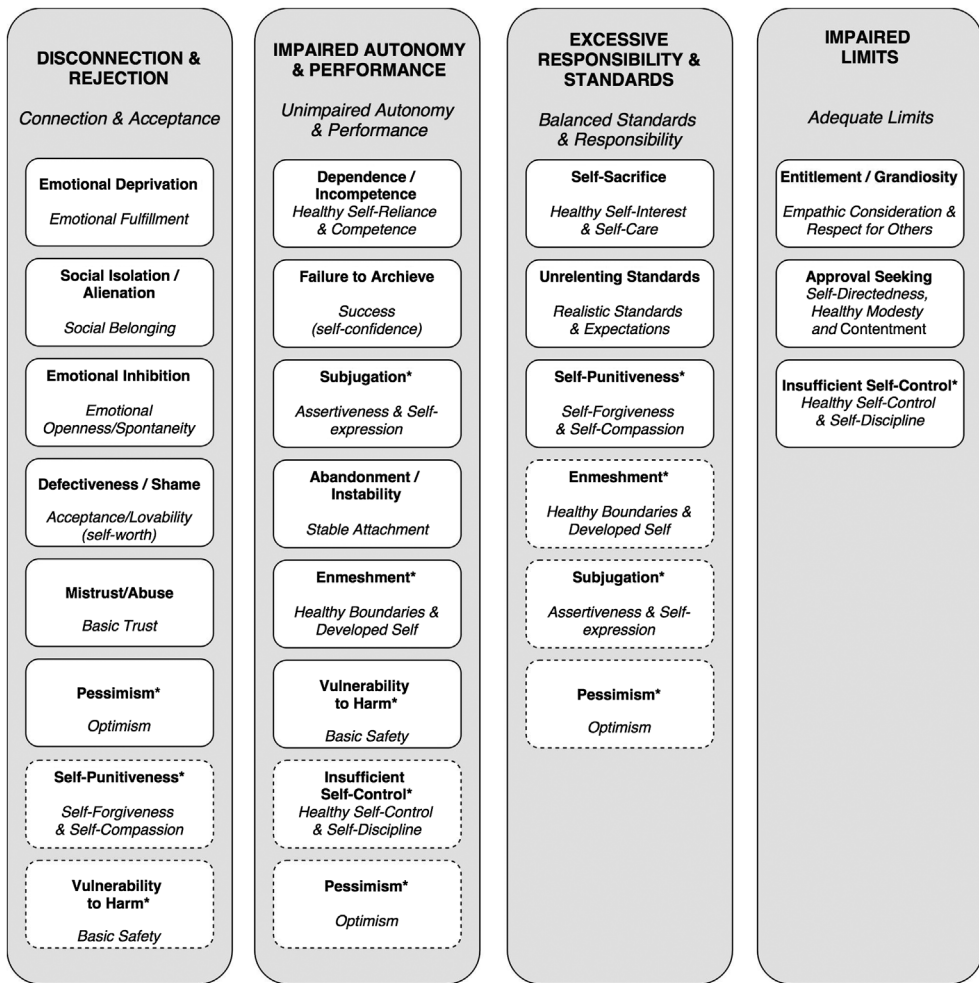


Figure 2. New Proposed Organization of Early Maladaptive Schemas in Four Domains.

Note: Schemas in dashed boxes represent potential secondary domain affiliations. The order of schemas within each domain reflects the empirical hierarchy of affiliation (cf. supplemental Tables S3 and S4). Definitions in italic represent proposed adaptive features of the specified domains and schemas, which are expected to develop when core emotional needs are being met (Lockwood & Perris, 2012).

Statistical indicators (parallel analysis and the *eigenvalue higher than 1*-criterion) indicated a two-component model to be most appropriate (see supplemental Table S5). In terms of primary PCA loadings, a five-component solution involved five conceptually meaningful components with at least three primary loadings within each component (see supplemental Table S4). Finally, a scree plot analysis indicated that a two or four component structure would be most appropriate (see supplemental Figure S1; the largest drops on the scree-plot occurred before the third and the fifth components, respectively). Nevertheless, statistical arguments alone are in principle insufficient in leading to final decisions about choice of model as conceptual arguments that incorporate the clinical experience of practitioners are crucial (Vassend & Skrondal, 1999).

Taking all the aforementioned indicators into account, we decided to choose the four-component solution consistent with the majority of previous findings and Young's most recent conceptualization (Kriston et al., 2012; Lockwood & Perris, 2012; Sakulsriprasert et al., 2016; Young, 2014). As depicted in Figure 3, 22% of the variance was explained by Component 1 (Disconnection and Rejection), 21% was explained by Component 2 (Impaired Autonomy and Performance), 16% was explained by Component 3 (Excessive Responsibility and Standards), and 13% was explained by Component 4 (Impaired Limits). All EMS showed substantial loadings ($>.50$) on relevant domains within this structure (except the schema of Vulnerability [.45]). Tucker's congruence coefficients between clinical and nonclinical subsamples indicated nearly identical structures for Disconnection & Rejection (.97), Impaired Autonomy and Performance (.96), and Excessive Responsibility & Standards (.98), whereas the similarity for Impaired Limits (.91) was satisfactory. Additionally, it has previously been established that YSQ factors are invariant across clinical and nonclinical samples (Rijkeboer, Bergh, & Van Den Bergh, 2006).

Based on the aforementioned PCA loading pattern along with contemporary ST theory and previous findings (Kriston et al., 2012; Lockwood & Perris, 2012; Young et al., 2003), a new proposed clustering of all 18 EMS is presented in Figure 2 (see discussion for further details). A scoring key for computing the four YSQ-S3 domain scores is provided in Table 2.

Association between EMS and recollected experiences of parenting

Specific bivariate associations between EMS and parenting styles are reported in Table 1. Accordingly, *emotionally depriving parenting* was primarily associated with schemas of emotional deprivation, social isolation, and defectiveness; *overprotective parenting* was primarily associated with the schema of enmeshment; *belittling parenting* was primarily associated with schemas of emotional deprivation, social isolation, defectiveness, pessimism, and mistrust/abuse; *perfectionist parenting* was primarily associated with the schema of unrelenting standards; *controlling parenting* was primarily associated with schemas of subjugation, enmeshment, emotional deprivation, social isolation, and pessimism; *emotionally inhibited parenting* was primarily associated with schemas of emotional deprivation, emotional inhibition, and social isolation; *punitive parenting* was primarily associated with schemas of emotional deprivation, social isolation, mistrust/abuse, defectiveness, and self-punitiveness; *conditional/narcissistic parenting* was primarily associated with the schema of approval/admiration seeking. Overall, the variance in schema domains explained by parenting ranged from .01% ($r = -.01$) to 23% ($r = .48$). Likewise, the variance in the vulnerable child mode explained by schema domains ranged from 4% ($r = .20$) to 40% ($r = .63$). For example, an *emotionally depriving mother* explained 30% ($r = .55$) of the variance in the schema of emotional deprivation, whereas the schema of defectiveness explained 64% ($r = .80$) of the variance in the vulnerable child mode.

PCA loadings of the 18 EMS on the four domains along with multiple regression coefficients from the domains to the dysfunctional parenting styles are displayed in Figure 3. As shown, each domain is portrayed by a constellation of parenting styles. Overall, these results indicate that EMS are associated with dysfunctional parenting in relation to the four domains. As expected, the domain of Disconnection & Rejection was substantially associated with emotionally depriving parenting but also belittling parenting; the domain of Impaired Autonomy and Performance was substantially associated with overprotective

Table 1. Bivariate associations among primary study variables.

| Variables | Emotionally depriving | | Over- protective | | Belittling | | Perfectionist | | Pessimistic/ fearful | | Controlling | | Emotionally inhibited | | Punitive | | Conditional/ narcissistic | | Vulnerable child ^a |
|---------------------------|--------------------------|-----|---------------------|-----|------------|-----|---------------|-----|-------------------------|-----|-------------|-----|--------------------------|-----|----------|-----|------------------------------|-----|----------------------------------|
| | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F | |
| Emotional deprivation | .55 | .40 | .04 | .12 | .50 | .44 | .16 | .16 | .31 | .24 | .39 | .36 | .43 | .31 | .39 | .32 | .32 | .25 | .70 |
| Abandonment | .28 | .26 | .21 | .20 | .32 | .34 | .20 | .23 | .29 | .23 | .35 | .31 | .19 | .20 | .26 | .27 | .23 | .26 | .69 |
| Mistrust/abuse | .34 | .34 | .14 | .14 | .37 | .43 | .22 | .20 | .27 | .28 | .36 | .34 | .25 | .28 | .33 | .31 | .29 | .27 | .71 |
| Social isolation | .41 | .36 | .12 | .15 | .42 | .45 | .20 | .23 | .30 | .26 | .36 | .36 | .31 | .28 | .34 | .30 | .27 | .28 | .84 |
| Defectiveness | .39 | .32 | .10 | .16 | .41 | .41 | .19 | .21 | .29 | .22 | .35 | .32 | .30 | .25 | .32 | .26 | .25 | .24 | .80 |
| Failure | .30 | .26 | .13 | .17 | .31 | .34 | .09 | .15 | .22 | .15 | .28 | .26 | .19 | .18 | .25 | .23 | .18 | .16 | .67 |
| Dependence | .27 | .25 | .23 | .21 | .31 | .34 | .10 | .13 | .24 | .19 | .32 | .23 | .20 | .16 | .27 | .24 | .20 | .18 | .68 |
| Vulnerability | .26 | .29 | .15 | .17 | .31 | .36 | .16 | .18 | .27 | .21 | .31 | .33 | .19 | .20 | .26 | .26 | .24 | .23 | .66 |
| Enmeshment | .12 | .14 | .32 | .28 | .21 | .22 | .28 | .18 | .27 | .18 | .49 | .28 | .08 | .09 | .22 | .18 | .28 | .20 | .54 |
| Subjugation | .36 | .28 | .18 | .17 | .37 | .36 | .19 | .23 | .29 | .21 | .44 | .34 | .29 | .21 | .29 | .25 | .25 | .24 | .71 |
| Self-sacrifice | .23 | .10 | .04 | .14 | .26 | .19 | .19 | .12 | .21 | .14 | .23 | .22 | .15 | .05 | .25 | .18 | .21 | .14 | .38 |
| Emotional inhibition | .38 | .29 | .12 | .14 | .35 | .34 | .20 | .18 | .23 | .24 | .32 | .27 | .35 | .27 | .30 | .24 | .24 | .20 | .66 |
| Unrelenting standards | .28 | .23 | .05 | .10 | .29 | .26 | .33 | .26 | .26 | .19 | .31 | .24 | .22 | .19 | .24 | .20 | .29 | .25 | .46 |
| Entitlement | .01 | .10 | .18 | .12 | .03 | .14 | .10 | .12 | .07 | .14 | .13 | .17 | .05 | .09 | .06 | .11 | .13 | .19 | .20 |
| Insufficient self-control | .26 | .26 | .24 | .20 | .29 | .33 | .14 | .13 | .26 | .20 | .29 | .26 | .20 | .18 | .27 | .25 | .20 | .19 | .65 |
| Approval seeking | .07 | .10 | .20 | .17 | .11 | .16 | .21 | .21 | .21 | .19 | .22 | .20 | .05 | .05 | .12 | .14 | .24 | .31 | .35 |
| Pessimism | .34 | .33 | .16 | .19 | .36 | .40 | .20 | .21 | .30 | .23 | .35 | .35 | .26 | .24 | .30 | .27 | .26 | .25 | .75 |
| Self-punitiveness | .34 | .28 | .09 | .17 | .37 | .38 | .23 | .21 | .27 | .23 | .35 | .30 | .25 | .19 | .32 | .26 | .27 | .25 | .61 |
| DISC | .48 | .39 | -.05 | .02 | .42 | .41 | .09 | .12 | .19 | .20 | .23 | .27 | .40 | .33 | .31 | .25 | .19 | .15 | .63 |
| IMAU | .10 | .12 | .25 | .20 | .16 | .20 | .02 | .07 | .18 | .08 | .25 | .16 | .04 | .05 | .14 | .14 | .09 | .09 | .52 |
| EXCE | .18 | .08 | .03 | .12 | .22 | .14 | .30 | .20 | .22 | .14 | .29 | .20 | .11 | .04 | .21 | .14 | .24 | .18 | .29 |
| IMLI | -.01 | .10 | .21 | .13 | .02 | .12 | .14 | .14 | .10 | .16 | .13 | .16 | .02 | .08 | .05 | .11 | .16 | .23 | .20 |
| Vulnerable child | .42 | .37 | .14 | .18 | .43 | .44 | .23 | .21 | .35 | .24 | .39 | .36 | .34 | .27 | .36 | .30 | .29 | .27 | - |

Notes: Correlations from .08 are significant at the .001 level, and correlations from .12 are significant at the .0001 level. M = Mother parental figure; F = Father parental figure; DISC = Disconnection & Rejection; IMAU = Impaired Autonomy & Performance; EXCE = Excessive Responsibility & Standards; IMLI = Impaired Limits. $n = 850$; ^a $n = 1049$.

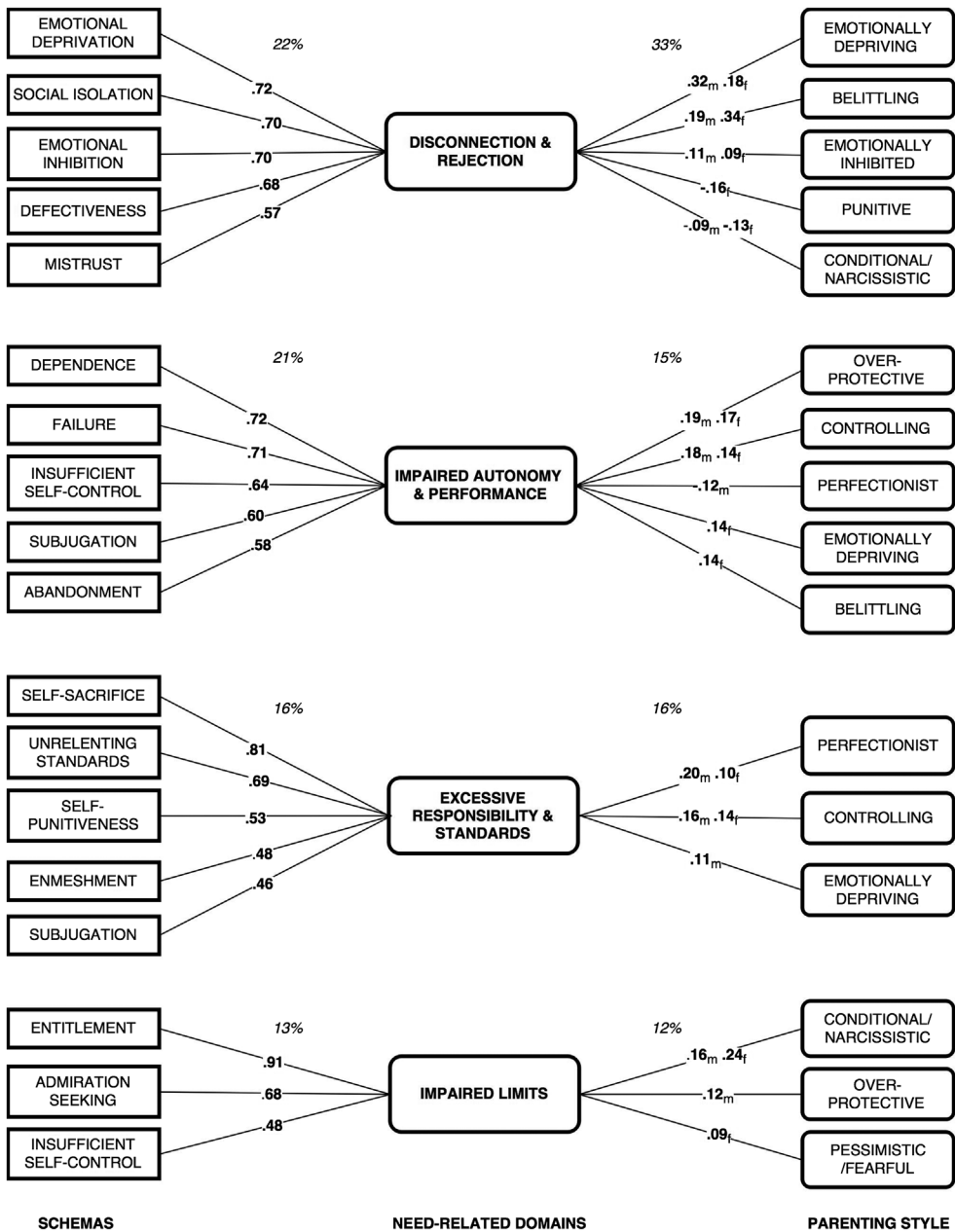


Figure 3. Association between Early Maladaptive Schemas and Dysfunctional Parenting within Four Need-related Domains.

Note: $N = 850$. The figure depicts the four schema domains in relation to *specific schemas* (YSQ-53 principle component coefficients on the left) and *parenting styles* (standardized YPI-R regression coefficients adjusted for age and gender on the right). The percentages on the left indicate how much variance each component explains. The percentages on the right indicate how much of the variance in each domain (R^2) that is explained by the parenting styles. Coefficients are only given for primary loadings above .40 and significant regression coefficients ($p < 0.05$). ^mMother or significant female authority figure; ^fFather or significant male authority figure.

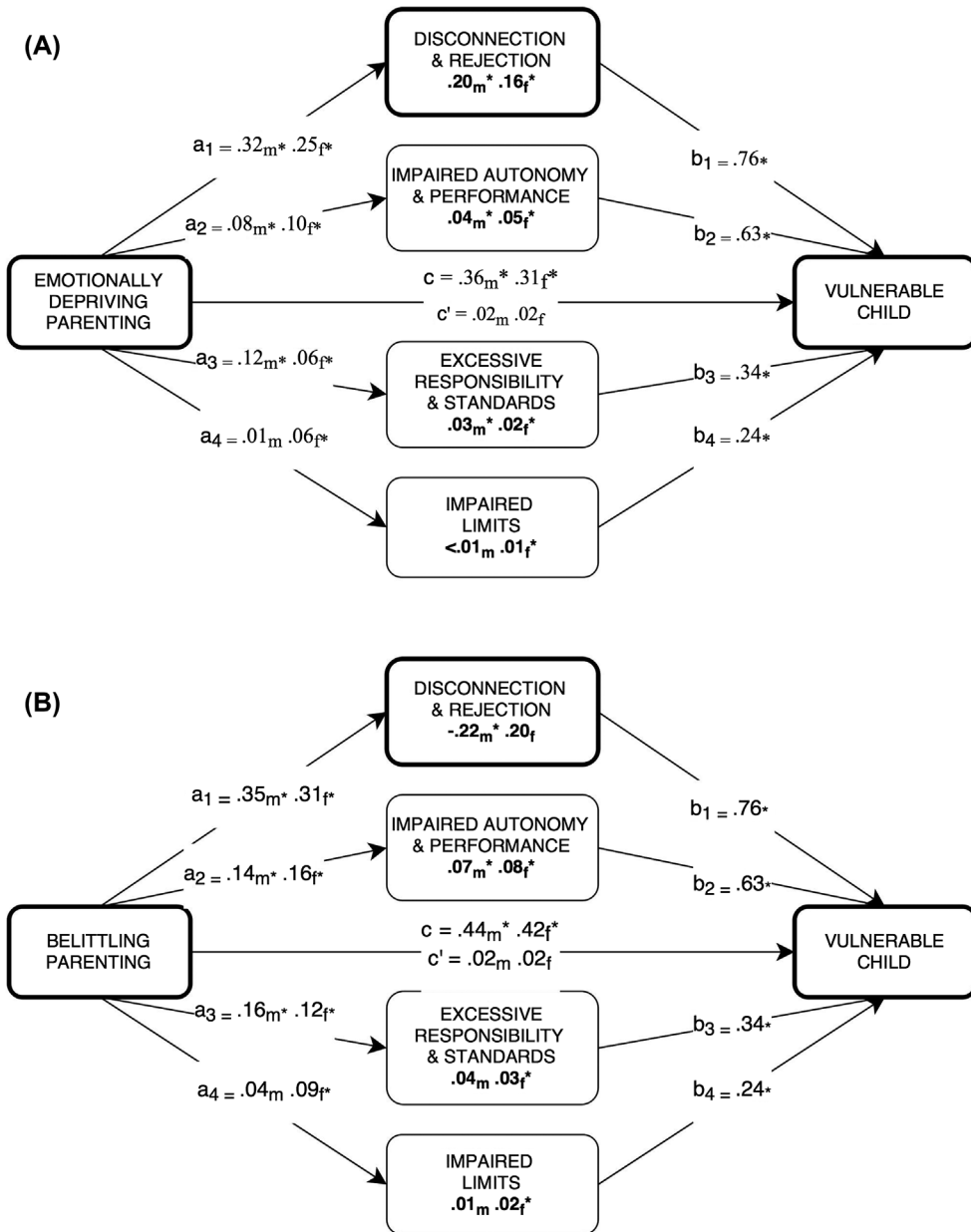


Figure 4. Two Major Routes to Vulnerable Child Mode through Disconnection & Rejection.

Note: $N = 850$. Model A: Emotionally depriving parenting explained 22% of the variance in Vulnerable Child Mode. Model B: Belittling parenting explained 26% of the variance in Vulnerable Child Mode. Bolded values are indirect/mediating effects (standardized). All coefficients marked with an asterisk (*) are significant in terms of 95% bias-corrected confidence intervals that do not contain zero (10,000 bootstrapped samples). c = total effect, c' = direct effect (when a and b are accounted for). In this mediation model, all mediator variables (i.e., schema domains) were analyzed simultaneously while controlling for the effect of the other schema domains. Estimations were statistically adjusted for age and gender. Unstandardized mediation effects and specified confidence intervals are available upon request.

Table 2. Scoring key for computing schema domains scores using YSQ-S3.

| Schema domains | YSQ-S3 scales | Average score |
|--------------------------------------|--|---------------|
| Disconnection & Rejection | Emotional Deprivation, Social Isolation, Emotional Inhibition, Defectiveness, Mistrust/Abused, Pessimism | |
| Impaired autonomy & Performance | Dependence, Failure, Subjugation, Abandonment, Enmeshment, Vulnerability to Harm | |
| Excessive Responsibility & Standards | Self-Sacrifice, Unrelenting Standards, Self-Punitiveness | |
| Impaired Limits | Entitlement, Approval/Admiration-Seeking, Insufficient Self-Control | |

Notes: Step 1. Compute the 18 YSQ-S3 schema scores according to the official scoring key (Young, 2005).

Step 2. Compute the 4 schema domain scores using the scoring table.

Exclusion of the most cross-loading schema within each domain may improve discriminant validity: Pessimism (*Disconnection & Rejection*), Vulnerability to Harm (*Impaired Autonomy & Performance*), Self-Punitiveness (*Excessive Responsibility & Standards*), and Insufficient Self-control (*Impaired Limits*).

and controlling parenting; the domain of Excessive Responsibility and Standards was substantially associated with perfectionistic parenting; and the domain of Impaired Limits was substantially associated with conditional/narcissistic parenting.

The role of EMS in the association between parenting and vulnerable child

Results of mediation analyses are depicted in Figures 4 and 5. In all four mediation analyses the total association between parenting styles and vulnerable child mode was substantially accounted for by the effect of EMS (the direct effects [c'] were considerably reduced and did not remain significant), except for the association between mother's perfectionistic parenting and the vulnerable child mode.

As hypothesized, the domain of Disconnection and Rejection primarily mediated the association between emotionally depriving parenting and the vulnerable child mode (Figure 4(a)). Likewise, Disconnection and Rejection primarily mediated the association between belittling parenting and the vulnerable child mode (Figure 4(b)). As hypothesized we also found the domain of Impaired Autonomy & Performance to predominantly mediate the association between overprotective parenting and the vulnerable child mode (Figure 5(a)). Finally, as hypothesized the domain of Excessive Responsibility and Standards (along with the domain of Disconnection and Rejection) predominantly mediated the association between perfectionistic parenting and the vulnerable child mode (Figure 5(b)). However, in all four mediation models, the domain of Disconnection & Rejection played a major role supporting its theorized core function in various emotional and personality-related problems (Young et al., 2003).

Consistent with ST theory and the bivariate associations in Table 1, we did not anticipate the domain of Impaired Limits to mediate the association between parenting and the vulnerable child mode, as the EMS of entitlement, approval/admiration-seeking, and insufficient self-control schema (which are predominant for this domain) usually manifest as overcompensating or impulsive/undisciplined child modes (Rafaeli et al., 2011), which were not included in the present study.

Finally, a *post hoc* subsample analysis ($n = 524$) established that the four schema domains and the vulnerable child mode were substantially related to SCL-90-R symptom severity

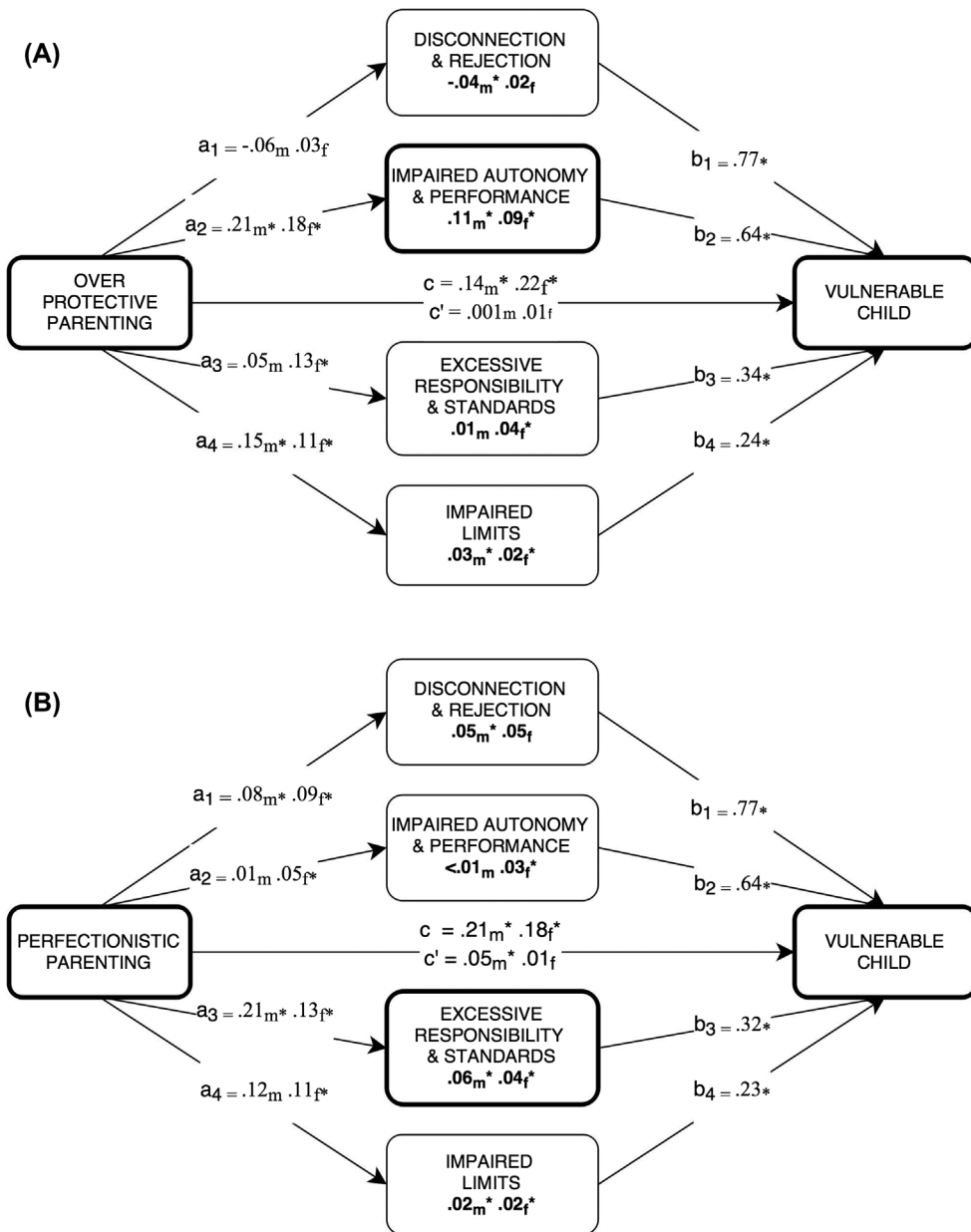


Figure 5. Two Major Routes to Vulnerable Child Mode through (A) Impaired Autonomy & Performance and (B) Excessive Responsibility & Standards.

Note: $N = 850$. Model A: Overprotective parenting explained 4% of the variance in Vulnerable Child Mode. Model B: Perfectionistic parenting explained 7% of the variance in Vulnerable Child Mode. Bolded values are indirect/mediating effects (standardized). All coefficients marked with an asterisk (*) are significant in terms of 95% bias-corrected confidence intervals that do not contain zero (10,000 bootstrapped samples). c = total effect, c' = direct effect (when a and b are accounted for). In this mediation model, all mediator variables (i.e., schema domains) were analyzed simultaneously while controlling for the effect of the other schema domains. Estimations were statistically adjusted for age and gender. Unstandardized mediation effects and specified confidence intervals are available upon request.

distress (mostly for “Disconnection & Rejection” and least for “Impaired Limits”). Moreover, the vulnerable child mode substantially accounted for the associations between schemas and symptom distress (see supplemental Figure S2).

Discussion

In the current study we set out to examine the empirical organization of EMS, and their theorized role within the ST model of personality pathology (i.e. schema domains in relation to retrospectively reported parenting styles and current frequency of vulnerable child mode). First we explored the hierarchical structure of the 18 EMS and established that a four component model was most empirically sound and theoretically meaningful. In regards to the three newest/unclustered EMS, we decided that “Approval/Admiration-Seeking” was best clustered with Impaired Limits, “Self-Punitiveness” was best clustered with Excessive Responsibility and Standards, whereas “Pessimism” primarily loaded on Disconnection & Rejection while also showing substantial loadings on Impaired Autonomy & Performance and Excessive Responsibility & Standards consistent with its general features of demoralization. Subsequently, we investigated associations between recollected need-thwarting parenting and current EMS, and found that the four schema domains were largely predicted by conceptually coherent need-thwarting parental styles. Finally, we tested four hypothesized mediational models in which designated EMS domains mediate the links between specified parenting styles and the vulnerable child mode. Overall we found the mediational paths to be consistent with ST theory; notably, the proposed core domain of Disconnection and Rejection played a substantial role in all mediational models. Aspects of these findings are further discussed in the following. Table 2 provides a new YSQ-S3 scoring key for computing the four empirically and conceptually supported domain scores.

Potential role of EMS between parenting and adult vulnerability

As shown in Figure 3, most parenting styles were associated with more than one schema domain. The findings support that *Emotionally depriving parenting* (Figure 4(a)) may have resulted in the child not feeling emotionally attached and loved (i.e. abandonment and emotional deprivation) related to patterns of “Disconnection & Rejection”, which is associated with frequent experiences of being in a vulnerable child mode (e.g. lonely/abandoned child) including distressing hunger for warmth or fear of being abandoned. *Belittling parenting* (Figure 4(b)) may have resulted in the child not feeling accepted and valued (i.e. defective) related to enduring patterns of “Disconnection & Rejection”, which is associated with frequent experiences of being in a vulnerable child mode (e.g. wounded/abuse child) including distressing hunger for feeling accepted, loved, and validated. *Overprotective parenting* (Figure 5(a)) may have resulted in the child lacking self-confidence, autonomy and self-reliance (e.g. dependence/lack of competence) related to enduring patterns of “Impaired Autonomy & Performance”, which is associated with frequent experiences of being in a vulnerable child mode (e.g. dependent child). *Perfectionistic parenting* (Figure 5(b)) may have resulted in the child feeling too much responsibility and too high demands from authority figures (e.g. unrelenting standards and self-sacrifice) related to patterns of “Excessive Responsibility & Standards”, which is associated with frequent experiences of

feeling like a vulnerable child under pressure trying hard to live up to one's own or other's standards (e.g. internalized demanding parent mode).

Issues related to the impaired limits domain

In the present study, the schema domain of “Impaired Limits” (including features of narcissism and approval/admiration-seeking) was partially supported in terms of association with theoretically related parenting styles. In the literature, two routes to narcissism have been proposed: first, narcissistic individuals develop a grandiose self-image as a means of overcompensating for underlying feelings of inferiority, loneliness, and under-gratification (Ronningstam, 2010). Accordingly, these individuals often report being raised by parents who ignored their basic emotional needs, while using the child to satisfy their own egoistic needs such as performance, prestige, and specialness (Ronningstam, 2010). This is largely consistent with the conditional/narcissistic parenting style, and is also consistent with the co-existing schema of approval/admiration seeking. Secondly, narcissistic individuals develop a sense of entitlement by being spoiled or over-gratified by their parents (Fernando, 1998). In other words, the parents implicitly or explicitly give them the message that they are entitled to get what they want when they want it. This may also explain the co-existing schema of insufficient self-control. However, in the current study, features of “spoiling parenting” were not explicitly measured. Nevertheless, this may be somewhat covered by features of overprotective parenting (e.g. “did too many things for me instead of letting me do things on my own”).

Consistent with previous studies (Lockwood & Perris, 2012), we found that the insufficient self-control schema loaded on both “Impaired Autonomy & Performance” and “Impaired Limits” revealing its conceptual duality. In an overprotective environment involving impaired autonomy, a child may not develop healthy self-discipline and “backbone”. Likewise, in a spoiling or over-gratifying environment, a child may not develop healthy self-control and modesty.

Classifying the three unclassified EMS

In regards to classifying the three most recently added EMS, we came up with the following conclusions: The *pessimism schema* showed substantial loadings on all domains (except “Impaired Limits”) indicating its features of demoralization or general distress; however, based on its primary loading in the current and previous studies we decided to cluster it within the core domain of “Disconnection & Rejection”. The *approval/admiration seeking schema* primarily loaded on “Impaired Autonomy” along with entitlement, which is consistent with the empirically and theoretically established linkage between attention seeking and grandiosity (Wright et al., 2013). The *self-punitiveness schema* had a slightly stronger loading on “Excessive Responsibility & Standards” in comparison to “Disconnection & Rejection” suggesting that this schema is particularly linked to features of harsh perfectionism, guilt and self-criticism (e.g. if I make a mistake, I deserve to be punished).

Strengths, limitations, and future directions

The major strength of the present study is the inclusion of a large mixed sample with appropriate heterogeneity of individuals covering a range of schema/mode severity, personality problems, and experiences of dysfunctional parenting. Furthermore, this study was the first to evaluate and delineate a preliminary higher order model of all 18 EMS while also testing a theorized relationship with need-thwarting parenting and the vulnerable child mode. This is both a significant and novel addition to the contemporary ST literature, and useful for future operationalization in research and clinical settings. However, certain limitations and recommendations for future research should be emphasized.

First, we used concurrently self-reported constructs (as opposed to interview ratings or other independent data) potentially involving a risk for artificially high correlations among measures due to mono-method bias (Campbell & Fiske, 1959).

Second, we tested the proposed mediation models using cross-sectional data and a single measurement method, which is an approach that has been questioned (Maxwell & Cole, 2007). However, we used mediation analyses in accordance with recommendations by Hayes (Hayes, 2013) and MacKinnon (MacKinnon et al., 2007) as an initial attempt to test a proposed model. Thus, the findings provided preliminary support for the model, but longitudinal research is necessary for a conclusive test of mediation. The preliminary findings underscore the unique roles of three schema domains as potential mediators between specific need-thwarting parenting and the vulnerable child mode. Accordingly, the proposed mediational models may be a reasonable basis for more comprehensive investigations in future studies. A more definitive test of our mediational model would require that parenting be assessed during childhood and early adolescence, that EMS be assessed during mid-adolescence, and that the vulnerable child mode be assessed during adulthood.

Third, the retrospectively recollected reporting may have been influenced by state-dependent memory and recall bias reflecting current EMS or the vulnerable child mode. However, comparative research has found no significant difference between prospective records and retrospective self-reports of childhood maltreatment (Scott, McLaughlin, Smith, & Ellis, 2012).

Fourth, as previous studies suggest that personality pathology is in part heritated (Torgersen, 2009), it is possible that the link between experiences of parenting and the vulnerable child mode in adulthood partly reflects the interaction between genetic factors and the experience of parenting, schema development, and occurrence of the vulnerable child mode in adulthood. For example, an inborn sensitive temperament may predispose a child to perceive more stress and negative parenting and, in turn, may elicit more negative parenting (van Os, Park, & Jones, 2001). That is, need-thwarting parenting as well as negative life events may not occur randomly, as it is both perceived, encountered, and precipitated more frequently by individuals with a vulnerable biological temperament. There is also evidence suggesting that a child with a more sensitive temperament is especially responsive to exceptionally positive parenting styles and has the capacity to develop, among other things, an unusually secure attachment (Lockwood & Perris, 2012); a pattern which defines the polar opposite of the Disconnection and Rejection domain and one that is currently being empirically investigated by Louis, Lockwood and Wood (unpublished manuscript). This latter capacity is one that ST is especially well suited to capitalize on with its promotion of

a high degree of responsiveness towards the needs associated with this domain (Lockwood & Perris, 2012).

Finally, in response to the aforementioned limitations, future research should include a prospective design and further examine the role of EMS in relation to compliant surrenderer coping mode as well as overcompensatory coping modes (e.g. self-aggrandizor and bully & attack). The latter may involve specific inclusion of clinical populations with externalizing disorders (e.g. antisocial and narcissistic features). Overall, in future evaluation and development of the ST model, it is important not just to rely on statistical arguments but also to incorporate theoretical arguments based on practitioners' experiences (Vassend & Skrondal, 1999).

Notes

1. *Limited reparenting* is considered the heart of treatment in schema therapy aimed at meeting patients' needs by helping the patient find the experiences that were missed in early childhood that will serve as an antidote to the damaging experiences that led to maladaptive schemas and modes. Limited reparenting parallels healthy parenting by supporting the patient's ability to meet own needs, and involves the establishment of a secure attachment through the therapist within the bounds of a professional relationship (Lockwood & Perris, 2012).
2. Supplemental Table S1 indicates which parental styles that are expected to be related to the potential frustration of these needs.
3. (1) Disconnection & Rejection, (2) Impaired Autonomy and Performance, (3) Other-Directedness, (4) Overvigilance and Rejection, and (5) Impaired Limits.
4. The YPI-R is derived from the original 2×72 -items YPI (Young, 2003); see details in Sheffield et al. (2006).
5. Different versions of the SMI exist. In the current study we used the shortened 118-items version developed and validated by Lobbestael et al. (2010).
6. The schemas of "unrelenting standards" and "self-punitiveness" are anticipated features of this domain, which are not explicitly related to the vulnerable child mode but rather related to an internalized demanding/punitive parent mode, which is implicitly manifested as distress in the vulnerable child mode (Young et al., 2003).
7. We chose an exploratory approach over confirmatory factor analysis (CFA) because exploratory analysis is considered most reasonable for personality-like data (Hopwood & Donnellan, 2010). PCA was chosen because most previous YSQ research, including the initial construction studies used this approach (e.g. Lee, Taylor, & Dunn, 1999; Schmidt, Joiner, Young, & Telch, 1995). Loadings were rotated with oblimin Equamax and Kaiser Normalization in order to simplify both variable and component complexity, while spreading variances across the components and combining features of both the Quartimax and Varimax criteria. The oblique version of Equamax was used because the YSQ-S3 scales are substantially intercorrelated.

Disclosure statement

No potential conflict of interest was reported by the authors.

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