Sleep Hypn 2017;19(2):38-53
http://dx.doi.org/10.5350/Sleep.Hypn.2016.18.0119

Sleep and Hypnosis
A Journal of Clinical Neuroscience and Psychopathology

ORIGINAL ARTICLE

A Psychometric Investigation of the Turkish Version of the Children's Response Style Scale (CRSS) Using Structural Mediational Analysis Approach

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ABSTRACT
The study investigated the psychometric properties of the Turkish version of the Children's Response Style Scale (CRSS). Participants were 1358 students, aged 13 - 19, and about half of the sample consisted of girls (N= 640, 47.13%). Confirmatory factor analysis was conducted and the original two-factor structure of the CRSS was replicated among the Turkish sample. It was demonstrated that sub-scales of the Turkish version have good internal reliability, test-retest reliability and convergent validity. Rumination, meta-cognitions, pathological worry, and thought suppression were found to be significant antecedents of depressive symptomatology in adolescents. Consistent with the conceptualization of the response styles theory, distraction was preventive from depressive symptoms. A structural equation model specified based on an integration of the response styles theory (Nolen-Hoeksema, 1991) and the Self-Regulatory Executive Function (S-REF) model of emotional disorders (Wells, 2000; Wells & Matthews, 1996) detected that significant linkages between depression and metacognitions were mediated by thought suppression, rumination and worry among adolescents. Gender differences on measures of cognitive vulnerability factors were substantial that girls revealed a greater tendency to meta-cognitive vulnerability, thought suppression, rumination and pathological worry, while boys scored higher on distraction. Gender differences in depressive symptomatology fell short of significance when controlling for cognitive vulnerability factors. Age was not a significant antecedent of cognitive vulnerability factors and depressive symptoms. The results are discussed in light of theoretical and empirical evidence in the literature.
Keywords: Juvenile depression, assessment, rumination, distraction, metacognitions, worry, thought suppression, gender, adolescence

INTRODUCTION

In the face of stressful situations, people may respond to their mood states in several ways: denying or suppressing thinking about how they feel, taking action to be instrumental in changing the circumstances faced with, or ruminating. Nolen-Hoeksema (1991) conceptualized the rumination as repetitive and passive thinking about one's inner negative mood states, the possible causes and consequences of the distress.

Even though every individual may engage in some rumination, some ruminate extensively when depressed or sad and these trait differences are likely to be stable over time (Nolen-Hoeksema & Davis, 1999). According to the rumination theory, depressive symptomatology

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may become chronic and evolve into a major depressive episode moderated through ruminative thinking style (Nolen-Hoeksema, 2004). Accumulated evidence, even though heavily relying on correlational studies, lent support for that rumination not only exacerbates symptomatic manifestations in response to stressful situations but also makes the situation more entangled through hindering internal motivation for taking into action. At the other end, distraction represents an adaptive alternative that helps divert attention away to pleasant or neutral thoughts and behaviors to elevate one's negative emotional states and lift one's mood (Nolen-Hoeksema, 1991)

Many of the contentions of the response styles theory have been well-supported among adult samples. The garnered evidence suggested that the way in which people respond to their depressive symptomatology determines the severity and duration of the disorder. (Lyubomirsky & Tkach, 2004; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Nevertheless, the prevalence of depression is not rare among children and adolescents. Longitudinal studies of depressive disorders in children and adolescents suggest an average age of first onset between 11 and 14 years (Kovacs, Feinberg, Crousenovak, Paulauskas, & Finkelstein, 1984; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Cohort studies following the same participants over time indicate a peak in the prevalence of the major depression after age 11 and again after age 15 years (Kim-Cohen et al., 2003; Mcgee et al., 1990; Newman et al., 1996). Depression in children and adolescents is at an unprecedented rate that 9% of youth have experiences at least one episode by the age of 14 (Lewinsohn et al., 1993), and lifetime prevalence rates for major depression between the ages of 15 and 18 are estimated to be approximately 14% (Hammen & Rudolph, 2003). Early-onset depression is chronic in nature with 84% of those depressed as youth experience at least one depressive episode in the adulthood (Harrington, Rutter, & Fombonne, 1996). Therefore, given the morbidity of depressive disorders in youth populations, assessment of response style theory with respect to the etiology of depression which is one the most prominent cognitive vulnerability approaches seems to be crucial among children and adolescents.

The substantial connections between ruminative response style and depressive symptomatology have consistently been found across different youth populations examined by prospective studies characterized by a more robust research design in comparison to cross-sectional studies. A multi-vawe study investigating the transition from early to late adolescence observed that a greater proneness to rumination was associated with a greater likelihood of reporting a past history of major depression as well as experiencing the onset of a future major depressive episode with greater duration. Supporting the stress-diathesis perspective for depressive vulnerability hypothesis, ruminative response style substantially interacted with negative life events in predicting future depressive episodes (Abela & Hankin, 2011). In the response style theory view, the associations between negative life events and depressive symptomatology vary as a function of sex (Nolen-Hoeksema & Girgus, 1994). Contrarily, majority of the prospective studies using children and adolescent samples were not supportive for the hypothesis of that significant interactions between vulnerability factors and depressive symptoms are as a function of sex over time and girls exhibit greater rumination than boys; however, evidence was mixed (Abela, Aydin, & Auerbach, 2007; Abela, Brozina, & Haigh, 2002; Abela, Vanderbilt, & Rochon, 2004; Broderick & Korteland, 2004).The studies using middle to late adolescent samples were more likely to observe expected hypothesized sex differences (Abela, Parkinson, Stolow, & Starrs, 2009; Schwartz & Koenig, 1996).

Pathological worry is defined as a cascade of negatively affect-laden thoughts and images which are excessive, relatively uncontrollable and distressing in nature (Borkovec, Robinson, Pruzinsky, & DePree, 1983). Co-occurrence of pathological worry with rumination has much in common that strong correlations between these two unproductive repetitive thinking about self-relevant topics was reported in clinical and non-clinical samples (Segerstrom, Tsao, Alden, & Craske, 2000). These two constructs may overlap at least to some

degree, however, pathological worry and rumination originate in separate theoretical considerations that the content of worry typically is applied to thoughts of possible future treats and conceptually tied to anxiety, whereas rumination refers to repetitive thinking about past negative events and conceptually tied to depression (Papageorgiou & Wells, 1999; E. Watkins, Moulds, & Mackintosh, 2005).

From a meta-cognitive perspective, Self-Regulatory Executive Function model of affective dysregulation places emphasis on the role of meta-cognitive beliefs and coping processes in initiating ruminative thought for maintaining adaptive self-knowledge as a generic dysfunctional cognitive process common to a variety of emotional disorders rather than specific to depression (Matthews & Wells, 2004; Wells & Matthews, 1996). According to the model, when a discrepancy between perceived and expected self knowledge occurs, a specific thought pattern of Cognitive Attentional Syndrome (CAS) is set in motion that is central to the onset and maintenance of negative emotions. People more prone to rumination easily immerse into repetitive thoughts due to the focus of their attention on symptoms or consequences, and CAS includes rumination, worry, self-focused attention and attentional bias that hinder coping actively and sustain depressive symptomatology in the face of stressful situations (Wells, 2000). According to the model, rumination emerges from person's meta-cognitive beliefs that guide the use of repetitive thinking as a strategy for self-regulation. Positive metacognitive beliefs concerns the usefulness of rumination in improving emotional well-being and negative metacognitive beliefs concerns the uncontrolliability and negative consequences of critical rumination (Papageorgiou & Wells, 2001a, 2001b).

A more recent study conducted in community and clinical samples of major depressive disorder, panic disorder and social anxiety disorder attested the contentions of the meta-cognitive theory of emotional disorders that meta-cognitive beliefs had strong linkages to rumination, pathological worry, as well as anxiety and depression (Yilmaz, Sungur, Konkan, & Senormanci, 2015). More specifically, using a structural modeling approach, positive metacognitive beliefs were demonstrated to be significantly contributing to rumination which statistically significantly contributed to elevation of depressive symptoms via negative metacognitive beliefs in clinical and nonclinical samples (Papageorgiou & Wells, 2003). In keeping with theoretical considerations and empirical findings regarding the role of metacognitive beliefs in relation to rumination and depression, Papageorgiou and Wells (2009) provided further support and extended the evidence in a clinical sample that negative beliefs about rumination were prospectively predictive of depressive symptomatology after controlling for baseline levels of depression and rumination but rumination was not after controlling for meta-cognitions. Therefore, we computed Pearson correlations between the CRSS subscales, metacognition, thought suppression, pathological worry, and depressive symptoms to assess criterion validity and run a multiple regression analysis.

Excessive worry was not rare among adolescents and similar mechanisms observed among adults seem to serve exacerbation of worry of adolescents that using cognitive avoidance strategies were significant determinants of adolescent worry along with metacognitive beliefs (Fialko, Bolton, & Perrin, 2012; Gosselin et al., 2007; Laugesen, Dugas, & Bukowski, 2003). In comparison to healthy controls, children with generalized anxiety disorder reported greater levels of dysfunctional metacognive beliefs and cognitive avoidance (Donovan, Holmes, & Farrell, 2016). Metacognitive beliefs statistically significantly contributed to significant relations between obsessionality and worry as a thought control strategy among adolescents, aged 13-16 (Wilson & Hall, 2012). Even though the number of studies is scarce, preliminary evidence lent support for the premise that overuse of thought suppression strategies may play part in development and maintenance of excessive and uncontrollable worry from early ages to adulthood (Kertz & Woodruff-Borden, 2011). Additionally, it was supposed in here that metacognitive beliefs underlie in both maladaptive repetitive thought and thought control strategies that cause initiation and maintenance of

depressive symptoms. Therefore, we tested a meditational structural equation model in which the relations between depression and metacognitions were mediated by response styles, as well as worry and thought suppression.

Until recent years, a vast array of research examining the etiology, treatment and prevention of depression has been disproportionately conducted using adult samples. However, in comparison to late onset depression, expression of depressive symptomatology has only a few modest differences in early onset depression (Hegeman, Kok, van der Mast, & Giltay, 2012). Even subsyndromal depressive symptomatology was demonstrated to be indicative of severe impairment in functioning and may lead to the later development of psychopathology (Roberts, Lewinsohn, & Seeley, 1991). Given the chronicity of early-onset depression, models of depression are needed a downward extension to children and adolescents. Therefore, development of screening tools to assess juvenile depression and risk factors for early-onset depressive symptomatology such as ruminative style is of monumental importance to fine-tune the prevention strategies and treatment approaches of the disorder. The primary aim of this study was to investigate the psychometric properties of the Turkish version of the Children's Response Style Scale (CRSS). Using a confirmatory factor analytic procedure, we tested whether the original two-factor structure of the CRSS fit to the current data. We assessed the associations between response style, depressive symptoms, pathological worry, thought suppression, and meta-cognitions in a way aforementioned above to investigate the convergent validity of the CRSS.

METHOD

Participants and Procedure

At the outset, the questionnaire packages were distributed to approximately 1500 respondents and 1358 subjects volunteered to participate in the study. The mean age of the sample was 15.52 (SD±1.23) and 52.87 of the respondents were boys (n=718). Of the sample, 4.43% of the participants (n=59) were from low income families, 43.21% were from middle (n=576) and 52.36% were from high income families (n=698). 25 subjects did not respond to this question.

The CRSS was translated from English to Turkish by three academicians fluent in English. Two experts commented on the translated form of the CRSS in terms of content appropriateness and cultural correspondence. Based on the feedbacks, authors worked on and finalized the Turkish version with some changes on wording. The applicability of the Turkish version was initially tested among 100 high school students. Then, overall sample was recruited from public schools located in the central districts of Van, Turkey. Families of the participants were briefly informed about procedure and content of this study and provided written informed consent.

Measures

Children's Response Style Scale (CRSS). The CRSS is a 20-item screening tool designed by Ziegert and Kistner (2002) to assess response styles in children and adolescents. Respondents are asked to rate each question on a scale ranging from 0 ("never") to 10 ("always"). The scale yields two measures of orthogonal psychological constructs each of which consists of ten items: *Rumination* and *Distraction*. English version of the scale was demonstrated to have good internal reliability in the initial validation study that the Cronbach's alpha coefficients were αs= 0.81 and 0.88, respectively.

Center for Epidemiological Studies Depression Scale (CES-D). The CES-D is a 20-item self-report screening tool developed by American National Mental Health Institute to assess severity of depressive symptoms (Radloff, 1977; Sheehan, Fifield, Reisine, & Tennen, 1995). Participants are asked to rate each item on a measure ranging from 0 ("rarely or none of the time") to 3 ("all of the time"). 4., 8., 12. and 16. items are reverse coded and the scale yields total scores, ranging from 0 to 60. The Turkish version of the CES-D had good reliability and validity in either adult (Tatar & Saltukoglu, 2010) or youth community samples with an internal consistency of α= 0.74 among youths (Tatar, Kayiran, Saltukoglu, Ozkut, & Emeksiz, 2013).

White Bear Suppression Inventory (WBSI). The WBSI was developed by Wegner and Zanakos (1994) to assess a tendency to cognitive suppression. The scale consists of 15 self-report items rated on a five-point scale from 1 to 5. Altin and Gencoz (2009) reported good validity and excellent reliability with a Cronbach's alfa coefficient of α=0.90 and test retest correlation of r=0.80.

Penn State Worry Questionnaire (PSWQ). The PSWQ is a 16-item self report questionnaire designed to measure generalized, excessive and uncontrollable pathological worry (Meyer, Miller, Metzger, & Borkovec, 1990). Items are rated on a five-point measure and the screening tool yields a total score ranging from 16 to 80. Boysan, Keskin, and Besiroglu (2008) reported good reliability and validity for the Turkish version, with a Cronbach's alpha of α=0.77.

Meta-Cognitions Questionnaire for Children (MCQ-C). The MSQ-C is a self-report measure of meta-cognitive appraisals in children and adolescents consisting of 24 items rated on a four-point Likert type scale (Bacow, Pincus, Ehrenreich, & Brody, 2009). The measure yields four subscales each consists of six items: (1) Positive beliefs about worry (positive meta-worry), (2) negative beliefs about worry (negative meta-worry), (3) superstitious, punishment and responsibility beliefs, and (4) cognitive monitoring (awareness of one's own thoughts). Turkish form was reported to have good validity and reliability with a Cronbach's alpha of α= .73 (Irak, 2012).

RESULTS

We begin investigating factor structure of the Turkish version of the CRSS. Then descriptive statistics were computed. Convergent validity of the CRSS sub-scales was evaluated through running Pearson product-moment correlation coefficients.

Confirmatory Factor Analyses for the CRSS

To investigate whether the latent factor structure of the CRSS fit to the current data, Satorra-Bentler corrected maximum likelihood CFAs were carried out. MPlus 4.01 was used to perform all analyses (Muthén & Muthén, 2006). The model fit to the data was assessed using several indices proposed by Hu and Bentler (1999): root mean square error of approximation (RMSEA); comparative fit index (CFI); and standardized root mean square of residuals (SRMR). The expected criteria for model goodness of fit are as follows: RMSEA < 0.08; CFI ≥ 0.90; and SRMR < 0.08. Bayesian Information Criterion (BIC) is utilized to make comparisons across models that the lower the BIC value the better the model fit (Schwarz, 1978).

Using CFAs, three alternative models representing the latent factor structure of the CRSS were tested to examine whether response styles could be best conceptualized as a unique factor or two independent factors relying on the data, including 1358 respondents. To avoid biased estimates due to the non-normality during the parameter estimation process, we adhered to robust maximum likelihood estimation procedures in each model.

Table 1. Model fit indices for alternative measurement models

Model	S-B χ^2 (df)	RMSEA	CFI	SRMR	BIC
2CORFAC (items 4 and 7; items 1 and 11; items 9 and 12)	830.777**(166)	0.055	0.90	0.067	135314.864
2CORFAC (items 4 and 7; items 1 and 11)	868.086**(167)	0.056	0.89	0.067	135352.327
2CORFAC (items 4 and 7)	932.611**(168)	0.059	0.88	0.068	135422.324
2CORFAC	1018.148**(169)	0.062	0.87	0.069	135517.454
1FAC	2381.629**(170)	0.099	0.65	0.117	137136.271

*Note. **: p < .01;* S-B χ^2 = Satorra–Bentler scaled chi square value; RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR= standardized root mean square of residuals; BIC = Bayesian Information Criterion

We run scaled difference chi-square test (Bryant & Satorra, 2012) to determine whether response styles in terms of rumination and distraction are best represented as two correlated factors or a unidimentional model. As the fit indices are presented in Table 1, the two-correlated-factor model had significantly lower scaled chi-square than unidimentional model ($p<0.01$). Nevertheless, the model fit indices generated by robust maximum likelihood method for the original two-factor structure fell short of statistically acceptable ranges. Modification indices suggested three additional covariance parameters between items 4 and 7, 1 and 11, and items 9 and 12. Adding these parameters, we run the CFAs sequentially that each parameter resulted in significant improvement in model fit and the model fit indices came within the acceptable range. The correlation between two latent factors was r= -0.09 ($p<.01$). Standardized maximum likelihood estimates and R^2s are presented in Table 2.

Descriptive and item statistics

Table 3 represents descriptive statistics for the psychometric measures and item statistics. Generally, high corrected item-total correlation coefficients were obtained for the CRSS items that all items had item discrimination index values higher than 0.28, with an exception of item 3 "I think about something I did a little while ago that was a lot of fun." which revealed relatively

Table 2. Maximum likelihood factor loadings and R^2s for the CRSS

	Factors	Factor Loading	R^2
CRSS 1	Rumination	0.435	0.189
CRSS 2	Rumination	0.400	0.160
CRSS 3	Distraction	0.182	0.033
CRSS 4	Rumination	0.463	0.214
CRSS 5	Distraction	0.696	0.485
CRSS 6	Distraction	0.491	0.241
CRSS 7	Rumination	0.447	0.200
CRSS 8	Rumination	0.527	0.278
CRSS 9	Distraction	0.696	0.485
CRSS 10	Distraction	0.735	0.540
CRSS 11	Rumination	0.440	0.194
CRSS 12	Distraction	0.728	0.530
CRSS 13	Rumination	0.573	0.329
CRSS 14	Distraction	0.761	0.580
CRSS 15	Distraction	0.740	0.548
CRSS 16	Rumination	0.522	0.273
CRSS 17	Distraction	0.602	0.363
CRSS 18	Distraction	0.636	0.404
CRSS 19	Rumination	0.622	0.387
CRSS 20	Rumination	0.351	0.123

Note. Overall, 32.78% of the total variance was explained by two factors.; CRSS = Children's Response Style Scale

Table 3. Descriptive statistics for the psychometric measures

	N	α	Rjt	Inter-item r	M	SD	M range (items)	SD range (items)
Children's Response Style Scale								
Rumination	1337	0.76	0.28-0.52	0.07-0.44	60.50	19.37	4.69-7.24	2.97-3.78
Distraction	1338	0.86	0.17-0.70	0.04-0.64	47.52	23.69	4.01-5.50	3.45-3.81
Center for Epidemiological Studies Depression Scale	1209	0.89	0.06-0.71	-0.16-0.57	24.25	12.32	0.58-2.24	0.98-1.16
Meta-Cognitions Questionnaire for Children	1222	0.82	0.12-0.52	-0.17-0.52	58.39	11.22	1.79-3.07	0.95-1.16
Penn State Worry Questionnaire	1209	0.87	0.13-0.70	-0.01-0.66	46.99	12.30	2.22-4.03	1.24-1.46
White Bear Suppression Inventory	1318	0.87	0.30-0.63	0.10-0.52	50.43	12.00	1.24-1.48	2.97-3.63

Note. N= valid observations; α= internal consistency; Rjt= corrected item-total correlations (range); inter-item r= Spearman inter-item correlations (range); M= mean; SD= standard deviation; M range (items)= item means (range); SD range (items)= item standard deviations (range).

poor item-total correlation (r= 0.17). Rumination and Distraction sub-scales of the CRSS revealed good internal consistency (α= 0.76 and α= 0.86, respectively), and good temporal stability between two applications with two-week interval in terms of intra-correlations (r= 0.78 *p<0.01* and r= 0.63 *p<0.01*, respectively).

Convergent validity of the CRSS

We examined convergent validity of the CRSS by computing Pearson product-moments correlation coefficients with measures of depression, meta-cognitions, thought suppression and pathological worry. Respondents who were more prone to ruminative thinking scored greater scores of the CES-D (r=0.33 *p<.01*), meta-cognitions (r=0.39 *p<.01*); thought suppression (r=0.33 *p<.01*) and pathological worry (r=0.35 *p<.01*). In contrast, Distraction scale was inversely associated with depression (r= -0.26 *p<.01*); pathological worry (r = -0.17 *p<.01*) and meta-cognitions (r= -0.07 *p<.05*). The connection between distraction and thought suppression was not significant (r= -0.04 *p>.05*).

Multivariate analysis of scale scores according to grade level and gender

Table 4 represents the multivariate analysis of variance (MANOVA) of the response styles measured by the CRSS and depressive symptoms according to grade level and sex. Using Wilks' Lambda, results of MANOVA analysis indicated an unsubstantial interaction effect for Gender x Grade level (Wilks' Lambda = 0.992; F(9, 3146.973) = 1.208, *p = 0.285* η^2 = 0.003) and an unsubstantial main effect for Grade level (Wilks' Lambda = 0.994; F(9, 3146.973) = 0.872, *p=0.550* η^2 = 0.002). On the other hand, gender had a significant multivariate main effect: (Wilks' Lambda = 0.957; F(3, 1293) = 19,513, *p <0.001* η^2 = 0,043). Irrespective of grade level, adolescents girls were more prone to ruminate (F(1,1295) = 47.136; *p < .001* η^2 = 0.035) and less likely to distract (F(1,1295) = 12.267; *p < .001* η^2 = 0.009) than adolescent boys. Furthermore, girls reported greater scores on the CES-D compared to boys F(1,1295) =11.054 *p < .01* η^2 = 0.01.

Table 4. Multivariate analysis of variance of response styles and depressive symptoms according to grade levels and gender

		Grade 9 (n=487)			Grade10 (n=347)			Grade 11 (n=375)			Grade 12 (n=149)			Gender			Grade			Gender			Grade x Gender		
		N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	F(3,1295)	P	η^2	F(1,1295)	P	η^2	F(3,1295)	P	η^2
Rumination	Boys	229	54.67	19.67	175	58.10	21.37	200	56.41	18.14	88	57.68	17.31	718	56.55	19.34	1.144	.330	.003	47.136	<.001	.035	2.007	.111	.005
	Girls	238	64.28	20.04	169	62.54	16.70	144	67.45	17.31	60	64.62	20.26	640	64.93	18.44									
Distraction	Boys	229	50.41	22.90	175	52.06	22.90	200	47.41	23.43	88	47.07	21.93	718	49.81	22.98	0.992	.396	.002	12.267	<.001	.009	1.237	.295	.003
	Girls	238	45.82	24.80	169	43.28	24.39	144	45.56	24.38	60	41.97	23.29	640	44.95	24.23									
Depression	Boys	229	22.16	11.76	175	23.48	11.42	200	23.62	11.33	88	23.98	10.88	718	23.16	11.42	1.081	.356	.002	11.054	.001	.008	0.283	.838	.001
	Girls	238	25.13	13.59	169	25.38	12.97	144	25.38	13.04	60	27.38	12.61	640	25.47	13.17									

Regression analysis

To investigate the predictive values of cognitive risk factors in terms of response styles, meta-cognitions, pathological worry and thought suppression on depressive symptomatology among youths, we run a multiple regression analysis. The regression model had a significant F value (F(7, 1248) = 79.196 *p<0.01*) and predictor variables explained 30% of the total variance in depressive symptoms. In the regression model, partial effect of gender fell short of significance and age was not a significant predictor of depressive symptomatology. Rumination (β=0.16 t=6.158 *p<0.001*), meta-cognitions (β = 0.08 t=2.546 *p<0.05*), pathological worry (β = 0.32 t=10.836 *p<0.001*) and thought suppression (β = 0.060 t=2.113 *p <0.05*) significantly contributed to severity of depressive symptoms and distraction was inversely associated with depression (β =-0.20 t= -8.240 *p<0.001*). Collinearity diagnostics in terms of tolerance and variance inflation factor displayed that the addressed variables were structurally distinct constructs (O'Brien, 2007).

Mediational structural path model

Although multiple regression analysis demonstrated that response styles, meta-cognitions, pathological worry and thought suppression were all statistically significant correlates of depressive symptoms, we examined the clinical metacognitive model of repetitive thoughts and depression through a mediational structural path model in the current cross-sectional non-clinical youth data. The S-REF model of emotional dysregulation (e.g.; Wells, 2000; Wells & Matthews, 1996) suggests that metacognitions lead to use of repetitive thinking such as ruminative and worrisome thinking in coping with stressful situations. On the other hand, overuse of repetitive thoughts is thought to set in motion of secondary negative metacognitive beliefs about repetitive thoughts resulting in elevation of depression. In the current model, we specified all types of metacognitive beliefs as the antecedent of depressive symptoms mediated by repetitive thoughts such as rumination and worry among adolescents. Distraction was admittedly expected to inversely contribute to the

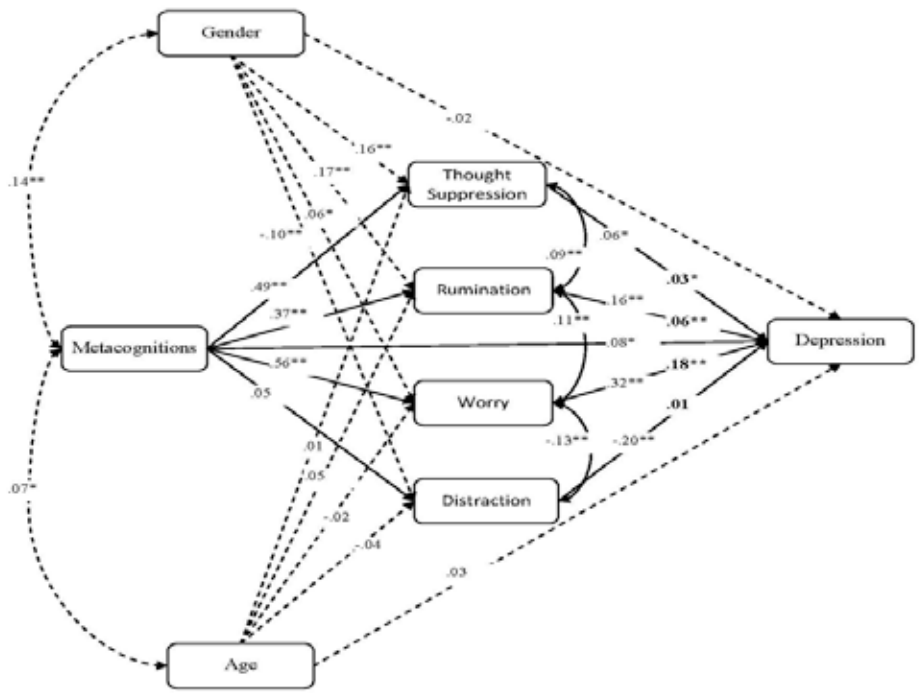

Figure 1: Mediational path model of structural relations between metacognitive beliefs and depression after controlling for gender and age. Indirect effects of metacognitive beliefs through response styles, worry, and thought suppression on depression are boldfaced (*:p<0.05; **:p<0.01).

relation between metacognitive beliefs and depression. Therefore once rumination and worry are activated, adolescents who appraise this process as unwanted and harmful would try to suppress the unproductive cognitive process that, in turn, is likely to produce exacerbation of ruminative and worrisome thinking contributing to depressive symptomatology.

As can be seen in Figure 1, we specified a baseline meditational path model in which response styles, pathological worry and thought suppression were contributed to the association between metacognitive beliefs and depression. In the model, age and gender controlled according the meditational analysis model suggested by Preacher and Hayes (2008). Modification indices suggested three additional covariances between: worry and rumination, worry and distraction, and thought suppression and rumination. Regarding these three additional parameters, each caused a statistically significant improvement in S-B Scaled χ^2 value of the model (Bryant & Satorra, 2012). The meditational structural model yielded an excellent fit to the data according to the guidelines (Hu & Bentler, 1999): a S-B Scaled χ^2 (3) was 15.709 *p=0.001,* comparative fit index was 0.99, Tucker-Lewis index was 0.94, root mean square error of approximation was 0.058, and standardized root mean square residual was 0.013.

In the model, girls had greater levels of metacognitive beliefs, thought suppression, rumination and worry compared to boys; while boys were more prone to distractive thinking. Despite statistically significant direct effects of cognitive vulnerability factors, metacognitive beliefs exerted indirectly through exacerbation of thought suppression (β=0.03 $p<0.05$), rumination (β=0.06 $p<0.05$), and worry (β=0.18 $p<0.01$) on depressive symptoms. Worry was significant correlate of both rumination and distraction ($p<0.01$). Association between rumination and thought suppression was significant as well ($p<0.01$).

DISCUSSION

In the present study, we investigated psychometric properties of the Turkish version of the Children's Response Style Scale (CRSS). Using CFAs, we replicated the original two-factor structure proposed in the initial validation study (Ziegert & Kistner, 2002). The Turkish version revealed good internal consistency and test re-test stability. Significant associations of both rumination and distraction sub-scales with depression were found. Partial contributions of response styles to depressive symptomatology were also substantial after adjusting for age, gender, meta-cognitions, pathological worry and thought suppression. Metacognitions, pathological worry and thought suppression were significant predictors of severity of depression symptoms in youths as well. Consistent with the metacognitive theory of depression, mediational structural path model displayed that associations between metacognitions and depressive symptoms were mediated by thought suppression, rumination and worry.

Adolescence is a critical period for understanding the epidemiology of depression that the majority of individuals who develop this disorder experience their first episode during the transition from middle to late adolescence or early adulthood. Marked gender difference has been widely recognized for depression (American Psychiatric Association, 2013). Prospective studies of youth depression from the perspective of response style theory have consistently evidenced strong support for that greater levels of ruminative thinking was indicative of greater increases in depressive symptoms over time (Abela et al., 2007; Abela et al., 2002; Abela et al., 2009; Burwell & Shirk, 2007; Hankin, 2008; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Schwartz & Koenig, 1996). Most of these studies used the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991) to assess individual differences in tendency to ruminate in adult studies (Nolen-Hoeksema et al., 2008). In an attempt to provide a downward extension of assessment of response style theory in children and adolescents, the Children's Response Style Scale was designed by Ziegert and Kistner (2002) to assess tendency to reflect on their symptomatology among youth populations. However, to date, psychometric properties of the CRSS have received little interest. Children's Response Style Questionnaire (CRSQ)

developed by Abela, Rochon, and Vanderbilt (2000) to assess similar content is one of the most widely used screening tools of response styles in children and adolescents. The questionnaire yields three factors of Rumination, Distraction, and Problem Solving. However, two-factor structure outperformed originally proposed three factors in the psychometric investigation the Turkish version of the CRSQ (Özgülük, Erdur Baker, & Bugay, 2012), as well as a subsequent factor analytic study of the English version (Abela et al., 2007). In consonant with response style literature heavily relying on the definition of the construct by Nolen-Hoeksema (1991), we replicated the original two-factor structure of the CRSS in a representative large adolescent sample : rumination and distraction.

Gender differences in response styles, one of the key components of Nolen-Hoeksema and Girgus's (1994) model, was suggested to be developing prior to adolescence and a crucial antecedent of sex differences in adolescent depression. It has been well-documented that women are more prone to ruminating than men in adult studies of response styles (Butler & Nolenhoeksema, 1994; Nolan, Roberts, & Gotlib, 1998; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolenhoeksema, Morrow, & Fredrickson, 1993). Studies provided evidence for that men had greater scores on distraction than women as well (Butler & Nolenhoeksema, 1994; Conway, Giannopoulos, & Stiefenhofer, 1990; Nolenhoeksema et al., 1993). Consistent with the previous findings, girls had greater scores on rumination and depression irrespective of grade level than boys, whilst boys reported a greater tendency to distraction compared to girls. Moreover, girls revealed a greater tendency to meta-cognitive vulnerability, thought suppression and pathological worry. Substantial evidence points to that a preponderance of women reveal greater levels of cognitive vulnerability to difficulties in emotional regulation (McLean & Anderson, 2009; Nolen-Hoeksema, 2012). These findings also provided empirical support for the literature that girls were at higher risk for engaging in worrisome thoughts (Barahmand, 2008; Robichaud, Dugas, & Conway, 2003; Silverman, Lagreca, & Wasserstein, 1995). Research has consistently continued to report that women score higher on measures of rumination than men (Cox, Mezulis, & Hyde, 2010; Hampel & Petermann, 2005; Jose & Brown, 2008; Lopez, Driscoll, & Kistner, 2009; Peled & Moretti, 2007). Nevertheless, when controlled for cognitive vulnerability factors, gender differences in depressive symptomatology fell short of statistical significance in the meditational meta-cognitive model of depression.

Despite both of rumination and excessive worry refer to counterproductive cognitive processes in relation to emotional problems and seem to very share common aspects (E. R. Watkins, 2008), these conceptualizations of repetitive thoughts were demonstrated to be distinct psychological constructs (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Goring & Papageorgiou, 2008; Muris, Roelofs, Meesters, & Boomsma, 2004). Some lines of research have demonstrated that worry and rumination had unique associations with anxiety and depression (Hong, 2007; Muris et al., 2004), whereas others have demonstrated equally strong relationships to both anxiety and depression (Fresco et al., 2002; Muris, Roelofs, Rassin, Franken, & Mayer, 2005). In a prospective study of these relations among nonclinical undergraduates, Calmes and Roberts (2007) found strong associations of both rumination and worry with anxiety but the linkages were not substantial for depression. Firmness of associations between rumination and negative affect seem to come into null in longitudinal design research, a point suggested by Kirkegaard Thomsen (2006) in a systematic review of clinical studies. In contrast to proposed differential relations of worry and rumination with anxiety and depression (Papageorgiou & Wells, 1999; E. Watkins et al., 2005), we demonstrated that both worry and rumination significantly contributed to depression among adolescents. Additionally, worry seems to play a significant role in response styles that worrisome thoughts were observed to be co-occurring with rumination. Tentatively the most interesting was the significant inverse connections between distraction and worry that the construct of excessive and uncontrollable worry seems to be integral to adolescent response styles indeed. Distraction can be utilized in attenuation of

pathological worry. Yet, positive and negative psychological processes in self-regulation seem to be orthogonal rather than simple opposites (Boysan & Kiral, 2016) and distraction has been observed to be helpful among individuals vulnerable to rumination but not among people reporting a tendency of less ruminative thinking (Nolen-Hoeksema et al., 2008).

Theory of ironic mental control process holds that two parallel monitoring processes in the face of adversity, one conscious intentional effortful search for mental contents and the other unconscious automatic search, represent cognitive efforts to gain mental control, and, in turn, precipitate the undesired mental states (Wegner, 1997). Emotional disturbances due to negative thoughts such as rumination could trigger unproductive cognitive coping mechanisms that people suffering from depression can more likely make attempts towards suppressing repetitive thoughts and thus paradoxically exacerbate unproductive thinking styles and depressed mood (Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002; Wenzlaff, 2004; Wenzlaff & Bates, 1998; Wenzlaff & Luxton, 2003). A widely recognized account for negative ramifications of this maladaptive cognitive coping process is that attempts to suppress a thought can paradoxically result in an increase in the frequency of the suppressed thoughts (Wegner, Schneider, Carter, & White, 1987), longevity of attentional focus (Wegner & Erber, 1992; Wegner & Schneider, 1989) and intensity of psychophysiological responses (Wegner, Shortt, Blake, & Page, 1990), while the rebound effect of thought suppression seem to vary depending on the target thoughts (Abramowitz, Tolin, & Street, 2001). In a clinical adult inpatients group, Szasz (2009) demonstrated that the substantial linkage between depressive rumination and depression was mediated by thought suppression.

Significant connections between metacognitions, ruminative thinking and depressive symptomatology in various populations have been well-documented (Bennett & Wells, 2010; Kolubinski, Nikcevic, Lawrence, & Spada, 2016; Moulds, Yap, Kerr, Williams, & Kandris, 2010; Papageorgiou & Wells, 2003, 2009; Wong & Moulds, 2010). These investigations have been disproportionately conducted among adult samples. Additionally, meta-cognitive theory of emotional disorders placed importance on the cognitive attentional syndrome that constitutes a wide range of cognitive risk factors such as on-line processing of negative self-knowledge, using worry/rumination-based strategies, monitoring for threat, resource limitations and maladaptive coping (Wells, 2000). However, the potential relations between and roles of pathological worry, thought suppression and rumination in accounting for the relations between depression and metacognitions have not been modeled, specifically among youths. The current investigation provided further support for that thought suppression was substantial correlate of ruminative thinking, both of which directly contributed to adolescent depression as well as indirectly mediated the linkages between metacognitions and depressive symptomatology. The current data attested the basic assumptions of S-REF model of depression (Papageorgiou & Wells, 2003, 2009) and response styles theory (Nolen-Hoeksema et al., 2008) among a relatively large sample of adolescents. Keeping in mind, however, the present study had a cross-sectional design that findings could have differentiated in a repeated measure design study; therefore, these results should be interpreted with caution. Further studies should be conducted to warrant these relations in clinical and non-clinical populations.

Despite the dearth of the research considering the parallels between pathological worry and thought control strategies, data have consistently reported substantial linkages to cognitive avoidance both of which were significantly associated with metacognitive beliefs (Fialko et al., 2012; Gosselin et al., 2007; Laugesen et al., 2003). Our results pointed out that both thought suppression and pathological worry were significant correlates of distraction in adolescent metacognitive model of depressive symptomatology; contrarily to literature, modification indices did not propose a covariance between thought suppression and worry. On the other hand, direct and indirect linkages between worry and thought suppression need further elaborations in children and adolescents.

This study has several limitations. First, this was a cross-sectional design study that a longitudinal design

investigation could have given subtly or drastically different results. Second, we explored the convergent validity of the Turkish version of the CRSS using psychological constructs far more relevant to models of depressive symptoms such as meta-cognitions, pathological worry, and thought suppression rather than direct correlates of response styles. Turkish version of the Children's Response Style Questionnaire (Özgülük et al., 2012) could have been utilized to assess criterion validity of the CRSS. Third, the current sample consisted of non-clinical adolescents that findings should be replicated in clinical samples.

Finally, despite the documentation supporting rumination was robust, the definitions have not been converged on a uniform basis rather ruminative response styles have been represented as a multi-faced construct and differentially conceptualized in various lines of research (Smith & Alloy, 2009). As emphasized and empirically tested in the present study, S-REF theory integrates rumination into a broader conceptualization of metacognitive self-regulation model (eg., Wells, 2000). As such, Rumination and Self-Regulation model defines rumination as a volitional response to stress that interferes with the self-regulation capacity (Beckmann & Kellmann, 2004). The Rumination on Sadness model defines the construct as repetitive thoughts about sadness (Conway, Csank, Holm, & Blake, 2000), the Stress-Reactive model outlines negative event-related thoughts immediate to an adverse stressful event (Alloy et al., 2000), and the Goal-Progress model views rumination as a reaction in the face of a failure to progress satisfactorily towards personal goals (Martin, Shrira, & Startup, 2004). Multidimensional model of Fritz (1999) suggests three subtypes of rumination following trauma as instrumental, emotion-focused and searching for meaning. Garnefski, Kraaij, and Spinhoven (2001) proposed a model of Cognitive Emotion Regulation in which rumination is one of coping strategies in dealing cognitively with stressful situations. Given these many conceptualizations of rumination, some aspects of the multifaced construct may function maladaptively in response to stress, whereas other aspects may serve to emotion regulation least dysfunctionally or adaptively. For instance, relying on Rumination on Sadness model, linkages of depression with "ruminating about the reasons for my sadness" (Causal Analysis), "ruminating about the meaning of my sadness" (Understanding), and "uncontrollability of this ruminative thinking on my sadness" (Uncontrollability) were examined in non-clinical samples. It was found that uncontrollability of rumination was the most predictive of depressive symptoms (Raes, Hermans, Williams, Bijttebier, & Eelen, 2008). That is, further studies involving with differential definitions of rumination should be conducted to investigate the relations between variables addressed in the present study among adolescents. Also comparative studies between adolescents and adult samples would provide overlapping and distinctive features of rumination in relation to depressive symptomatology.

Despite the caveats of the present investigation, the Turkish version of the CRSS revealed sound and promising features indeed. In the current study, rumination, worry and thought suppression had significant linkages to depressive symptoms, and distraction was preventive from depression as expected. Rumination was a statistically significant correlate of both thought suppression and pathological worry. Moreover, we confirmed the hypothesized indirect relations between metacognitions and depressive symptomatology mediated by rumination, worry and thought suppression but not distraction among adolescents.

Acknowledgement

The paper used a part of the data set from the first author's master dissertation, expertly advised by the second author.

Disclosure statement

The authors report no financial or other relationship relevant to the subject of this article

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