



| Research Article / Araştırma Makalesi |

Investigation of Relations between Emotion Regulation, Early Maladaptive Schemas, Cognitive Flexibility, and Rumination¹

Duygu Düzenleme ile Erken Dönem Uyumsuz Şemalar, Bilişsel Esneklik ve Ruminasyon Arasındaki İlişkilerin İncelenmesi¹

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Keywords

- 1.emotion regulation
- 2.early maladaptive schemas
- 3.cognitive flexibility
- 4.rumination

Anahtar Kelimeler

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Abstract

Purpose: The main purpose of this study was to investigate the validity of the structural model that is composed of the emotion regulation, early maladaptive schemas, cognitive flexibility and rumination.

Design/Methodology/Approach: This study was carried out with 454 students (%63.2 female, %36.8 male). The data used in this study was adopted from Personal Information Form, Young Schema Questionnaire-Short Form 3, Emotion Regulation Questionnaire, Cognitive Flexibility Inventory and short form of Rumination Scale.

Findings: As a result of the structural equation modelling; the participants' early maladaptive schemas were significant predictors of cognitive flexibility's sub dimensions. Cognitive flexibility's sub dimensions predicted the rumination's sub dimensions, rumination's brooding sub dimension were found significant predictor of expressive suppression and cognitive reappraisal which are sub dimensions of emotion regulation and also rumination's reflection sub dimension predicted the cognitive reappraisal but not expressive suppression.

Highlights: When early maladaptive schemas are active, cognitive flexibility level decreases. Therefore, ruminative thoughts increase and these thoughts are unable to regulate emotions. Psychoeducation programs can be developed in order to increase cognitive flexibility levels, use effective emotion regulation strategies and cope with ruminative thinking.

Öz

Çalışmanın amacı: Bu araştırmanın temel amacı; duygu düzenleme (bilişsel yeniden değerlendirme ve bastırma alt boyutları), erken dönem uyumsuz şemalar, bilişsel esneklik (alternatifler ve kontrol alt boyutları) ve ruminasyon (saplantılı ve derin düşünme alt boyutları) değişkenleri ile oluşturulan yapısal modelin geçerliğinin incelenmesidir.

Materyal ve Yöntem: Araştırmanın çalışma grubunu; 454 (%63.2 kadın, %36.8 erkek) üniversite öğrencisi oluşturmaktadır. Modelin geçerliği yapısal eşitlik modellemesi analizi ile gerçekleştirilmiştir. Araştırmada veriler; Kişisel Bilgi Formu, Duygu Düzenleme Ölçeği, Young Şema Ölçeği Kısa Form-3, Bilişsel Esneklik Envanteri ve Ruminasyon Ölçeği Kısa Formu ile elde edilmiştir.

Bulgular: Yapısal eşitlik modellemesi sonucunda; erken dönem uyumsuz şemaların bilişsel esnekliğin alt boyutlarını yordadığı, bilişsel esnekliğin alt boyutlarının ruminasyonun alt boyutlarını yordadığı, ruminasyonun saplantılı düşünme alt boyutunun duygu düzenlemenin alt boyutları olan bilişsel yeniden değerlendirme ve bastırma alt boyutunu yordadığı, ruminasyonun alt boyutu olan derin düşünmenin ise bilişsel yeniden değerlendirmeyi yordadığı ancak bastırma alt boyutunu yordamadığı sonucuna ulaşılmıştır.

Önemli Vurgular: Bulgular, erken dönem uyumsuz şemalar etkin hale geldiğinde; bilişsel esneklik düzeyinin azaldığına, ruminatif düşüncelerin arttığına ve ruminatif düşüncelerin artmasının duyuların uygun bir şekilde düzenlenememesine neden olabileceğine işaret etmektedir. Bireylerin; bilişsel esneklik düzeylerini artırma, etkili duygu düzenleme stratejilerini kullanma ve ruminatif düşünceyle baş edebilmeleri amacıyla psikoeğitim programları geliştirilebilir.

¹This study is based on the first author's master thesis (mentored by the second author) presented to Ankara University.

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INTRODUCTION

Emotions have an important role in people's lives. People experience various different emotions as a result of emotional stimuli in their daily lives, and try to cope with emotions while they get in touch with themselves or others. According to Tuğrul (1999), emotions are of great importance to understand people, and make sense of their thoughts and behaviours. The term 'emotion' is used frequently in daily life as well as in the literature of psychology (Gross, 1999). Although emotions cause different problems, they generally facilitate decision-making, motivate people to produce immediate reactions, provide them with information about an organism and environment. Emotions also have social functions. Emotions give people an idea about behavioural intentions of other people, whether they do something well or not, and also about their own social behaviours (Gross, 1998).

Individuals try to deal with their emotions through effective or ineffective methods (Leahy, Tirsch and Napolitano, 2011). The concept of emotion regulation turns out to be more important about dealing with emotions. Emotion regulation is a broad term, and it can be used in many different ways. Gross (1998) describes emotion regulation as a process focusing on which emotions individuals have, how they experience these emotions and how they express their emotions. Emotion regulation is also defined as the conceptualization of psychological, behavioural and cognitive processes that help people change and adjust positive as well as negative experiences and expressions (Bridges, Denham and Ganiban, 2004).

The number of studies on emotion regulation has increased in recent years (Ghosh and Halder, 2020). Studies on emotion regulation show that the related issues examined in the literature include cognitive flexibility, depression, eating problems, anxiety, stress, rumination, self-compassion, psychological help seeking, well-being and adaptation problems (Bardeen, Kumpula and Orcutt, 2013; Bilgiz and Peker, 2018; Cisler and Olatunji, 2012; Cole, Michel and Teti, 1994; Ghosh and Halder, 2020; Gün, Türkmen and Yalçın, 2020; Kring and Sloan, 2010; Ma, Bryant and Hou, 2020; Özbay, Palancı, Kandemir and Çakır, 2012). Furthermore, literature review shows that negative childhood experiences are related to the difficulty of emotion regulation (Cloitre, Miranda, Stovall-McClough and Han, 2005). Negative experiences in early childhood strengthen negative emotions, and lead individuals to avoid their own emotions when they come across similar situations. This avoidance in turn can lead to maladaptive coping strategies (Young, Klosko and Weishaar, 2003). Traumatic interpersonal childhood experiences such as ignorance or abuse direct the process of emotion regulation in adulthood (Cloitre and others, 2005; Fassbinder, Schweiger, Martius, Wilde and Arntz, 2016) As is seen, childhood period has an important function in understanding emotions, emotion regulation and the process of emotion regulation (Calkins, 2010; Young, Klosko and Weishaar, 2003).

According to Young, Klosko and Weishaar (2003), there are some basic emotional needs that should certainly be met during childhood to achieve a healthy developmental period. When childhood needs are not met, or are met excessively, early maladaptive schemas arise. Previous studies in the literature reveal that individuals' emotional reactions are expressed by rules determined by early maladaptive schemas (Masomi, Hejazi and Sobhi, 2014; Young, Klosko and Weishaar, 2003). It is also noted in the literature that the schema domain of disconnection/rejection that includes being abandoned, distrust, emotional deprivation and faultiness can be influential in the creation of negative mental representation, and these mental representations can negatively affect individuals' emotion regulation skills and close relationships all throughout their life (Mikulincer and Shaver, 2007; cited by Demirli Yıldız, 2018). Kılınç and Önder (2019) carried out a study in which they found out that there is a medium-level relation between early maladaptive schemas and methods of emotion regulation, and indicated that the direction of this relationship differs according to sub-scales. On the other hand, non-functional methods of emotion regulation predict different maladaptive schemas. As is seen, existence and level of early maladaptive schemas are related to the difficulty of emotion regulation (Young, Klosko and Weishaar, 2003).

The related literature shows that there is a relationship between early maladaptive schemas and emotion regulation. There are also studies in the literature which address early maladaptive schemas and variables of emotion regulation together with other variables. Previous studies in the literature show that early maladaptive schemas and variables of emotion regulation are associated with social phobia (Eldoğan, 2012), mourning (Kaya Demir, 2020), psychological disorders (Balaban, 2020; Yakın, Gençöz, Steenbergen and Arntz, 2019) and psychological well-being (Ayan, 2019). Literature review shows that cognitive flexibility is another variable that plays an important role in the relation between early maladaptive schemas and emotion regulation. Cognitive flexibility is the ability to change the current cognitive structures in order to adapt to changing environmental stimuli (Dennis and Vander Wal, 2010). It is clear that individuals' level of cognitive flexibility is also affected by the communication style within the family during childhood, which is a part of their schemas (Koesten, Schrodts and Ford, 2009). Cognitive flexibility is a quality that is acquired in interpersonal relations, and this quality is extensively affected by age and parental attitudes (Bilgin, 2009). It seems possible to indicate that family environment and domestic violence during childhood play a significant role in the formation of schemas and are influential on individuals' level of cognitive flexibility. Existence of early maladaptive schemas that are formed in the early period of life and affect people's lives can cause people not to be able to be flexible in cognitive terms. Not being able to be flexible cognitively prevents people from directing their attention to other ways away from themselves and their problems (Martin, Oren and Boone, 1991). This can lead someone to ruminative thinking.

There are studies in the literature that reveal a relation between cognitive flexibility and rumination (Davis and Nolen-Hoeksema, 2000; Owens and Derakshan, 2013). Related studies show that not being flexible cognitively is associated with having ruminative thoughts (Genet, Malooly and Siemer, 2013). Not being flexible cognitively increases rumination, and causes people not to be able to stay away from their problems (Davis and Nolen-Hoeksema, 2000). There are a number of definitions and

opinions about the concept of rumination in the related literature (Bringle, 1996; Nolen-Hoeksema, Wisco and Lyubomirsky, 2008). Rumination means focusing on an emotional state as well as its possible causes and results repeatedly in a passive way instead of taking a step to solve the problem (Nolen-Hoeksema, Wisco and Lyubomirsky, 2008).

Rumination is also regarded as a dysfunctional strategy of emotion regulation. According to Leahy (2002), as rumination increases, people have more difficulty in expressing their emotions. Individuals who have ruminative thoughts are mostly occupied with their negative emotions (Ehring and Ehlers, 2014). Those people isolate themselves, and focus on their problems and the negative emotional state created by these problems (Nolen-Hoeksema and Morrow, 1991). Previous studies show that rumination is associated with depression and symptoms of anxiety (Rood, Roelofs, Bögels, Nolen-Hoeksema and Schouten, 2009), and so it triggers more negative emotions (Moberly and Watkins, 2008) and less positive emotions (Nezlek and Kuppens, 2008). However, there is also a relation between positive rumination and positive emotions (Ma, Bryant and Hou, 2020). Positive rumination structures address how individuals have positive emotions and how they experience these emotions (Feldman, Joormann and Johnson, 2008). Indeed, positive rumination refers to emotion regulation processes consisting of thinking about positive emotions and thoughts (Gruber, Eidelman, Johnson, Smith and Harvey, 2011). As is clear, whether it is a positive or negative rumination process, ruminative individuals have difficulty in regulating their emotional states, they cannot divert their attention from that stimulus by making use of effective emotion regulation strategies, and they cannot cope with their emotions.

The concepts of cognitive flexibility and rumination, which are thought to play a role in the relation between early maladaptive schemas and emotion regulation, have been addressed above. Literature review shows that there is not a study in the literature which examines the relation among emotion regulation, early maladaptive schemas, cognitive flexibility and rumination. However, there are some studies about these concepts conducted with a participant group consisting of university students in Turkey. Akhun (2012) investigated the relationship of perceived parenting styles, early maladaptive schemas, self construal, separation-individuation, and difficulties of emotional regulation to psychological distress in Turkish university students. The study group was composed of 844 university students. According to the study results, as the age of the participants increased, the difficulty of emotion regulation they experienced decreased. It was concluded in the study that the mediating role of the difficulty in emotion regulation predicted perceived parenting style, early maladaptive schemas and psychological symptoms at a statistically significant level. In another study, Eldoğan (2012) investigated the mediator role of emotion regulation difficulties on the relationship between early maladaptive schemas and the symptoms of social phobia in university students. The study group was composed of 240 university students. The study results indicate that the individuals who have a high and medium level of symptoms as to social phobia experience difficulty in emotion regulation more than those having a low level of social phobia. It was revealed that, there was a mediator role of emotion regulation difficulties on the relationship between Disengagement, Impaired Autonomy and Impaired Limits schema domains and the symptoms of social phobia. Pektaş (2015) also carried out a study which aimed at investigating the relation between the symptoms of depression and anxiety in university students and acceptance, rejection and control by parents, as well as the mediating role of the difficulties in emotion regulation in this relation. The study group consisted of 352 university students. It was found out in the study that there were statistically significant positive relations between parental rejection and each dimension of difficulties in emotion regulation of university students. In another study conducted by Şahin and Ramazan (2016), it was concluded that there was a statistically significant positive relation between the sub dimension of "cognitive flexibility" regarding executive functions and emotion regulation skills. Another study which was conducted with 253 university students aimed at investigating whether individuals' early maladaptive schemas predict their level of happiness or not, and identifying which early maladaptive schemas can be a barrier to happiness. At the end of the study, it was concluded that university students' early maladaptive schemas of pessimism and failure predict their level of happiness (Yalçın, Ak, Kavaklı and Kesici, 2018). Ayan (2019) also carried out a study to investigate the relation between the difficulty in emotion regulation and early maladaptive schemas, and it was found out that as the number of early maladaptive schemas increases, the difficulty in emotion regulation increases as well.

As is seen above, previous studies in the literature reveal that early maladaptive schemas affect individuals' emotions (Camara and Calvete 2012; Yalçın, Ak, Kavaklı and Kesici, 2018) and behaviours (Young, Kolosko and Weishaar, 2009), these are important for both emotional and cognitive structures (Welburn, Coristine, Dagg, Pontefract and Jordan, 2002), and they play a significant role in individuals' emotion regulation processes. Therefore, it seems important to identify through which variables the relation between these two variables occur. Within this framework, the problem of this study is to investigate the relation between emotion regulation and early maladaptive schemas, cognitive flexibility as well as rumination. The findings of the current study are expected to be helpful for practitioners in the field in terms of raising awareness about the effect of early period life experiences on the acceptance of emotions, defining and being aware of one's emotions, difficulty in emotion regulation and emotion regulation strategies.

In the light of the information given above, a model was developed to test the relations between emotion regulation (sub dimensions of cognitive reappraisal and expressive suppression) and early maladaptive schemas, cognitive flexibility (sub-dimensions of alternatives and control) and rumination (sub dimensions of brooding and reflection). The hypotheses of the current study are as below:

H1=The variable of early maladaptive schemas predicts the sub dimensions of cognitive flexibility (control and alternatives) at a statistically significant level.

H2=The sub dimensions of cognitive flexibility (control and alternatives) predict the sub- dimensions of rumination (reflection and brooding) at a statistically significant level.

H3=The sub dimensions of rumination (reflection and brooding) predict the sub dimensions of emotion regulation (expressive suppression and cognitive reappraisal) at a statistically significant level.

METHOD

Research Model

The current study is based on relational screening model in order to identify the relations between emotion regulation and early maladaptive schemas, cognitive flexibility and rumination. Relational screening model intends to measure the presence and degree of the change between two or more variables (Karasar, 2008). In the current study, the relations between emotion regulation and early maladaptive schemas, cognitive flexibility and rumination were analysed via structural equation modelling. Structural equation modelling is a method of analysis that enables the researcher to analyse the relation among several variables in a structural model at the same time, and makes analysis taking measurement errors into account. Structural equation modelling is a comprehensive statistical approach that helps one to test the hypotheses about relations between observed and latent variables (Hoyle, 1995; cited by Çokluk, Şekercioglu and Büyüköztürk, 2016).

The Study Group

The study group of the research consists of 454 students (%63.2 female, %36.8 male) studying at various state and foundation universities in Ankara. A total of 454 people, 287 (%63.2) female and 167 (%36.8) male, participated in the study. The average age of these individuals whose age ranges were between 18-36 is $\bar{X} = 21.32$. Of the total participants, 80 (%17.6) were first grade, 175 (%38.5) second grade, 108 (%23.8) third grade, 91 (%20.0) fourth grade university students. When the distribution of the participants according to their faculties was examined; 81 (%17.8) university students from the Faculty of Commercial Sciences, 60 (%13.2) university students from the Faculty of Economics and Administrative Sciences (13.2%), 82 (%18.1) university students from the Faculty of Engineering (18.1%), 177 (%39.0) university students from the Faculty of Education (39.0%) and 54 (%11.9) university students from the Faculty of Medicine.

The Data Collection Tool

Personal Information Form

Personal Information Form was developed by researcher in order to collect some sociodemographic information including age, gender, grade level, faculty, department, mother and father's education level. Personal information form was multiple-choice and closed-ended questions which seeking the answer to the demographic features of the participants.

Emotional Regulation Questionnaire (ERQ)

Emotional Regulation Questionnaire was used in the study to measure the emotion regulation levels of the university students. The ERQ was developed by Gross and John (2003) in order to measure individuals' strategies to cope with their emotions and feelings. The ERQ (Gross and John, 2003) has 10 items assessing Cognitive Reappraisal (six items) and Expressive Suppression (four items). The scale is a 7-point Likert type. In terms of psychometric properties; for internal consistency Cronbach's alpha was found as .79 for cognitive reappraisal and .73 for expressive suppression (Gross and John, 2003). The scale was adapted to Turkish by Yurtsever (2004). Cronbach alpha for Cognitive Reappraisal was .88 and for Expressive Suppression .82 in ERQ's Turkish version. In this study, confirmatory factor analysis was conducted to test the construct validity of the ERQ. Confirmatory factor analysis results showed that the values obtained are within acceptable limits [$\chi^2 = 137.72$, $sd = 33$, $RMSEA = .084$, $NNFI = .92$, $CFI = .94$, $GFI = .94$, $standardize\ RMR = .067$]. In the current study, Cronbach alpha was found for cognitive reappraisal .78 and expressive suppression .74.

Young Schema Questionnaire Short Form Version 3 (YSQ-S3)

The questionnaire was developed by Young, Klosko ve Weishaar (2003) to assess early maladaptive schemas. This scale includes 90 items regarding 18 schemas and five domains which is 6-point Likert type. Higher scores indicate more maladaptive beliefs. The scale was adapted to Turkish by Soygüt, Karaosmanoğlu ve Çakır (2009). The Turkish version of the scale has 14 early maladaptive schemas represented under 5 domains which can be listed as disconnection and rejection, impaired autonomy and performance, impaired borders/limits, other-directedness, overvigilance and inhibition. In terms of psychometric properties; for internal consistency Cronbach's alpha was found for schema dimensions as between .63 and .80, for schema domains as between .53 and .81. Test-retest reliability correlations ranged from .66 to .82 and from .66 to .83 for schema dimensions and schema domains. In this study, confirmatory factor analysis was conducted to test the construct validity of the YSQ-S3. Confirmatory factor analysis results showed that the values obtained are within acceptable limits [$\chi^2 = 9785.86$, $sd = 3070$, $RMSEA = .069$, $NNFI = .91$, $CFI = .91$, $GFI = .65$, $standardize\ RMR = .077$]. In the current study, Cronbach alpha was found for disconnection and rejection .90, impaired autonomy and performance .91, impaired borders/limits .64, other-directedness .75 and overvigilance and inhibition .76.

Cognitive Flexibility Inventory (CFI)

Cognitive Flexibility Inventory (CFI) was developed by Dennis and Vander Wal (2010). The CFI is a 20-items which is 7-point Likert type scale in order to measure the levels and the types of cognitive flexibility. The scale has two sub dimensions which are alternatives and control. In the alternative sub dimension, the ability to perceive possible situations and alternatives to find solutions to cope with difficult situations is measured. In the control sub dimension, the ability to perceive difficult situations as controllable is measured (Dennis and Vander Wal 2010). Higher scores indicate higher levels of cognitive flexibility. The Cronbach alpha coefficients was found to be .90 for the overall scale, .91 for the first and last measurement for alternatives and .86 in the first and .84 in the last measurement for control sub dimension. The Turkish adaptation of the CFI was conducted by Gülüm and Dağ (2012). For Turkish adaptations process of CFI, 5-point Likert type scaling was used instead of 7-point Likert type scaling. The Cronbach alpha coefficient was found to be .90 for the overall scale, .89 for Alternatives sub dimension and .85 for Control sub dimension. In this study, confirmatory factor analysis was conducted to test the construct validity of the CFI. Confirmatory factor analysis results showed that the values obtained are within acceptable limits [$\chi^2= 582.44$, $sd= 169$, $RMSEA=.073$, $NNFI=.94$, $CFI=.95$, $GFI=.89$, $standardize\ RMR=.077$]. In the current study, Cronbach alpha was found for alternatives .88 and control .83.

The Ruminative Response Scale (RRS)-Short Version

The Ruminative Response Scale was developed by Treynor, Gonzalez, and Nolen-Hoeksema (2003). RRS has a 10 items with two factors namely brooding and reflection, which is 4-point rating scale. Higher scores indicate a high level of ruminative thinking. This short version of the RRS'S internal consistency coefficient for Reflection sub dimension is .72 and for Brooding sub dimension is .77; and the test-retest correlation for Reflection sub dimension is .60, and for Brooding sub dimension is .62 (Treynor, Gonzalez and Nolen-Hoeksema, 2003). The scale was adapted to Turkish by Erdur-Baker and Bugay (2012). The Cronbach alpha coefficient was found to be .85 for the overall scale, and for the sub dimensions reflection and brooding .77 and .75, respectively. In this study, confirmatory factor analysis was conducted to test the construct validity of the RRS. Confirmatory factor analysis results showed that the values obtained are within acceptable limits [$\chi^2= 182.34$, $sd= 34$, $RMSEA=.098$, $NNFI=.94$, $CFI=.95$, $GFI=.93$, $standardize\ RMR=.054$]. In the current study, Cronbach alpha was found for brooding .73 and reflection .78.

Data Collection

The author of the current study got in touch via e-mail with the researchers who had adapted the data collection tools to be used in the current study into Turkish culture. The researchers were given some information about the current study before they were asked for permission to use the data collection tools in the study. The information as to the general properties of the scales, scoring and psychometric studies regarding the scales was received from the researchers. Then "Ethics Committee Approval" was received from the Research Ethics Committee of the Rectorate of the related university in order to implement the data collection tools and conduct the study. Data collection process continued for about three weeks. All the participants gave consent to fill in the scale forms. The participants were given information about the aim of collecting the data, duration of the implementation and privacy. It took participants about 25-30 minutes to complete filling in the scale forms.

Data Analysis

The data set was analysed in terms of missing value and data gathered from 42 participants were excluded from the data set as they hadn't responded to most of the items in scales or any of the items in a whole scale. Therefore, the number of participants decreased from 628 to 586. Standard z score was obtained in order to conduct one-way outlier analysis, and the values higher than +3.00 and lower than -3,00 were excluded from the analysis (Çokluk, Şekercioğlu and Büyüköztürk, 2016). At the end of this step, data gathered from 27 participants were excluded from the data set. 48 outliers obtained via boxplot graphics were also excluded from the data set, and it was seen in the end that the number of participants was 511. Multivariate outliers were analysed by using Mahalanobis distances in the regression (Çokluk, Şekercioğlu and Büyüköztürk, 2016). According to this, data gathered from 57 participants were not included in the analysis, and the following steps were taken with the data of 454 participants. Critical chi-square value was accepted to be .001. Before the analysis was started, the problem of multicollinearity was also checked. When there is a correlation that is equal to or over .90 between independent variables, there is a problem of collinearity (Büyüköztürk, 2011). Because of that, Pearson correlation coefficients were checked first of all, and dual correlations were assessed between the variables, and it was seen that the relations between the variables varied between -.01 and 0.76. The dual correlations between variables are given in Table 1. Variance inflation factor (VIF), condition index (CI) and tolerance values were also checked in order to evaluate the problem of collinearity. It was seen that variance inflation factor (VIF) was lower than 10, tolerance value ($1-R^2$) was higher than .10 and condition index (CI) was lower than 30, which means that there was not a problem of collinearity in the current study. Autocorrelation analysis was conducted by evaluating Durbin Watson coefficient, and Durbin Watson coefficient was found to be 2,09. Therefore, it can be stated that there was no autocorrelation in the current study. A structural equation modelling was established to examine the relations between emotion regulation (sub dimensions of cognitive reappraisal and expressive suppression) and early maladaptive schemas, cognitive flexibility (sub dimensions of alternatives and control) and rumination (sub dimensions of reflection and brooding). After the validity of the hypothetical model was tested via structural equation modelling analysis, the significance of the relations between latent variables was examined. The statistical package programs of SPSS 20 and LISREL 8.7 were used in the current study.

Table 1. Correlations Between the Variables

	1	2	3	4	5	6	7	8	9	10	11
1.Cognitive Reappraisal	-										
2.Expressive Suppression	.06	-									
3.Disconnection and Rejection	-.26**	.30**	-								
4.Impaired Autonomy& Performance	-.27**	.21**	.76**	-							
5.Impaired Limits	.02	-.06	.12**	.16**	-						
6.Other-directedness	-.03	.02	.42**	.49**	.30**	-					
7.Overtolerance and inhibition	-.16**	.24**	.66**	.57**	.27**	.52**	-				
8.Brooding	-.12**	.12**	.49**	.45**	.12**	.41**	.45**	-			
9.Reflection	-.01	.13**	.40**	.28**	.08	.29**	.36**	.68**	-		
10.Control	.30**	-.17**	-.43**	-.47**	-.02	-.29**	-.33**	-.44**	-.33**	-	
11.Alternatives	.41**	-.09*	-.24**	-.22**	.06	.05	-.04	-.02	.08	.37**	-

**p<.01, *p<.05

FINDINGS

In the model included in the current study, the latent variable of early maladaptive schemas is composed of five schema domains, which can be listed as disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, overvigilance and inhibition. The two sub dimensions of cognitive flexibility, control and alternatives, the two-sub-dimensions of rumination, brooding and reflection, the two sub-dimensions of emotion regulation, cognitive reappraisal and expressive suppression constitute the latent variables in the model.

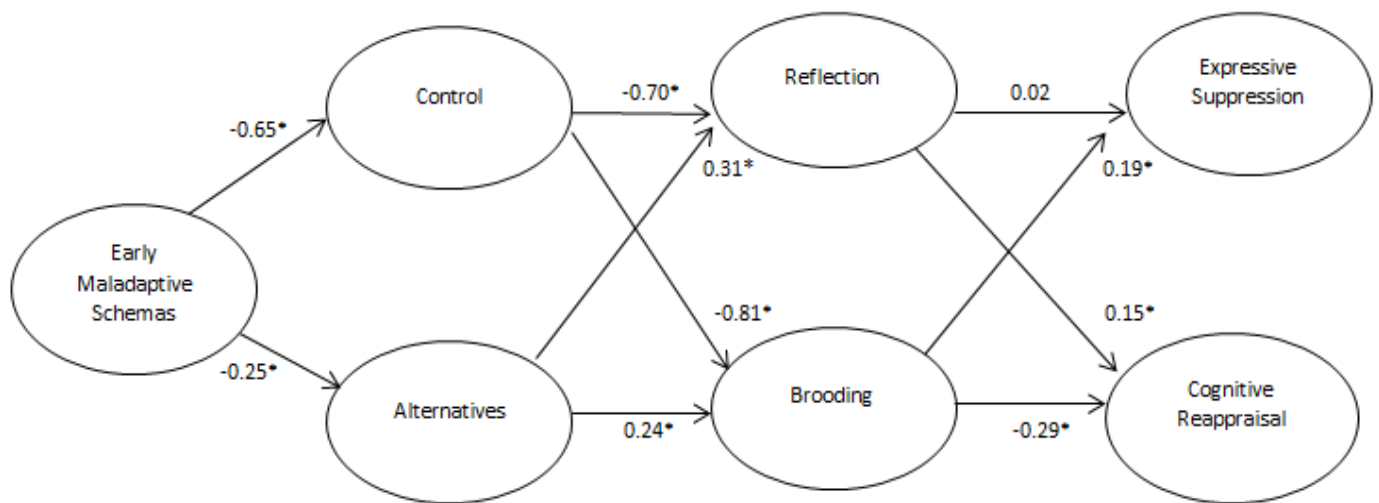
According to the results obtained from the measurement model, goodness of fit indices regarding the measurement model are as below: in degree of freedom of 924, χ^2 was found to be 2270.40 ($p<.01$), $\chi^2/sd= 2.45$, RMSEA=0.057, GFI=0.82, CFI=0.94, IFI=0.94, NNFI=0.94 and SRMR=0.070. Goodness of fit indices in the hypothetical model, in degree of freedom 935, χ^2 was found to be 2781.59 ($p<.01$) $\chi^2/sd=2.97$. Moreover, RMSEA=0.066, GFI=0.79, CFI=0.92, IFI= 0.92, NNFI=0.92 and SRMR=0.10.

The hypothetical model in which the relations between the latent variables in the study were evaluated is given in Figure 1 below. The statistical significance of the relations between the variables in Figure 1 was interpreted considering t values. According to the results given in Figure 1, early maladaptive schemas predicted the cognitive flexibility's sub dimensions significantly. Early maladaptive schemas negatively predicted cognitive flexibility's sub dimension of alternatives ($\beta= -0.25$, $t= -4.48$, $p<.05$) and cognitive flexibility's sub dimension of control ($\beta= -0.65$, $t=-9.95$, $p<.05$). According to this result, it is possible to state that the first hypothesis of the study is confirmed.

The study findings indicate that sub dimensions of cognitive flexibility predict sub dimensions of rumination at a statistically significant level. According to this, cognitive flexibility's sub dimension of alternatives positively predicted rumination's sub dimension of reflection ($\beta=0.31$, $t=6.08$, $p<.05$) and cognitive flexibility's sub dimension of control negatively predicted rumination's sub dimension of reflection ($\beta= -0.70$, $t= -10.01$, $p<.05$). Cognitive flexibility's sub dimension of alternatives positively predicted rumination's sub dimension of brooding ($\beta=0.24$, $t=4.64$, $p<.05$) and cognitive flexibility's sub dimension of control negatively predicted rumination's sub dimension of brooding ($\beta= -0.81$, $t= -8.68$, $p<.05$). According to this result, the second hypothesis of the study is confirmed.

The study findings also reveal that rumination's sub dimension of brooding predicts emotion regulation's sub-dimension of expressive suppression ($\beta=0.19$, $t= 2.37$, $p<.05$) in the positive direction and cognitive reappraisal ($\beta= -0.29$, $t= -3.51$, $p<.05$) in the

negative direction at a statistically significant level. Rumination's sub dimension of reflection predicts emotion regulation's sub dimension of cognitive reappraisal ($\beta=0.15$, $t=2.07$, $p<.05$) in the positive direction at a statistically significant level. However, the latent variable of reflection does not predict the latent variable of expressive suppression ($\beta=0.02$, $t=0.33$, $p>.05$) at a statistically significant level. In this case, it can be stated that the third hypothesis of the current study is partly confirmed.



* $p<.05$

Figure 1. Structural Model Showing the Relations Between Latent Variables in the Hypothetical Model

DISCUSSION

Analysis of structural equation modelling indicate that the hypothetical model representing the relations suggested in the light of theoretical framework between early maladaptive schemas, cognitive flexibility, rumination and emotion regulation is valid.

Structural equation modelling reveals that early maladaptive schemas predict cognitive flexibility at a statistically significant level. The study findings show that individuals who have early maladaptive schemas have a low level of cognitive flexibility. Literature review shows that there is not a study in the literature that examines the relation between early maladaptive schemas and cognitive flexibility although there is a great deal of theoretical knowledge that supports the current finding. As is addressed in the theoretical framework of the study, executive functions start to develop at an early age in life. This development continues throughout childhood and adolescence, and starts to decrease during late adulthood (Anderson, 2002). In this context, it seems possible to say that types of relations that individuals establish in the early years of their lives influence executive functions, cognitive flexibility and psychological symptoms (Gündüz, 2013). Cognitive flexibility is significantly affected by parental attitudes (Bilgin, 2009). Previous studies on the topic show that individuals' level of cognitive flexibility is also affected by the type of communication within the family which they are exposed to during childhood and which has become a part of their schemas (Koesten, Schrodt and Ford, 2009). Thoughts and beliefs that are established as a result of early life experiences can cause psychological problems when they are strong, strict, resistant to change and not functional (Sungur, 1994). For instance, it is assumed that psychological disorders result from negative cognitions, and cognitions are resistant to change. These cognitions are composed of negative thoughts that are not flexible in cognitive terms (Bilgin, 2009). Therefore, it seems possible to indicate that family environment during the childhood plays a significant role in establishing schemas and are influential on individuals' level of cognitive flexibility. Beck (1967) expresses that individuals perceive the world in line with their own thoughts and schemas. It is of high importance to replace cognitively inflexible and strict, dysfunctional and polarized (in an all-or-none style) thoughts, early maladaptive schemas, illogical beliefs and assumptions by appropriate and functional ones. Individuals who do not have cognitive flexibility have some problems with problem solving and planning. When these people come across a new situation, they adopt a strict viewpoint, and this plays a role in reinforcing schemas and beliefs (Young, Rygh, Weinberger and Beck, 2008). The presence of early maladaptive schemas that are built in the early years of life and affect the life thereafter can lead individuals to be inflexible cognitively. As a result, it can be stated that it is an expected finding that early maladaptive schemas predict cognitive flexibility in the reverse direction as maladaptive and harming schemas have a strict structure of thought, and can lead people to be inflexible in cognitive terms.

Structural equation modelling also indicates that cognitive flexibility predicts university students' level of rumination at a statistically significant level. Literature review shows that there is a relation between cognitive flexibility and rumination (Davis and Nolen-Hoeksema, 2000; Genet, Malooly and Siemer, 2013; Owens and Derakshan, 2013). Davis and Nolen-Hoeksema (2000) carried out a study in which they indicated that a low level of cognitive flexibility increases rumination. In another study, Genet, Malooly and Siemer (2013) concluded that being inflexible in cognitive terms is associated with having ruminative thoughts.

According to this, not being able to be flexible cognitively increases rumination and causes individuals not to be able to stay away from their problems (Davis and Nolen-Hoeksema, 2000). Rumination is also an indicator of cognitive inflexibility. Cognitive inflexibility refers to a tendency to rumination. Cognitive inflexibility causes people not to be able to distract their attention from themselves and their problems (Martin, Oren and Boone, 1991). This can direct individuals to ruminative thinking. Cognitive flexibility's sub dimensions of alternatives predict rumination's sub dimensions of reflection and brooding in the positive direction at a statistically significant level. The sub dimension of alternatives in the Cognitive Flexibility Inventory aims to measure individuals' level of perceiving that there might be alternatives of possible events and behaviours as well as problem-solving skills to cope with difficult situations (Dennis and Vander Wal, 2010). On the other hand, rumination's sub dimension of reflection consists of individuals' thought about the efforts to find what they can do in order to overcome problems or difficult situations, and it is associated with an introvert way of cognitive problem-solving. When people are in seek of an alternative way of solution and make mental effort to think over it continuously, this can enhance their tendency to think deeply and support brooding, which is a dimension of rumination. Moreover, when individuals turn towards alternatives of problems and cases all the time, this can lead to reflection and this in turn can enhance the tendency of brooding as people can easily get trapped in a passive cycle. On the other hand, cognitive flexibility's sub dimension of control predicts rumination's sub dimension of reflection and brooding in the negative direction at a statistically significant level. Cognitive flexibility's sub dimension of control intends to measure the perceptual tendency to control difficult situations (Dennis and Vander Wal, 2010). Individuals who perceive difficult situations as controllable have more positive and constructive cognitions and they tend to be motivated against difficult situations. Moreover, these individuals are likely to be more motivated via a more positive cognition instead of unconstructive and negative cognitions (e.g. worry, self-blaming in a ruminative way) (Dennis and Vander Wal, 2010). Individuals who cannot perceive difficult situations as controllable can have a higher level of reflection and brooding.

Nolen-Hoeksema and Jackson (2001) liken rumination to cognitive reappraisal, which is one of the strategies for emotion regulation. Individuals who have the strategy of re-appraisal try to produce an alternative viewpoint in case of a problem, whereas individuals who have rumination cannot display an effective function in the same case (Nolen-Hoeksema and Jackson, 2001). Rumination is also regarded as a dysfunctional strategy of emotion regulation. As rumination increases, people have more difficulty in expressing their emotions (Leahy, 2002). The results of the analyses show that brooding, which is a sub dimension of rumination, predicts expressive suppression, which is a sub dimension of emotion regulation, in the positive direction, while it predicts cognitive reappraisal in the negative direction at a statistically significant level. The study findings point out that individuals who have brooding have a lower level of cognitive reappraisal and a higher level of expressive suppression.

There are some studies in the literature that have similar findings to the current study regarding brooding and emotion regulation's sub dimensions of cognitive reappraisal as well as expressive suppression. In one of these studies, Daches and Mor (2015) indicate that there is a positive relationship between the tendency to cognitive reappraisal and prevention of negative thinking (content) in individuals who are less likely to display brooding. In other words, individuals who have a low level of brooding can do cognitive reappraisal and prevent their negative thoughts. Dieler, Herrmann and Fallgatter (2014) also state that brooding and anxiety can lead to expressive suppression.

Reflection, which is a sub dimension of rumination, positively predicts cognitive reappraisal, which is a sub dimension of emotion regulation at a statistically significant level, whereas it does not predict expressive suppression, another sub dimension of emotion regulation, at a statistically significant level. Treynor, Gonzalez and Nolen-Hoeksema (2003) express that reflection can create emotional disturbance in the short term, but it can also be accepted to be functional as it may lead people to successful problem-solving in the long run. Reflection includes one's thoughts to find what to do in order to overcome problems and difficulties. Individuals can look for alternative solutions for their problems and evaluate their situation again and again, making cognitive reappraisal. Because of that, it seems possible to state that individuals who have reflection can increase their level of cognitive reappraisal.

CONCLUSION AND RECOMMENDATIONS

Within the scope of the current study, the relations between emotion regulation and early maladaptive schemas, cognitive flexibility and rumination were analyzed via structural equation modelling analysis. According to the study results, early maladaptive schemas predict the sub dimensions of cognitive flexibility; sub dimensions of cognitive flexibility predict the sub dimensions of rumination; rumination's sub-dimension of brooding predicts cognitive reappraisal and expressive suppression, which are both sub dimensions of emotion regulation; reflection, a sub dimension of rumination, predicts cognitive reappraisal, but does not predict expressive suppression. Lastly, early maladaptive schemas stem from negative parental attitudes and dysfunctional in-family patterns that are established at early ages in life. When early maladaptive schemas are activated, individuals' level of cognitive flexibility decreases. Therefore, individuals' ruminative thoughts increase and an increase in ruminative thoughts cause people not to be able to regulate their emotions.

As is stated before within the framework of the current study, both early maladaptive schemas and emotion regulation skills stand upon early periods of childhood. Therefore, longitudinal studies can be conducted on the development of early maladaptive schemas and emotion regulation skills over the years starting from childhood period. The findings of the current study regarding the effect of cognitive flexibility and rumination on the relation between early maladaptive schemas and emotion regulation can be supported with further studies, while the role of various other variables can be examined in the relation between the two

variables. Practitioners in the field can provide parents with training on sensitive parenting in order to help them develop functional and healthy emotion regulation strategies in their children. For instance, there are some joint projects conducted by ministries for the purpose of developing effective parental attitudes. Directorate General for Lifelong Learning of the Ministry of National Education (MEB HBÖGM) implements a program in order to develop parental skills and attitudes of people having children between the ages of 0-18 with a Parenting Education Program (MEB HBÖGM, 2018). Within this framework, there are sessions on developing emotion regulation skills of children. Starting from this point, practitioners in the field can provide parents and students with support via similar programs.

According to another finding of the current study, early maladaptive schemas predict the level of cognitive flexibility. In this context, individuals' level of cognitive flexibility can be increased through intervention programs that define activated schema domains and decrease their impact. Preventive guidance and psychological counselling services can be conducted at school in order to help students to gain problem-solving skills and regulate their emotions at an early age, especially focusing on students who have a tendency to ruminative thinking. Group counselling and group guidance services can be rendered at school to ensure individuals to have a high level of cognitive flexibility, use effective emotion regulation strategies, and overcome ruminative thinking. University students can be supported to accept their emotions, make use of appropriate strategies to regulate their emotions, become aware of the issue of emotion regulation and overcome possible problems by means of psychological counselling and guidance units of universities, and psycho-education programs can be organized in this respect to improve students' skills of emotion regulation.

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Statements of publication ethics

We hereby declare that the study has not unethical issues and that research and publication ethics have been observed carefully.

Researchers' contribution rate

The study was conducted and reported with equal collaboration of the researchers. This study is based on the first author's master thesis (mentored by the second author) presented to Ankara University.

Ethics Committee Approval Information

The study was approved by Ankara University Ethics Committee (26/09/2016-268/20).

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