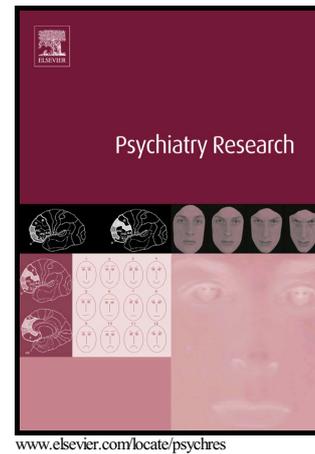


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The role of childhood trauma, early maladaptive schemas, emotional schemas and experimental avoidance on depression: A structural equation modeling

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Abstract

The present investigation was designed to examine disconnection and rejection (DR) schemas, negative emotional schemas (NESs) and experimental avoidance (EA) as mediating variables of the relationship between the childhood trauma (CT) and depression. Specifically we examined the mediating role of NESs and EA between DR schemas and depression. The study sample consist of 439 female college students ($M_{\text{age}} = 22.47$; $SD = 6.0$), of whom 88 met the criteria for current major depressive disorder (MDD) and 351 who had history of MDD in the last 12 months. Subjects were assessed by Structured Clinical Interview for DSM-IV (SCID) and completed the Childhood Trauma Questionnaire (CTQ), the Early Maladaptive Schemas Questionnaire (SQ-SF), the Leahy Emotional Schemas Scale (LESS), the Acceptance and Action Questionnaire (AAQ-II), and the Beck Depression Inventory-II (BDI-II). The findings showed that DR schemas were mediator of the relationship CT and depression but CT through the NESs and EA did not predict depression. NESs were mediator of the relationship between DR schemas and depression and EA was mediator of the relationship between DR schemas and depression. In

general, results suggest that intervention of depressed women may need to target the changing of DR schemas, NESs and reduction of EA.

Keywords: Childhood Trauma, Early Maladaptive Schemas, Emotional Schemas, Experimental avoidance, Depression

1. Introduction

Cognitive model (Beck, 1983) of depression shows that negative cognitive styles work as key vulnerability factors for depression, especially when interacting with early adverse relational experiences. Cognitive therapy model (Beck, 1983) and schema theory (Young et al., 2003) are two of the most important models to explain the development and sustenance of psychopathology including depression. According to cognitive therapy, the key vulnerability factor to depression are negative core beliefs, or “schemas” about the world, the self, and the future (Beck, 1983).

Young et al. (2003) identified a variety of early maladaptive schemas that are hypothesized to underlie several psychological disorder, including depression by integrating the Beck’s cognitive model (1983) and others (e.g., Bowlby, 1980). According to schema therapy (Young et al., 2003), abused children are at risk for developing early maladaptive schemas. More specifically, early maladaptive schemas arise when psychological needs (e.g., freedom to express valid needs and emotions, autonomy, secure attachment) are not met. Therefore, early maladaptive schemas act as pattern for information processing which affect an individual’s emotional response to life events (Dozois et al., 2009).

In cross-sectional studies, early trauma (abuse and neglect) have been found to be predictors of adulthood depressive disorder (Schulz et al., 2014; Suzukia et al., 2014; Agorastos et al.,

2014; Pompili et al., 2014). For example Comijs et al. (2013) revealed that individuals who experienced early trauma have greater tendency to be diagnosed with major depressive disorder. Demirci et al. (2016) established positive correlations between the type D personality and depression, emotional neglect, physical neglect, and emotional abuse in university students. In fact, some studies revealed that childhood trauma can predict depression directly (Kaunou et al., 2013; Michopoulos et al., 2015; Miron and Orcutt, 2014) and indirectly, through early maladaptive schemas (EMSs; Calvete et al., 2013), emotional schemas (ESs; Leahy, 2015), and experimental avoidance (EA; Bell and Higgins, 2015). However, none of the mentioned studies considered these variables consistently in a structural equation model. The first objective of this study was to test early maladaptive schemas, negative emotional schemas and experimental avoidance as mediators of childhood trauma on depressive symptoms. Therefore, in the present study we hypothesized that childhood trauma would contribute to the depressive symptoms through early maladaptive schemas, emotional schemas and experimental avoidance. Though, as direct support for this hypothesis, Westpha et al. (2016) found that invalidation, which is a specific type of emotional schemas, mediated the link between the parental abuse and depression symptoms in a sample of psychiatric outpatients. Akbaba et al. (2015) studied the relationship between childhood trauma and dysfunctional attitudes in women with depression. They found that childhood trauma scores were significantly associated with depression. Wright et al. (2009) revealed that emotional abuse and emotional neglect are connected with later symptoms of depression and mediated by schemas of defectiveness/shame. In another study, avoidance mediated the association between psychological maltreatment and depression in college students (Reddy et al., 2006). Lately, O'Mahen et al. (2015) found that rumination, which is a specific type of negative emotional schemas (Leahy, 2002), mediated between emotional abuse and

depression in a sample of major depressive disorder and women who had high levels of depressive symptoms but did not meet diagnostic criteria for major depressive disorder.

Furthermore, numerous researches have shown the impact of early maladaptive schemas on mood disorders (Hawke and Provencher, 2012) especially on depression (Halvorsen et al., 2010; Orue and Hankin, 2013; Renner et al., 2012). Researchers propose that disconnection/rejection (DR) domain is a robust predictor depression among all domains of early maladaptive schemas (Eberhart et al., 2011; Calvete, 2014; Calvete et al., 2005; Renner et al., 2012; Roelofs et al., 2011). Hence, disconnection/rejection domain is the focus of the present study.

According to the schema therapy model, the early maladaptive schemas develop behavioral (e.g., avoidance) and emotional (e.g., emotional schemas) maladaptive coping styles (Young et al., 2003). Consequently, early maladaptive schemas could be the mechanism via the negative emotional schemas and experimental avoidance increase symptoms of depression. The second objective was to test emotional schemas and experimental avoidance as mediators of the impact of disconnection and rejection schemas on depressive symptoms. In this study we hypothesized that early maladaptive schemas would guide information processing resulting in negative emotional schemas (NESs) and experimental avoidance, which in turn would contribute to the increase of depressive symptoms. This hypothesis has not been previously evaluated. Nevertheless, as indirect supports for this hypothesis, Calvete (2014) and Orue et al. (2014) established that rumination, which is a specific type of emotional schemas, mediated the link between the early maladaptive schemas and depression symptoms in a sample of school students.

Emotional schemas “refer to plans, concepts, and strategies employed in ‘response to’ an emotion” (Leahy, 2002, p. 179). Leahy (2002, 2007a, 2007b) assumed that different types of

emotional schemas develop and maintain depression through the depressogenic appraisal of emotions and the application of maladaptive coping strategies such as avoidance. Therefore, negative attributions and interpretations with regards to emotions (emotional schemas) would probably result in avoidance strategy (Leahy et al., 2011). Previous studies indicate that the emotional schemas has powerful predictive associations with the development of psychological disorders such as obsessive-compulsive disorder (OCD), resistant treatment anxiety (Leahy, 2007a), generalized anxiety (GAD; Sardarzadeh et al., 2014) and depression (Batmaz et al., 2014; Khanzade et al., 2013; Leahy, 2002; Leahy et al., 2012; Silberstein et al., 2012; Yavuz et al., 2011). The third objective was to test experimental avoidance as a mediator of the impact of negative emotional schemas on depressive symptoms. In the current study, we hypothesized that negative emotional schemas would contribute to the depressive symptoms through experimental avoidance. This hypothesis has not been previously assessed but Leahy believes that negative emotional schemas increase depressive symptoms through experimental avoidance (Leahy, 2002, 2015; Leahy et al., 2011) and Silberstein et al., (2012) found that negative emotional schemas is positively related with experimental avoidance.

Experiential avoidance signifies an unwillingness to remain in contact with unwanted inner experiences (i.e., negative emotions, thoughts, memories; Hayes et al., 1999). Experimental avoidance has been suggested to trigger several undesirable outcomes such as depression (Biglan et al., 2015; Brockmeyer et al., 2015; McCracken et al., 2015; Ottenbreit et al., 2014).

The principal objective of the present study is the determination of the fitness of the proposed model (Figure 1). The present study examined the predictive associations among childhood trauma, early maladaptive schema (disconnection and rejection schemas), negative emotional schemas, experimental avoidance and depressive symptoms in female college students with

current major depressive disorder and with history of major depressive disorder. In summary, the following hypotheses are proposed:

Hypothesis 1: Childhood trauma (CT) would contribute to the depressive symptoms through disconnection and rejection (DR) schemas, negative emotional schemas (NESs) and experimental avoidance (EA).

Hypothesis 2: Disconnection and rejection (DR) schemas would contribute to the depressive symptoms through negative emotional schemas (NESs) and experimental avoidance (EA).

Hypothesis 3: Negative emotional schemas (NESs) would contribute to the depressive symptoms through experimental avoidance (EA).

2. Method

2.1. Participants and Procedures

The present investigation is a descriptive-cross-sectional study. The population of this study was 21000 female college students in six different branches of Payam-e-Noor University with Persian language (Baharestan, Eslamshahr, Parand, Tehran Souht, Robotkarim and Varamin). Data were obtained from college women enrolled in a clinical research study of mood disorders and behavior in 2014 to 2016 academic year ($N=879$). Female students were eligible for participation if they were at least 19 years old, met diagnostic criteria for a current episode of a non-bipolar depressive disorder or had history of MDD in the last 12 months according to structured clinical interview for DSM-IV Axis I (SCID-I). Exclusion criteria were: diagnosis of borderline personality disorder (BPD), dependent personality disorder (DPD) according to SCID-II, diagnosis and history of bipolar disorders, diagnosis of dysthymia and suffering from physical disease.

After early diagnostic assessment that was carried out by senior psychiatrists, with successive monitoring and assessment by a research nurse under psychiatric supervision, 500 Participants met the inclusion criteria (current MDD=108, Participants with history of MDD in the last 12 months = 392). Then 500 questionnaires were distributed among the participations; out of which 439 of the questionnaires (current MDD=88, with history of MDD=351) were completed and returned. Age ranged from 19 to 43 years ($M = 22.47$, $SD = 6.0$). Secondary lifetime diagnoses comprised anxiety disorders ($N = 101$), dysthymic disorder ($N = 18$), depressive disorder NOS ($N = 21$), adjusted disorder ($N = 32$), obsessive compulsive disorder ($N = 38$), somatoform disorder ($N = 24$), and avoidant PD ($N = 39$)

2.2. Measures

2.2.1. Assessment of depressive symptoms

Structured Clinical Interview for DSM-IV Axis I & II (SCID): SCID is a structured diagnostic measure that is designed to assess DSM-IV Axis I and II disorders. In previous studies, the SCID has demonstrated good reliability (e.g., Williams et al., 1992). Inter-rater reliability coefficients ranged from 0.48 to 0.98 for categorical diagnosis, and from 0.90 to 0.98 for dimensional assessments (Intra-class correlation coefficient). Internal consistency coefficients have been reported satisfactory (0.71 to 0.94; Maffei et al., 1997). The number of criteria must be coded as present and clinically significant in order to obtain an Axis I and II diagnosis threshold. The Persian version of SCID which was employed in this study has satisfactory psychometric properties (Mohammadkhani, 2010).

Beck Depression Inventory (BDI-II; Beck et al., 2000): The BDI-II was used to assess depressive symptoms during the last two weeks. It evaluates the severity of depression and

consists of 21 items. The range of scores for each item is from 0 to 3, consequently, each individual can obtain 0 to 63 scores (higher scores present more depressive symptoms). The reliability and validity of the BDI-II have been well established in both clinical and non-clinical samples (Beck et al., 2000). In general, the Persian version of the BDI-II can be considered reliable and valid. Cronbach's alpha coefficient has been found to be 0.93 for the BDI-II (Dabson and Mohammadkhani, 2007). In the present study, the obtained Cronbach's alpha was 0.88.

Measures of childhood trauma, early maladaptive schemas, emotional schemas and experimental avoidance

The 28-item CT Questionnaire (CTQ; Bernstein et al., 2003): The CTQ retrospectively assesses the severity of different types of trauma and offers five subscales: Sexual abuse (SA), emotional abuse (EA), physical abuse (PA), physical neglect (PN), and emotional neglect (EN). “Sexual abuse refers to sexual contact or conduct between a child and older person. Emotional abuse signifies verbal violation on a child's sense of worth or any humiliating and threatening conduct directed toward a child by an older person. Physical abuse denotes bodily assaults on a child by an older person that pose the risk of, or result in, injury. Physical neglect represents the failure of caretakers to provide a child's basic physical needs, including safety, food, supervision, and health. Emotional neglect signifies the frustration of caregivers in providing a child's basic psychological and emotional needs, such as attachment, support, love, and encouragement.” (Bernstein et al., 2003). Each item is scored on a five-point Likert scale from “never true” (1) to “very often true” (5) and producing scores ranging from 5 (no history of abuse) to 25 (very extreme history of abuse) for each trauma subscale and from 25 to 125 for the total abuse/neglect. The reliability of this test is based on test-retest and alpha ranged from 0.79 to 0.94 (Brodsky et al., 2008; Roy, 2011). The Persian version of this questionnaire which was

employed in this study has satisfactory psychometric properties [Ebrahimi et al., 2013]. In the present study, the Cronbach's alpha coefficient for the subscales of EA, PA, SA, EN, and PN were 0.73, 0.68, 0.49, 0.76, and 0.60 respectively.

Early Maladaptive Schemas' Questionnaire-Short Form (SQ-SF; Young, & Brown, 1994): The SQ-SF assesses 15 EMSs. There are five items per schema, and each schema score can be calculated by summing the ratings on these five items. 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 over vigilance and inhibition (negativity, emotional inhibition, unrelenting standards, punitive-ness). Participants rated items using a 6-point scale (1 = completely untrue of me, 2 = mostly untrue of me, 3 = slightly more untrue than true, 4 = moderately true of me, 5 = mostly true of me, and 6 = describes me perfectly). The Persian version of this questionnaire which was employed in this study has satisfactory psychometric properties (Sadoghi et al., 2008). In the present study, the obtained alpha for the subscales of the defectiveness/shame, social isolation/alienation, abandonment/instability, mistrust/abuse and emotional deprivation were 0.68, 0.81, 0.83, 0.75, and 0.77 respectively. In this study, the schema of disconnection and rejection domain, which is the domain that is strongly associated with depression was assessed using the SQ-SF (Eberhart et al., 2011; Calvete et al., 2005; Calvete, 2014; camara and Calvete, 2012; Orue et al., 2014; Renner et al., 2012; Roelofs et al., 2011).

Leahy Emotional Schemas Scale (LESS; Leahy, 2002): This scale is made up of 50 items that are used to assess how one thinks about his own emotions. The LESS is a six-point Likert scale

for each question (Very true of me =6 to Very untrue of me =1), it includes items regarding how they have dealt with emotional experiences during the last month. It has fourteen dimensions: validation (the belief that other people admit to an individual's emotions), comprehensibility (the opinion that one's emotions make sense), guilt (the view that one's emotions are shameful or misconduct), simplistic view of emotion (the degree of complexity in one's perception of emotional experience and represents tolerating ambivalent feelings), higher values, (the view that an inner emotion can contribute insight into what is important to an individual), controllability (the view that an emotion is controllable), numbness (the view concerning the lack of intensity of emotional experience), need to be rational (the stress on dialectic or anti-emotionality), duration (the anticipation of the duration of emotional experiences), consensus (the belief that others share the same emotions), acceptance of feelings (the extent to which individuals accept their emotion and feelings), rumination (the propensity to ask unsolvable questions and remain with certain emotions), expression (the propensity to experience or express emotions), and blame (the belief that others are responsible for one's emotional experiences; Leahy, 2002).

This scale has two common scores; rigid emotional schemas (sum scores of guilt, simplistic views, numbness, rationality, duration, rumination, blame), and negative beliefs regarding emotions obtain by reversing the points for validation, comprehensibility, higher values, controllability, expression, and acceptance (Batmaz et al., 2014). Leahy (2002) has reported adequate validity and internal consistency for the LESS. Khanzadeh et al., (2013) prepared the Persian version of LESS. In this version, the number of items was reduced to 37 items, by eliminating duration and numbness factors, and adding emotional self-awareness factor, and the number of factors got to 13. The Persian version of this questionnaire that was used in this study

has satisfactory psychometric properties. In the present study, Cronbach's alpha coefficient were 0.59 (expression) to 0.93 (rumination).

Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011): This is a 10-item scale. The high scores depict higher experimental avoidance and if the items are scored inversely, the high scores represent high psychological flexibility. This questionnaire included two factors of emotional avoidance (7 items; e.g., my painful memories prevent me from having a fulfilling life, I'm afraid of my feelings) and life control (3 items). With the use of a 7 point Likert scale (never true=1, always true=7), Participants were asked to indicate how truly each item applies to them. The present study was focused on the experimental avoidance. Bond et al. (2011) reported that the 3 and 12 months test-retest reliability were 0.81 and 0.79, respectively. In Iran Abassi et al. (2012) reported adequate alpha in major depressed people ($\alpha=.70$). The obtained alpha in this study was 0.90.

2.2. Statistical analyses

We computed Pearson correlations between the predictor and outcome variables in SPSS 22.0 in order to test the assessment of basic association between variables. Due to the existence of latent variables (e.g., childhood trauma, disconnection and rejection schemas and negative emotional schemas), authors tested mediational hypotheses by employing nested structural equation models in AMOS 22.0. Mediation was assessed using bootstrapping procedures. Goodness of fit was assessed by the *CMIN/DF* (values of 3.0 or less show that the model adequately fits the data), X^2 (non-significant values $P>0.05$ indicate that the model adequately fits the data) comparative fit index (CFI; values of 0.95 or greater signify that the model adequately fits the data), Goodness of fit index (*GFI*; values of 0.95 or greater indicate that the

model adequately fits the data) Bentler–Bonett normed fit index (*NFI*; values of 0.95 or greater denote that the model adequately fits the data) Tucker-Lewis index (*TLI*; values of 0.95 or greater indicate that the model adequately fits the data), and the root mean squared error of approximation (*RMSEA*; values of 0.08 or less show that the model adequately fits the data). Missing data were handled using listwise deletion.

3. Results

3.1. Preliminary Analyses: Descriptive statistics and correlation between

The means, standard deviations and zero order correlations among the key variables are presented in Table 1. As can be seen, emotional abuse, physical abuse, emotional neglect, physical neglect, abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame, social isolation/alienation, rigid emotional schemas negative beliefs regarding emotions and depressive symptoms were positively correlated ($P < 0.05$).

3.2. Supposed Models Examination:

Examination of the structural equation model (Figure 1) was performed via bootstrapping of the maximum likelihood (5000 times sampling). Sexual abuse was excluded from the study because skewness and kurtosis index were greater than 3 and 8 respectively (Kline, 2011), and also because of the cultural differences. All factor loadings that are presented in Figure 2 were significant ($P < 0.01$). The index demonstrated good fit ($NFI = 0.93$, $TLI = 0.93$, $GFI = 0.94$, $CFI = 0.95$, $CMIN/df = 3.03$, $\chi^2_{56} = 169$, $P < 0.0001$, $RMSEA = 0.068$). Findings also showed that childhood trauma predicted disconnection and rejection schemas ($\beta = 0.56$, $P < 0.0001$) and depressive symptoms ($\beta = 0.11$, $P < 0.05$). Disconnection and rejection schemas predicted negative emotional schemas ($\beta = 0.74$, $P < 0.0001$), experimental avoidance ($\beta = 0.26$, $P < 0.001$) and

depression ($\beta = 0.17$, $P < 0.05$). Negative emotional schemas predicted both experimental avoidance ($\beta = 0.50$, $P < 0.0001$) and depression ($\beta = 0.58$, $P < 0.0001$). Finally, experimental avoidance predicted depression ($\beta = 0.11$, $P < 0.05$). Nevertheless, childhood trauma did not predict negative emotional schemas ($\beta = 0.07$, $P > 0.05$) and experimental avoidance ($\beta = 0.02$, $P > 0.05$) significantly (Figure 2).

3.3. Revised Models Examination:

The next step was to revise the proposed model via elimination of the non-significant paths (CT to the negative emotional schemas and experimental avoidance) and correlating of physical and emotional abuse errors (Figure 3). All factor loadings were statistically significant ($P < 0.01$) in revised model. Goodness of fit index illustrated that the fitness of the modified model was enhanced ($RMSEA = 0.056$, $NFI = 0.94$, $TLI = 0.95$, $CFI = 0.97$, $GFI = 0.95$, $CMIN/df = 2.38$, $X^2_{57} = 81.135$, $p < 0.0001$). As can be seen in the model, all direct paths are significant in the modified model ($P < 0.05$). In summary, the final model (Figure 3) explained 62% of the variance in depression severity.

3.4. Examining the significance of indirect effects

In the present study, the 95% confidence interval (CI) of the indirect effects was obtained with 5000 bootstrap samples. The final step was to determine if the 95% CI for the estimated indirect effect included zero. An indirect effect is significant at the 0.05 level if the 95% CI does not include zero. Indirect paths are significant because the lower and upper bounds do not include zero (Table 2). The CT pathway to depression was associated with disconnection/rejection schemas ($\beta = 1.13$, 95% CI = 0.90 to 1.42). The standardized parameter estimates revealed that

childhood trauma was significantly related to higher levels of depression symptoms through disconnection/rejection schemas. The childhood trauma contributed significantly to negative emotional schemas ($\beta = 0.69$, 95% CI = 0.54 to 0.87) and experimental avoidance ($\beta = 1.11$, 95% CI = 0.89 to 1.39) through disconnection/rejection schemas. The disconnection/rejection schemas pathway to depression was associated with negative emotional schemas and experimental avoidance ($\beta = 1.38$, 95% CI = 1.27 to 2.18). In other word, higher levels of disconnection/rejection schemas contributed significantly to depression symptoms through negative emotional schemas and experimental avoidance. Finally, negative emotional schemas pathway to depression was related to experimental avoidance ($\beta = 0.11$, 95% CI = 0.03 to 0.21).

4. Discussion

The present research was designed to support and bridge the space between theory and data and add to the growing body of study on developmental and schema-level caused by testing a model which evaluated the role of childhood trauma on the development of maladaptive cognitive (early maladaptive schemas), behavioral (experimental avoidance) and emotional (emotional schemas) structures which may be essential in explaining the depression. In other words, the main objective of the present study was testing the fitness of the supposed model and developing association between childhood trauma and depression through mediating early maladaptive schemas, emotional schemas, and experimental avoidance.

The results revealed that childhood trauma predicted depression symptoms, both directly and through the disconnection and rejection domain. Thus, the results indicate that women who are under the impression that their basic needs of security, nurturance and stability, were not achieved (i.e., disconnection and rejection schemas) are at elevated risk of developing depressive

symptoms. Specifically, Disconnection/rejection schemas include contents of worthlessness, or feeling of “I have not felt that I am special to somebody”. These themes suggest that people who have been experiencing childhood trauma develop schemas that they are rejected and not lovely. These findings are in agreement with the results of the previous studies (Calvete, 2014; Halvorsen et al., 2010; Lumley and Harkness, 2007; Michopoulos et al., 2015; Khosravani et al., 2016; Miron and Orcutt, 2014; Orue et al., 2013; Wright, et al., 2009). The present results are also consistent with Young’s (Young et al., 2003) model of early maladaptive schemas formation, implying that early maladaptive schemas are created through the childhood maltreatment. In accordance with this theory, emotional abuse, physical abuse, emotional neglect and physical neglect tested in this present study, correlated with disconnection/rejection schemas. In contrast to the hypothesis of the current study and in contradiction with previous researches (Aldao et al., 2010; Bell and Higgins, 2015; O’Mahen et al., 2015), the childhood trauma did not predict depression symptoms through the negative emotional schemas and experiential avoidance but in accordance with the present study, Westpha et al. (2016) established that parental abuse did not predict depression through emotional invalidation, which is a specific type of negative emotional schemas. The first aspect which may be connected to this discrepancy is the different cultural factors regarding the concept of emotions and avoidance. One view about emotion and avoidance in a Western culture may not be the same in an Eastern culture, and vice versa. Thus, individuals may be feeling the same about rigid emotions (such as guilt, simplistic view of emotions, lack of acceptance and numbness) irrespective of feeling abused and depressed, but may differ in their interpretations of the sameness of their feelings in different cultures (Batmaz et al., 2014). People in Eastern culture (collectivistic culture) as compared to Western culture (individualistic culture) are more liable to remain in undesirable

condition (lack of avoidance; Diener, 2000). Second, avoidance and emotional schemas are multifaceted concepts. Different components of avoidance (emotional, behavioral and cognitive) and emotional schemas (such as rumination) may be related to different contextual and childhood developmental factors. On the other hand, different types of childhood trauma are connected to different pathways associated with psychopathology, and these pathways maybe determined by different emotion regulation strategies (Bell and Higgins, 2015; Leahy et al., 2011). For example O'Mahen et al. (2015) established that rumination only mediated the relationship between emotional abuse and depression and avoidance only mediated the relationship between emotional neglect and depression. Also, Gratz et al. (2007) discovered that emotional non-acceptance only mediated the relationship between emotional abuse and experimental avoidance among a sample of substance users. Although we calculated only total effect of childhood trauma. It may be useful in future research to explicate different components of experimental avoidance and emotional schemas as they may be related to different childhood trauma subtypes. Third, Gayer-Anderson et al. (2016) and Samplin et al. (2013) reported that females are more resilient to the neurological effects of childhood but they are not more resilient to the psychiatric symptoms connected with childhood maltreatment especially in individuals who report severe abuse and low levels of social support in adulthood. However, authors did not control the severity of abuse and social support

In this study, we hypothesized that disconnection and rejection schemas would contribute to the depressive symptoms through the negative emotional schemas and experimental avoidance. The findings revealed that disconnection and rejection schemas anticipated depression symptoms both directly and through the negative emotional schemas and experimental avoidance. These results are also significant because they validate the supposition of schema therapy (Young et al.,

2003). According to schema therapy, the early maladaptive schemas mediate between maladaptive coping styles (i.e., avoidance, overcompensation and surrender) and distress. The maladaptive coping styles results in three basic responses to threat (i.e., flight, fight, and freeze, respectively). Hence, the experimental avoidance may be understood as a maladaptive coping strategy in accordance with the notion of surrender of schema therapy. Similar findings were found by Gallagher and Gardner (2007) in a study with injured athletes. They discovered that early maladaptive schemas and avoidance-focused coping are related with each other and higher levels of negative mood. These results are in agreement with the findings of previous studies that established that rumination, as cognitive avoidance (Eisma et al., 2015), mediated between early maladaptive schemas and depression (Calvete, 2014; Orue et al., 2014). In other words, according to the schema therapy, the early maladaptive schemas develop cognitive, behavioral and emotional coping styles (Young et al., 2003). In particular, negative emotional schemas may be seen as emotional coping strategy in accordance with the notion of surrender of schema therapy model.

In another hypothesis we assumed that negative emotional schemas would contribute to the depressive symptoms through the experimental avoidance. The results of this study revealed that negative emotional schemas anticipated depression symptoms, both directly and through the experimental avoidance. These findings are in agreement with previous studies (Batmaz et al., 2014; Leahy, 2002; Leahy et al., 2012; Yavuz et al., 2011). According to emotional schema theory (EST; Leahy et al., 2011; Leahy, 2015), emotional schemas may have a vital role in determining if individuals are ready to engage in challenging emotions. From this approach, negative emotional schemas reflect response patterns to emotions that result in experimental avoidance. In other words, individuals differ in their appraisals of their emotional experience

(i.e., emotional schemas) and may attempt to cope with their emotions through experimental avoidance (Leahy, 2015) and several studies have found that experimental avoidance lead to depression (Biglan et al., 2015; Brockmeyer et al., 2015; McCracken et al., 2015; Ottenbreit et al., 2014).

Some limitations of the present study need to be highlighted. First, it should be considered that the current investigation is a cross-sectional study so it is impossible to draw any causal relationships among the predictive variable and depression. Future studies should replicate the study with longitudinal design. Second, this study consisted only disconnection and rejection domains that were most related to depressive symptoms in previous studies. Future studies should use other schema domains. Third, this study is mostly depended on self-report measures which are open to bias. Fourth, limitation refers to the sample, which is formed exclusively of female college students and the results may not be reproducible in men. Future studies should repeat the study with male sample. Finally, similar to some previous studies (e.g., Bailer et al., 2014; Hopfinger et al., 2016), we did not control the severity of depression. Particularly, students with a current major depression are in a lower mood and as a result may more likely report childhood maltreatment than students with history of depression. Therefore, future research should control the severity of depression that may modify the relationships of childhood trauma with depression, emotional schemas and experimental avoidance.

In spite of these limitations, the current study accounted for 62% of the variance in women with major depressive disorder and who have history of major depressive disorder. Significantly, the present study shows that disconnection and rejection schemas mediate between childhood trauma and depressive symptoms. Similarly negative emotional schemas and experimental avoidance mediate between disconnection and rejection schemas and depression. It is important

because it confirms the assumptions of the schema therapy (Young et al., 2003). Another result of this study is that it depicts negative emotional schemas and predicts depression symptoms through experimental avoidance. It supports the assumptions of the emotional schema therapy (Leahy, 2015). Clinically, results have implications for treatment. The findings of this study suggest that the interventions of depression should be focused on trans-diagnostic role of disconnection and rejection schemas, emotional schemas and experimental avoidance. Additionally, interventions should consider that the experience of childhood trauma pose a risk factor for the development of depression.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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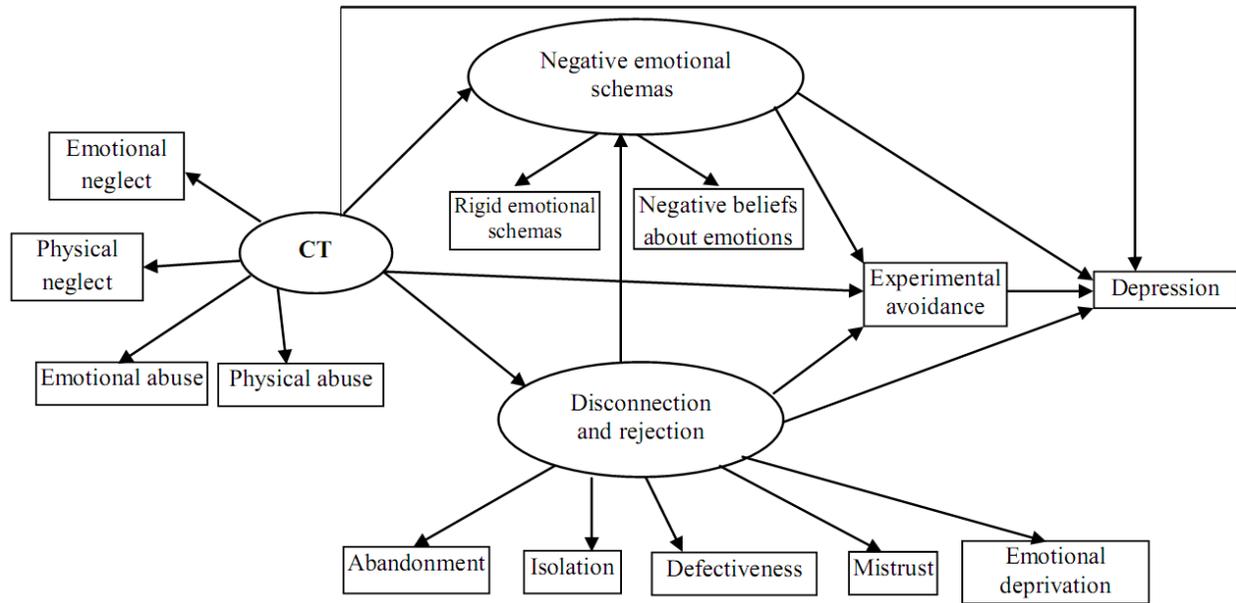


Fig. 1. Full mediational path model. Note: CT; childhood trauma

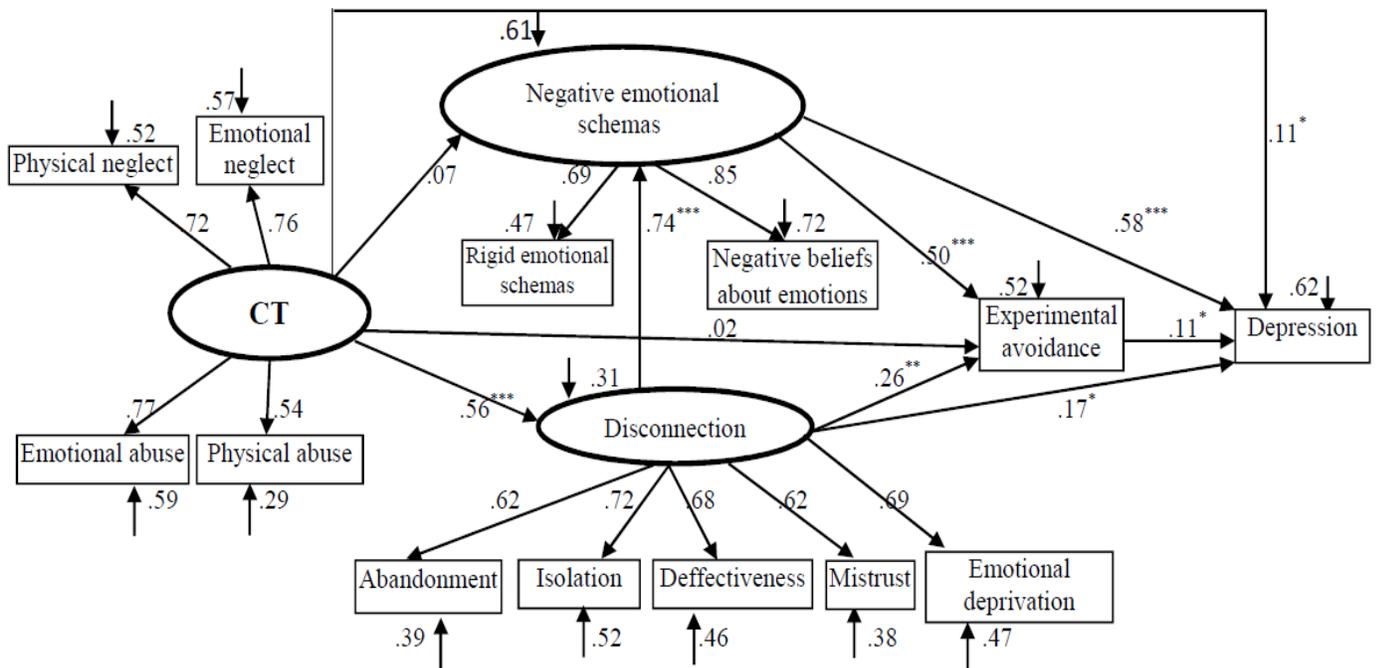


Fig. 2. Proposed Model for Depression. * $P < 0.05$, ** $P < 0.001$, *** $P < 0.0001$. Note: CT; childhood trauma, Disconnection; disconnection and rejection schemas

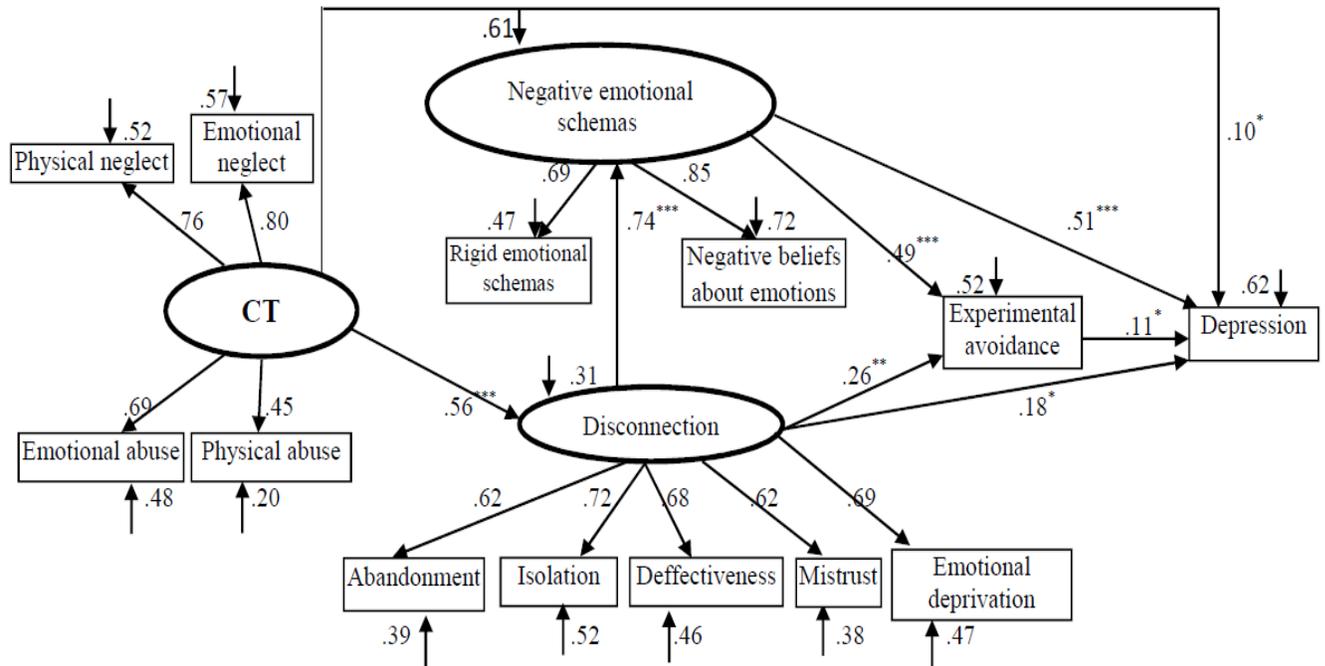


Fig. 3. The Modified Model for Depression. * $P < 0.05$, ** $P < 0.001$, *** $P < 0.0001$. **Note:** CT; childhood trauma, Disconnection; disconnection and rejection schemas

Table 1 Descriptive statistics and correlation among childhood trauma, early maladaptive schemas, emotional schemas, Experimental avoidance and depression

variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Emotional abuse	-	.52*	.53*	.50*	.41*	.29**	.37*	.39**	.26**	.32**	.37**	.33**	.46**
2. Physical abuse		-	.37*	.32*	.25*	.13**	.14*	.23**	.13**	.15**	.16**	.15**	.23**
3. Emotional neglect			-	.65*	.32*	.23**	.25*	.32**	.11*	.19**	.31**	.27**	.33**
4. Physical neglect				-	.26*	.19**	.25*	.29**	.13**	.16**	.28**	.24**	.30**
5. Defectiveness/Shame					-	.47**	.51*	.50**	.36**	.29**	.47**	.40**	.44**
6. Abandonment						-	.59*	.39**	.38**	.31**	.39**	.44**	.45**
7. Emotional deprivation							-	.45**	.47**	.32**	.43**	.44**	.48**
8. Isolation								-	.48**	.40**	.52**	.47**	.49**
9. Mistrust									-	.37**	.40**	.43**	.47**
10. Rigid emotional schemas										-	.58**	.52**	.52**
11. Negative beliefs about											-	.58**	.65**

emotion														
12. Experimental avoidance														.62**
13. depression														-
mean	7.4	5.6	9.7	8.6	9.1	10.5	8.6	12.0	11.2	49.5	70.9	20.3	15.5	
Standard deviation	1	9	8	3	4	7	5	3	3	2	3	2	5	
	.50	.07	.19	.15	.21	.23	.18	.26	.28	.30	.49	.48	.50	

* $P < 0.05$, ** $P < 0.01$

Table 2 The indirect and total effects of all paths through bootstrapping for the modified model ($N=439$).

paths	B	β	S.E	bootstrap 95% CI	
				Lower bound	Upper bound
<i>Indirect effect on negative emotional schemas</i>					
CT \rightarrow DR \rightarrow NES	.43	.69	.10	.54	.87
<i>Indirect effect on experimental avoidance</i>					
CT \rightarrow DR \rightarrow EA	.35	1.11	.15	.89	1.39
DR \rightarrow NESs \rightarrow EA	.39	1.33	.29	.91	1.89
<i>Indirect effects on depressive symptoms</i>					
CT \rightarrow DR \rightarrow Depression	.35	1.13	.16	.90	1.42
DR \rightarrow NESs and EA \rightarrow Depression	.54	1.38	.28	1.27	2.18
NESs \rightarrow EA \rightarrow Depression	.05	.11	.06	.03	.21
Total effect of CT on depression	.45	1.46	.20	1.15	1.81
Total effect of DR on depression	.64	2.27	.24	1.91	2.70
Total effect of NESs on depression	.56	1.12	.20	.84	1.48

Note: CT: childhood trauma; NESs: negative emotional schemas; DR: disconnection and rejection schemas; EA: experimental avoidance.

Highlights

- Disconnection and rejection schemas was mediator of the relation between childhood trauma and depression.
- Disconnection and rejection schemas affected depression through negative emotional schemas and experimental avoidance.
- Experimental avoidance was mediator of the relation between negative emotional schemas and depression.
- CT did not predict depression symptoms, through the NESs and EA.