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ORIGINAL ARTICLE

Latent Growth Curve Analysis of Gender Differences in Response Styles and Depressive Symptoms during Mid-Adolescence

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Abstract Consistent with Response Styles Theory, this study aimed to examine the prospective associations between changes in response styles and depressive symptoms during mid-adolescence, with a focus on gender differences. A 2-year longitudinal study was conducted consisting of three waves, each separated by 1 year. The participants were 663 Spanish adolescents ($M = 13.50$, $SD = .75$) who individually completed the Children's Depression Inventory-Short and a short version of the Children's Response Styles Scale. Girls showed higher rumination and lower distraction than boys and more depressive symptoms. A multivariate latent growth curve model indicated that the increase in depressive symptoms during mid-adolescence in girls was associated with an increase in rumination and a decrease in distraction. After a 2-year follow-up, changes in response styles to negative affect (in rumination and distraction independently and in the ratio score) were interrelated with the changes in depressive symptoms in adolescent girls.

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Introduction

There is a specific risk during adolescence for the development of depressive disorders (Abela and Hankin 2008; Allen and Sheeber 2008). Approximately 14% of adolescents between 13 and 18 years old meet depressive disorder criteria in the USA (Merikangas et al. 2010). In Europe, approximately 11% of German teenagers between 11 and 17 years old suffer from significant depressive symptoms (Ravens-Sieberer et al. 2008), whereas this percentage is 10.3% among Spanish adolescents (Escriba Quijada et al. 2005). Prospective community-based studies have demonstrated an increase in clinical depression rates from childhood to late adolescence (Costello et al. 2003), with the peak age for the onset of depression occurring during mid-adolescence, between approximately 13 and 15 years old (Lewinsohn and Essau 2002). Epidemiological research has consistently demonstrated a marked increase in the presence of depression during adolescence in modern societies (Ogden and Hagen 2013). Furthermore, studies consistently indicate that gender differences in risk for depression also first emerge in adolescence (Strauman et al. 2011). No gender differences are identified before 13 years; however, the presence of depressive symptoms and disorders intensively increases in girls between the ages of 13 and 15. In contrast, the depression risk in boys remains relatively stable during this period (Hankin and Abramson 2001; Hilt and Nolen-Hoeksema 2008).

Depression has a substantial impact on psychological development, school performance and family and peer relationships during childhood and adolescence (Essau and

Chang 2009). This problem may also be an important risk factor for substance abuse (Marmorstein 2010) and suicide attempts (Nock et al. 2013). Moreover, a possible continuity of a depressive disorder from adolescence to adulthood has been documented (Weissman et al. 1999). The dramatic impact of depression during development highlights the importance of identifying the factors involved in its development, maintenance and severity (Braet et al. 2014; Cicchetti and Toth 2012; Garber 2007).

One of the theories with greater empirical support that explains depression emergence and gender differences is the Response Styles Theory (Nolen-Hoeksema et al. 2008). The Response Styles Theory argues that the way in which individuals respond to depressive symptoms determines both the severity and duration of the symptoms (Nolen-Hoeksema 1991, 2000). According to Treynor et al. (2003), rumination is a style of response to negative affect characterized by repetitive and passive thinking about negative emotions and about the causes and consequences of these emotions. Rumination is thought to exacerbate and prolong depressive symptoms by activating negative thoughts and memories, which interferes with adaptive coping and problem resolution and with the development of pessimistic and fatalistic thoughts (Nolen-Hoeksema 1991). In contrast to rumination, distraction is an adaptive and instrumental response style to negative affect. Distraction refers to the diversion of attention away from the depressed mood by turning it into neutral or pleasant thoughts and actions to alleviate the current mood state.

Whether the use of these response styles differs by gender and whether these differences may account for the differential patterns of depression development in girls and boys are important issues to consider. Clear evidence has been reported in research based on both self-report and laboratory measures showing that women are more likely to ruminate than men. More importantly, research to date has demonstrated that gender differences in response styles moderate gender differences in adult depression (for a review, see Johnson and Whisman 2013; Nolen-Hoeksema 2012). Because gender differences in depressive symptoms emerge during adolescence, it would be expected that gender differences in response styles also develop during the transition between childhood and adulthood. Indeed, a meta-analysis with children and adolescent samples conducted by Rood et al. (2009) indicated that rumination has a stable and significant effect on future and concurrent depression levels; moreover, the gender differences in rumination emerge during adolescence. In contrast, no significant results were observed for the distraction response. To date, most studies that have examined the relationship between response styles and depressive symptoms in adolescent samples have used cross-sectional designs. These studies have demonstrated that rumination was positively correlated with depressive symptoms, whereas distraction exhibited negative correlations (Muris et al. 2009; Papadakis et al. 2006).

Cross-sectional studies are important for understanding associations among variables; however, this design cannot account for the relationships between antecedents and consequences. Thus, longitudinal studies can offer insight into the directionality of the relationships among these variables (Abela et al. 2002; Burwell and Shirk 2007; Broderick and Korteland 2004; Hankin 2008). Schwartz and Koenig (1996) identified gender differences in rumination but not in distraction in a sample of adolescents from the USA. These authors concluded that gender differences in rumination did not completely explain gender differences in depression after a 6-weeks follow-up. In the Netherlands, Roelofs et al. (2009) determined that an increased tendency to ruminate than to distract in teenagers was related to increased levels of depression and anxiety after a 10-week follow-up, without differences between boys and girls. Hilt, McLaughlin and Nolen-Hoeksema (2010) conducted a longitudinal study with three assessments during one academic year in a sample of adolescents from the USA. They demonstrated that an increased tendency to ruminate predicted an increase in depressive symptoms during adolescence. These authors determined that girls reported increased rumination than boys and that these higher scores accounted for their more pronounced depressive symptoms, whereas no gender differences were identified in distraction responses. Furthermore, Abela et al. (2007) investigated Canadian children and adolescents aged 7–12 and determined that the tendency to ruminate predicted increases in depressive symptoms, whereas the tendency to distract predicted decreases in depressive symptoms over a 6-week follow-up interval. Importantly, they underscored a greater association between the ratio scores (the rumination score divided by the distraction score) and depression symptoms than between depression symptoms and either rumination or distraction; thus, a higher use of rumination compared to distraction predicted more depressive symptoms at the end of the study. However, no gender differences were detected for either rumination or distraction responses. Further, there were no consistent gender differences in the ratio scores. Following a 2-year follow-up in Canadian and US adolescents, Abela and Hankin (2011) demonstrated that increased levels of rumination were associated with an increased likelihood of experiencing an onset of new depressive episodes when the adolescents suffered negative life events. In this study, no gender differences were observed for rumination, and no moderation effect of gender was detected in the longitudinal association with depression.

Thus, no concluding results have been documented regarding gender differences in either rumination or

distraction in adolescence, and no strong longitudinal empirical support has been provided for the Response Styles Theory predictions for this developmental period (i.e., the moderating role of gender in the association between response styles and depression development). Nevertheless, a limited number of longitudinal studies have investigated the associations between response styles and depressive symptoms in adolescence, and most of these studies were conducted with two assessments and after a short follow-up period (several weeks or months). A design comprising several assessment times is necessary to clarify whether there are gender differences in the trajectory of changes in depressive symptoms and response styles during mid-adolescence. Furthermore, the literature on Response Styles Theory has not provided conclusive findings regarding the role of distraction in gender differences in depressive symptoms during adolescence. Importantly, no study to date has developed a confirmatory model that integrates the change in response styles (both rumination and distraction) and the change in depressive symptoms during mid-adolescence. Latent growth curve models are a type of structural equation model appropriate for analyzing longitudinal data from a developmental framework (Duncan et al. 2013). They enable an estimation of the trajectory of change over time and an assessment of how the changes in multiple variables may be interrelated (Duncan and Duncan 2009).

Consequently, the present study has the following aims: (a) to examine the change trajectories during mid-adolescence in depressive symptoms and response styles (rumination and distraction independently and the composed ratio score of these factors) by gender and (b) to develop a confirmatory model to investigate the relationship between changes in response styles and depressive symptoms. Regarding the first aim, we hypothesized an increase in depressive symptoms in adolescent girls (first hypothesis), which is consistent with data reviewed by Hilt and Nolen-Hoeksema (2008). We also expected a significant increase in rumination in girls (second hypothesis), which supports the gender differences in this response style reported by Hilt et al. (2010) and in the review by Rood et al. (2009). Consistent with previous research, no gender differences in distraction (third hypothesis) (Hilt et al. 2010; Schwartz and Koenig 1996) or in the ratio response (fourth hypothesis) were expected, as observed by Abela et al. (2007). Concerning the second aim, we expected an association between increases in rumination and increases in depressive symptoms (fifth hypothesis), which is consistent with the longitudinal associations reported by Roelofs et al. (2009). We also hypothesized that distraction would be negatively related to an increase in depressive symptoms (sixth hypothesis), which is consistent with the longitudinal relationships identified by Abela et al. (2007). Furthermore, we also hypothesized that the ratio of the response styles would be positively related to depressive symptoms after the follow-up (seventh hypothesis), which has also been indicated by Abela et al. (2007). Therefore, increases in the use of rumination over distraction were expected to be associated with increases in depressive symptoms. Finally, we expected to identify a gender moderation effect in prospective associations between response styles and depressive symptoms (eighth hypothesis), which is consistent with Response Styles Theory (Nolen-Hoeksema 2012; Johnson and Whisman 2013; Rood et al. 2009). Thus, changes in responses styles were hypothesized to be related to an increase in depressive symptoms only in adolescent girls.

Methods

Participants

The participants were 663 Caucasian adolescents (51.3% girls) aged between 12 and 15 years old ($M = 13.50$, $SD = .75$) at the beginning of the study. The participants were enrolled in 16 secondary schools located in Andalusia (Spain). The sampling process was partially random because the selection of secondary schools that participated in this study was controlled to include different ownerships (public or private), environments (rural, semi-urban or urban) and neighborhoods with different socio-economic levels. Two classrooms were then randomly selected in each secondary school, so that the participants were initially enrolled in the first year of compulsory secondary education (50.7%) or the second year (49.3%). The students in the first course were aged 12–13 years old and the students in the second course were aged 14–15 years old. Therefore, the participants were within two age cohorts (according to the initial academic year and the class assessed) in mid-adolescence, which is the developmental stage in which previous literature sets the onset of initial depressive disorders and the emergence of gender differences. Given the compulsory nature of schooling in secondary education (until 16 years old in Spain), secondary schools represent an excellent place for conducting a follow-up study during adolescence. As many as 73.9% of the participants completed the three waves of the evaluation across the study, whereas 19.2% only completed the evaluations at times 1 and 2, and 6.9% at times 1 and 3. This attrition rate was a result of the participants' lack of attendance in class at the time of the evaluation or a change of school. Contact information was not collected; thus, the missing participants could not be contacted to complete the third assessment.

Study Design and Data Collection Procedure

A 2-year follow-up study was carried out comprising three waves of assessment, each separated by 1 year. To collect data, a self-report instrument was administered to secondary school students in their respective classrooms. No student refused to participate in the study, and all adolescents in their respective classrooms individually completed the instrument. The participants did not receive a reward or incentive for their participation in the study. The tracking of the participants was made possible by a code created from the number of the educational institution (1–18) and the participant's birth date and gender (one boys, two girls). The present study respected all principles embodied in the Declaration of Helsinki, and the adolescents voluntarily participated and were verbally informed regarding the characteristics of the survey, which were also described on the first page of the self-report instrument. Informed consents were obtained from all parents and from the adolescents who participated in the study. The evaluations were conducted on dates scheduled in advance with the school management teams. This research obtained approval from the university ethics board.

Instruments and Variables

The self-report instrument consisted of two scales to measure depressive symptoms and response styles, respectively.

Depressive Symptoms

The Spanish version of the Children's Depression Inventory-Short (CDI-S) was administered (Kovacs 1992; Del Barrio et al. 2002). This ten-item scale assesses the presence and severity of depressive symptoms in children and adolescents. Previous studies have demonstrated the excellent psychometric properties of this short version, indicating its suitability for research purposes as an alternative to the full version (Del Barrio et al. 2002) and its validity as a screening tool in pediatric care (Allgaier et al. 2012). Each item measures one depressive symptom, and the participant must choose between three response options (i.e., sadness: "I am sometimes sad", "I am often sad", or "I am sad all the time"). The options are encoded as 0, 1 and 2, where 0 indicates no symptoms and two indicates maximum severity. The overall score is calculated by adding the scores for the ten items. The final score on the scale ranges between 0 and 20, and a higher score indicates an increased presence of depressive symptoms. Furthermore, in the present study, the CDI-S exhibited good internal consistency reliability, with a Cronbach $\alpha = .76$ in each assessment wave in the study.

Response Styles

A short version of the Spanish adaptation of the Children's Response Styles Scale (CRSS; Ziegert and Kistner 2002) was administered. The CRSS was adapted to Spanish late adolescents and young adults by Extremera and Fernandez-Berrocal (2006). A short version of this Spanish adaptation of the CRRS was validated by Gomez-Baya (2014), reporting good psychometric properties in mid-adolescents in Andalusia (Spain). In that previous work, the scale was reduced for methodological reasons (i.e. the administration of the instrument should be conducted in less than 30 min) by selecting the six items with higher saturation in factorial analyses of rumination subscale and distraction subscale, after checking that there was no comprehension problem. Thus, this scale was composed of 12 items that corresponded with items 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16 and 19 from the full CRSS version. These 12 statements assess what adolescents think or how they behave when they feel sad. The scale was introduced by the following heading: "Indicate how often you do each of the following things when you feel sad or depressed". The items were divided into two six-item subscales; one scale assessed ruminative responses ("I go away by myself and think about why I feel this way", "I go someplace alone to think about my feelings", "I think, why can't I stop feeling this way?", "I think about what made me feel like this", "I replay in my head what happened", and "I think about my feelings"), whereas the second scale assessed distraction responses ("I do something I really like to do", "I think, I'm going to do something to make myself feel better", "I do something that has made me feel better in the past", "I think about fun things", "I concentrate on something else that makes me happier", and "I try to take my mind off my feelings by doing something I like"). The participants provided their responses using a four-point Likert-response scale: "almost never", "sometimes", "often" and "almost always". These options were scored from 1 to 4, and the overall score in each subscale was obtained by adding the scores from the options selected in the respective items. Furthermore, a Rumination/Distraction ratio score was calculated to assess the relative use of each response style according to Abela et al. (2007). Both the rumination and distraction subscales exhibited excellent internal consistency reliability in each time of the present study (Rumination: time 1 $\alpha = .83$, time 2 $\alpha = .82$ and time 3 $\alpha = .83$; Distraction: time 1 $\alpha = .86$, time 2 $\alpha = .87$ and time 3 $\alpha = .88$).

Data Analysis Design

Following indications by Kristman et al. (2005), to account for attrition, differences were analyzed between the participants who did not complete any of the assessments and

the participants who completed all three assessments. To compare these groups with respect to socio-demographic characteristics and the baseline scores with respect to response styles and depressive symptoms, Pearson, χ^2 and variance analyses were conducted. A Little test was also performed to test that the missing values were completely random (Little 1988). All analyses were performed using SPSS version 21.0 (IBM Corp 2012). We used an α level of .05 for all statistical tests. If a random distribution of missing values was identified, a maximum likelihood imputation based on an expectation-maximization algorithm was performed. The descriptive statistics were subsequently described, and the gender and age differences in the study variables were analyzed via variance analyses.

Regarding the first aim in the study (i.e., to investigate the change trajectories in depressive symptoms and response styles by gender), the inter and intra individual changes in depressive symptoms and response styles were assessed via the development of latent growth curve models. A latent growth curve model is a statistical technique that integrates the modeling of individual growth (hierarchical linear model) and structural equation modeling (Bollen and Curran 2006). Program EQS 6.1 was applied to estimate the adjustment of the models, based on covariance matrices and following the maximum likelihood estimation method (Byrne 2013). In the initial step in this analysis, unconditional models of growth for each variable (depressive symptoms, rumination, distraction and the response style ratio) were examined to identify the statistical model that best described the respective growth. A growth model with two factors was tested. The first factor is referred to as the intercept and represents the initial values of the variable. This factor is constant for each subject over time; thus, factorial saturations would take the value of 1 for each of the measures. The second factor is referred to as the slope and describes the changes over time (Preacher et al. 2008). To determine whether each growth model is best described as a linear model or a nonlinear model, these two different models for each variable were tested, following the procedure by Reitz et al. (2007). Following the identification of the models that best described the growths of the study variables, multi-group analyses were conducted, similar to Dekovic et al. (2004). In these multi-group analyses, latent growth curve models for each variable were compared by gender and age in each gender. Two age groups were created to compare a younger group aged 12–13 years old with an older group aged 14–15 years old in each gender. The free estimated parameters were proposed to be different by group in the unconstrained models and equal in the constrained models. Specifically, these free estimated parameters were the effect of the constant (1) on the intercept and the slope factors, the variances of the intercept and slope, and the variance of the measurement errors of the indicators in the three assessments. To test the overall goodness of fit in each model, a Satorra Scaled χ^2 statistic was calculated. However, given that this indicator is very sensitive to the sample size, the ratio of the value of χ^2 and the degrees of freedom (*df*) were analyzed. A value <3 in this ratio indicates a good data fit (Kline 1998). Furthermore, the comparative goodness of fit index (CFI) was calculated, in which a value >.95 indicates a good adjustment (Hu and Bentler 1999). Differences in the Satorra Scaled χ^2 and CFI were calculated, as well as the χ^2 tests for the differences in each constrained parameter (Bryant and Satorra 2012; Cheung and Rensvold 2002). A probability of the Satorra Scaled χ^2 difference less than .05 and a difference in the CFI greater than .01 indicates significant differences in the overall adjustment. In each constrained path, $p < .05$ in each χ^2 test indicates significant differences between the groups.

Regarding the second aim in the study (i.e., to investigate the relationship between the changes in response styles and depressive symptoms), two multivariate models were developed by associating the unconditional models previously tested. Specifically, the multivariate latent growth curve models established bidirectional associations between: a) the intercepts and slopes of rumination and distraction with the depressive symptom intercept and slope, respectively; and b) the intercept and slope of response style ratio with the intercept and slope of depressive symptoms. Multi-group analyses were also conducted to compare the overall adjustment (Satorra Scaled χ^2 and CFI) of the models by gender or age, depending on the results in the previous unconditional models tested. In the constrained models, the associations between the intercept factors and between the slope factors of the variables were proposed to be equal between the groups, whereas they were proposed to be different in the unconstrained models. χ^2 tests in each constrained path enabled assessments of group differences in the associations proposed in the two models.

Results

Attrition Analysis and Descriptive Statistics

No differences were identified between the participants who completed all assessments and the participants who did not complete assessment 2 or 3 with respect to rumination, $F(2, 634) = .644$, $p = .526$, or distraction baseline scores, $F(2, 635) = 1.34$, $p = .264$. Differences were identified in the baseline depressive symptoms, $F(2, 655) = 6.94$, $p = .001$, and Bonferroni post hoc tests indicated that the participants who completed the three

waves reported fewer depressive symptoms than participants who did not participate in wave 3, $MD = -.96$, $SE = .28, p = .002$. No differences were found with respect to gender, $\chi^2(2, N = 663) = .928$, $p = .629$. Furthermore, the 15-year-old participants in wave 1 showed higher dropout rates in waves 2 and 3, $\chi^2(6, N = 663) = 16.33$, $p = .012$. Second, the Little test indicated that the missing values in the study variables were distributed completely at random, $\chi^2(260, N = 663) = 271.40$, $p = .301$. A maximum likelihood imputation procedure, based on an expectation-maximization algorithm, was conducted by including all relevant study variables (i.e. response styles and depressive symptoms in each assessment time) as predictors and variables to be imputed, in order to address the missing values.

In the final imputed sample, the results indicated that girls presented more depressive symptoms, $F(1, 661) = 28.24$, $p < .001$, $\eta_p^2 = .041$, more rumination, $F(1, 661) = 24.66$, $p < .001$, $\eta_p^2 = .036$, and less distraction, $F(1, 661) = 13.26$, $p < .001$, $\eta_p^2 = .020$. The ratio scores were also higher for girls, $F(1, 661) = 35.64$, $p < .001$, $\eta_p^2 = .051$; thus, girls used more rumination than distraction when they felt sad than boys did. Table 1 presents the descriptive statistics for the depressive symptoms, rumination response, distraction response and ratio of response styles in each assessment by gender. Regarding age, no differences were detected in depressive symptoms, $F(3, 659) = .75$, $p = .525$, rumination, $F(3, 659) = .55$, $p = .646$, distraction, $F(3, 659) = .82$, $p = .484$, or the ratio score, $F(3, 659) = 1.19, p = .313$, in any assessment wave of the study.

Unconditional Latent Growth Curve Models of Changes in Depressive Symptoms and Response Styles

First, the linear and nonlinear latent growth models were compared in each variable. In the linear models, all saturations were fixed following a linear timescale (0, 1 and 2), whereas in the nonlinear models, the third measurement was freely estimated. No significant differences were identified between the linear and nonlinear models in depressive symptoms, $\Delta\chi^2 = .22$, $\Delta df = 1$, $p = .639$, rumination, $\Delta\chi^2 = 1.04$, $\Delta df = 1$, $p = .308$, distraction, $\Delta\chi^2 = .71$, $\Delta df = 1$, $p = .399$, or the ratio of response styles, $\Delta\chi^2 = 1.19$, $\Delta df = 1$, $p = .255$. Thus, because the nonlinear model did not improve the fit of the linear model, the linear representation of change over time (i.e., straight-line growth) was retained for the subsequent analyses because of its increased simplicity.

A multigroup analysis was subsequently conducted to assess gender differences in the latent growth models of the study variables. Table 2 presents the results of the multigroup analyses to determine gender differences in the latent growth models of depressive symptoms, rumination, distraction, and the response style ratio. The mean and variance scores for the intercepts and slopes were considered, as well as the covariance between the intercepts and slopes. In the unconstrained models, the parameters were independently analyzed for boys and girls, whereas in the constrained models, the parameters represented all participants. All freely estimated parameters were compared, as well as the overall fit for each latent growth curve model. Regarding depressive symptoms, both the constrained and unconstrained models presented a good overall fit with the data; however, significant differences were identified between the two models and the constrained model fit significantly worse than the unconstrained model. The results indicated that there were significant gender differences in the structure of the depressive symptom latent growth curve model. The intercept mean was significantly higher in girls than in boys, and the slope mean was only significant in girls. Thus, girls initially presented more depressive symptoms than boys, and there was a significant increase in depressive symptoms only in girls. The covariance between the intercept and slope of depressive symptoms were not significant in boys or girls. The intercept variances were significant in both boys and girls, which indicates individual differences in the initial values in depressive symptoms. The slope variance was significant for girls; thus, individual differences were identified in the rate of change in depressive symptoms in this subsample.

Furthermore, significant gender differences were identified in the structure of the latent growth curve in the rumination response, and only the unconstrained model exhibited a good data fit. Differences were identified between boys and girls in the intercept mean and the slope mean; thus, girls ruminated more than boys and experienced a significant increase in this response style after the follow-up. The covariance between the rumination intercept and the slope was not significant for either girls or boys. The intercept variance was significant for girls and boys, which suggests that there were individual differences in the initial levels of rumination. Concerning the distraction response, the constrained and unconstrained models were also significantly different, because the unconstrained model fit better than the constrained model. Thus, gender differences in the model structure were identified. Girls presented lower distraction than boys, and a significant decrease in distraction was identified only in girls. No significant covariance was identified between the intercept and slope in the distraction responses in either gender. The variance of the intercept was significant in boys and girls; thus, there were also individual differences in the initial values of the distraction response. Finally, the latent growth curve model of the ratio score also exhibited different structures by gender. Only the unconstrained model

Table 1 Descriptive statistics of study variables by gender

Variable	Time	Sample						Gender differences
		Boys		Girls		Total		
		M	*SD*	*M*	*SD*	*M*	*SD*	
DS	1	3.13	2.72	3.96	2.85	3.55	2.82	$t(661) = -3.80$, $MD = -.82$, $SE = .22$, $p < .000$
	2	3.30	2.60	4.17	2.86	3.75	2.77	$t(661) = -4.07$, $MD = -.87$, $SE = .21$, $p < .000$
	3	3.27	2.57	4.43	2.66	3.87	2.68	$t(661) = -5.73$, $MD = -1.16$, $SE = .20$, $p < .000$
RU	1	14.94	4.75	16.04	4.69	15.50	4.75	$t(661) = -2.99$, $MD = -1.10$, $SE = .37$, $p = .003$
	2	15.08	4.39	16.78	4.28	15.95	4.41	$t(661) = -5.04$, $MD = -1.70$, $SE = .34$, $p < .000$
	3	15.45	4.21	16.73	4.13	16.11	4.21	$t(661) = -3.93$, $MD = -1.27$, $SE = .32$, $p < .000$
DI	1	17.28	4.84	16.46	4.88	16.86	4.87	$t(661) = 2.14$, $MD = .81$, $SE = .38$, $p = .032$
	2	16.90	4.29	15.82	5.02	16.35	4.70	$t(661) = 2.99$, $MD = 1.08$, $SE = .36$, $p = .003$
	3	16.72	4.27	15.53	4.54	16.11	4.45	$t(661) = 3.49$, $MD = 1.19$, $SE = .34$, $p = .001$
RA: RU/DI	1	.97	.56	1.11	.60	1.04	.59	$t(661) = -3.12$, $MD = -.14$, $SE = .05$, $p = .002$
	2	.96	.42	1.23	.70	1.10	.60	$t(661) = -5.98$, $MD = -.27$, $SE = .04$, $p < .000$
	3	1.00	.44	1.22	.65	1.11	.57	$t(661) = -5.24$, $MD = -.22$, $SE = .04$, $p < .000$

DS depressive symptoms, *RU* rumination, *DI* distraction, *RA* ratio score

showed good overall fit with data, so that gender moderation was supported. The intercept mean was increased in girls, and the slope mean was only significant in girls; thus, girls used rumination more often than distraction and exhibited a significant increase in this relative use of rumination compared with distraction. In boys, there was no significant change in this ratio, and the intercept mean was less than 1, which indicates an increased use of distraction compared with rumination. Gender differences in the covariance intercept-slope were detected; however, these covariances were not significant in either boys or girls. Moreover, the intercept variances of girls and boys reached significance; thus, individual differences were identified in the initial values of this ratio. The variance of the slope was significant only in girls, which indicated individual differences in the rate of change in the ratio scores in girls.

Another multi-group analysis was conducted to assess age cohort differences in the subsample of boys and girls independently. To conduct these multi-group analyses, two groups were created (12–13 years old and 14–15 years old) to compare the two age cohorts. In depressive symptoms, no age cohort differences were identified because no significant differences were identified between the constrained and unconstrained models in girls, $\Delta\chi^2 = 7.95$, $\Delta df = 8$, $p = .438$, $\Delta\text{CFI} = .013$, or in boys, $\Delta\chi^2 = 9.50$, $\Delta df = 8$, $p = .302$, $\Delta\text{CFI} = .027$. No age cohort differences were identified in rumination in boys, $\Delta\chi^2 = 6.88$, $\Delta df = 8$, $p = .550$, $\Delta\text{CFI} = .000$, or girls, $\Delta\chi^2 = 9.87$, $\Delta df = 8$, $p = .274$, $\Delta\text{CFI} = .000$, or in distraction in boys, $\Delta\chi^2 = 3.78$, $\Delta df = 8$, $p = .876$, $\Delta\text{CFI} = .000$, or girls, $\Delta\chi^2 = 12.74$, $\Delta df = 8$, $p = .121$, $\Delta\text{CFI} = .009$. No age cohort differences were identified in the ratio score in boys, $\Delta\chi^2 = 8.05$, $\Delta df = 8$, $p = .429$, $\Delta\text{CFI} = .016$, or girls, $\Delta\chi^2 = 5.72$, $\Delta df = 8$, $p = .678$, $\Delta\text{CFI} = .000$.

Finally, a Wald test indicated that the covariances between the intercepts and slopes were not significant, and they may be removed in the depressive symptom model, $\chi^2(1, N = 663) = 1.19$, $p = .407$, the rumination model, $\chi^2(1, N = 663) = 3.433$, $p = .064$, the distraction model, $\chi^2(1, N = 663) = 3.179$, $p = .075$, and the ratio model, $\chi^2(1, N = 663) = 3.268$, $p = .071$.

Multivariate Model of the Associations of Changes in Depressive Symptoms and Response Styles

There were no significant changes in the depressive symptoms or response styles in the subsample of boys; thus, multivariate models of the associations between the changes in depressive symptoms and the changes in response styles were only developed for girls.

The first multivariate model established: (1) the associations between the intercepts of rumination and distraction and the intercept of depressive symptoms, and (2) the associations between the slopes of rumination and distraction and the depressive symptom slope. Figure 1 schematically represents this multivariate model indicating path loadings, and Table 3 summarizes the results. No differences were identified by age cohort because no significant differences were identified between the constrained and unconstrained model in the overall fit or in each constrained parameter. The results of the constrained model

Table 2 Unconditional model of growth in depressive symptoms, rumination, distraction and response style ratio by gender

	Unconditional model (linear)	Intercept		Slope		Covariance β	Difference in constraints	Overall fit satorra scaled χ^2	Difference in overall fit
		M	σ^2	*M*	σ^2				
DS	Constrained	3.57*	5.19*	.15*	.92*	−.30	E1–E1: $\chi^2 = .044$, $p = .834$	$\chi^2(10, N = 663) = 20.78$, $p = .023$, $\chi^2/df = 2.08$, CFI = 1	$\Delta\chi^2 = 19.81$, $\Delta df = 8$ $p = .011$, ΔCFI = .000
							E2–E2: $\chi^2 = .670$, $p = .413$		
	Unconstrained						E3–E3: $\chi^2 = .176$, $p = .675$	$\chi^2(2, N = 663) = .973$, $p = .615$, $\chi^2/df = .49$, CFI = 1	
	Boys	3.18*	4.29*	.05	.69	−.23			
	Girls	3.95*	5.82*	.24*	1.19*	−.39	D1–D1: $\chi^2 = .422$, $p = .516$		
							D2–D2: $\chi^2 = .185$, $p = .667$		
							D2–D1: $\chi^2 = .031$, $p = .861$		
							F1-1: $\chi^2 = 28.318$, $p < .001$		
							F2-1: $\chi^2 = 18.132$, $p < .001$		
RU	Constrained	15.56*	10.90*	.29*	1.60*	−.33	E1–E1: $\chi^2 = .004$, $p = .949$	$\chi^2(10, N = 663) = 32.97$, $p < .001$, $\chi^2/df = 3.30$, CFI = 1	$\Delta\chi^2 = 28.70$, $\Delta df = 8$ $p < .001$, ΔCFI = .000
							E2–E2: $\chi^2 = .851$, $p = .356$		
	Unconstrained						E3–E3: $\chi^2 = 1.422$, $p = .233$	$\chi^2(2, N = 663) = 4.27$, $p = .118$, $\chi^2/df = 2.14$, CFI = 1	
	Boys	14.90*	10.98*	.26	1.36	−.41			
	Girls	16.22*	9.59*	.29*	1.50	−.24	D1–D1: $\chi^2 = .036$, $p = .850$		
							D2–D2: $\chi^2 = .150$, $p = .699$		
							D2–D1: $\chi^2 = .003$, $p = .955$		
							F1-1: $\chi^2 = 23.664$, $p < .001$		
							F2-1: $\chi^2 = 9.693$, $p = .002$		
DI	Constrained	16.81*	11.49*	−.37*	1.45	−.39	E1–E1: $\chi^2 = .427$, $p = .513$	$\chi^2(10, N = 663) = 25.39$, $p = .005$, $\chi^2/df = 2.54$, CFI = .989	$\Delta\chi^2 = 24.65$, $\Delta df = 8$ $p = .002$, ΔCFI = .011
							E2–E2: $\chi^2 = 4.826$, $p = .028$		
	Unconstrained						E3–E3: $\chi^2 = .416$, $p = .519$	$\chi^2(2, N = 663) = .737$, $p = .691$, $\chi^2/df = .369$, CFI = 1	
	Boys	17.23*	8.97*	−.27	.85	−.32	D1–D1: $\chi^2 = 4.335$, $p = .037$		
	Girls	16.42*	13.51*	−.47*	1.96	−.45	D2–D2: $\chi^2 = .594$, $p = .441$		
							D2–D1: $\chi^2 = 2.749$, $p = .097$		
							F1-1: $\chi^2 = 13.522$, $p < .001$		
							F2-1: $\chi^2 = 9.049$, $p = .003$		

Table 2 continued

	Unconditional model (linear)	Intercept		Slope		Covariance β	Difference in constraints	Overall fit satorra scaled χ^2	Difference in overall fit
		M	σ^2	*M*	σ^2				
RA	Constrained	1.05*	.20*	.04*	.04*	−.37	E1–E1: $\chi^2 = .081$, $p = .776$ E2–E2: $\chi^2 = 15.779$, $p < .001$	$\chi^2(10, N = 663) = 82.55$, $p < .001$, $\chi^2/df = 8.26$, CFI = .734	$\Delta\chi^2 = 77.49$, $\Delta df = 8$ $p < .001$, ΔCFI = .266
	Unconstrained						E3–E3: $\chi^2 = 11.902$, $p = .001$ D1–D1: $\chi^2 = 10.886$, $p = .001$ D2–D2: $\chi^2 = 11.811$, $p = .001$ D2–D1: $\chi^2 = 13.921$, $p < .001$ F1-1: $\chi^2 = 31.776$, $p < .001$ F2-1: $\chi^2 = 19.676$, $p < .001$	$\chi^2(2, N = 663) = 5.06$, $p = .080$, $\chi^2/df = 2.53$, CFI = 1	
	Boys	.95*	.11*	.02	.01	−.32			
	Girls	1.12*	.26*	.06*	.07*	−.41			

Study variables, variances, covariance and relationships with the constant: *DS* depressive symptoms, *RU* rumination, *DI* distraction, *RA* ratio score, *E1–E1* variance of the measurement error in item 1 of the variable, *E2–E2* variance of the measurement error in item 2 of the variable, *E3–E3* variance of the measurement error in item 3 of the variable, *D1–D1* variance of the intercept of the variable, *D2–D2* variance of the slope of the variable, *D2–D1* covariance between the intercept and slope, *F1-1* relationship between the constant with intercept or intercept mean, *F2-1* relationship between the constant with slope or slope mean

* Statistically significant at level $p < .05$

indicated a positive association between the intercept of rumination and the intercept of depressive symptoms, whereas the distraction intercept was negatively associated with the depressive symptom intercept. Thus, increased rumination and lower distraction were associated with more depressive symptoms in each wave of the study in the group of adolescent girls. Furthermore, the rumination slope exhibited a positive association with the depressive symptom slope, whereas the distraction slope exhibited a negative association. Thus, the increase in the rumination response and the decrease in distraction in adolescent girls was related to the increase in depressive symptoms after a 2-year follow-up. This model exhibited a good data fit, $\chi^2(83, N = 663) = 114.00$, $p = .014$, $\chi^2/df = 1.37$, CFI = .964.

The second multivariate model tested the associations between the intercept and slope of the response style ratio and the intercept and slope of the depressive symptoms, respectively (Table 3). No significant differences were found between girls aged 12–13 and girls aged 14–15 years old because the constrained and unconstrained models did not differ in the parameters or overall fit. The constrained model in girls exhibited a good data fit, $\chi^2(38, N = 663) = 53.91$, $p = .045$, $\chi^2/df = 1.42$, CFI = .959, and indicated a positive association between the intercept of the response style ratio and the depressive symptom intercept and a positive association between the ratio slope and the depressive symptom slope. Thus, increased ratio scores (i.e., higher use of rumination than distraction) were related to more severe depressive symptoms in each wave of the study. Regarding the slope associations, the increase in the ratio scores was linked with the increase in the depressive symptoms; thus, the increased use of rumination (compared with distraction) in girls was associated with the increase in depressive symptoms.

Discussion

The present study had two main objectives. First, we aimed to clarify the patterns of change in depressive symptoms and response styles during mid-adolescence, with a focus on gender differences. The results indicated a significant increase in depressive symptoms in the sample of girls after the 2-year follow-up, whereas no significant change was observed in boys. These findings confirmed our first

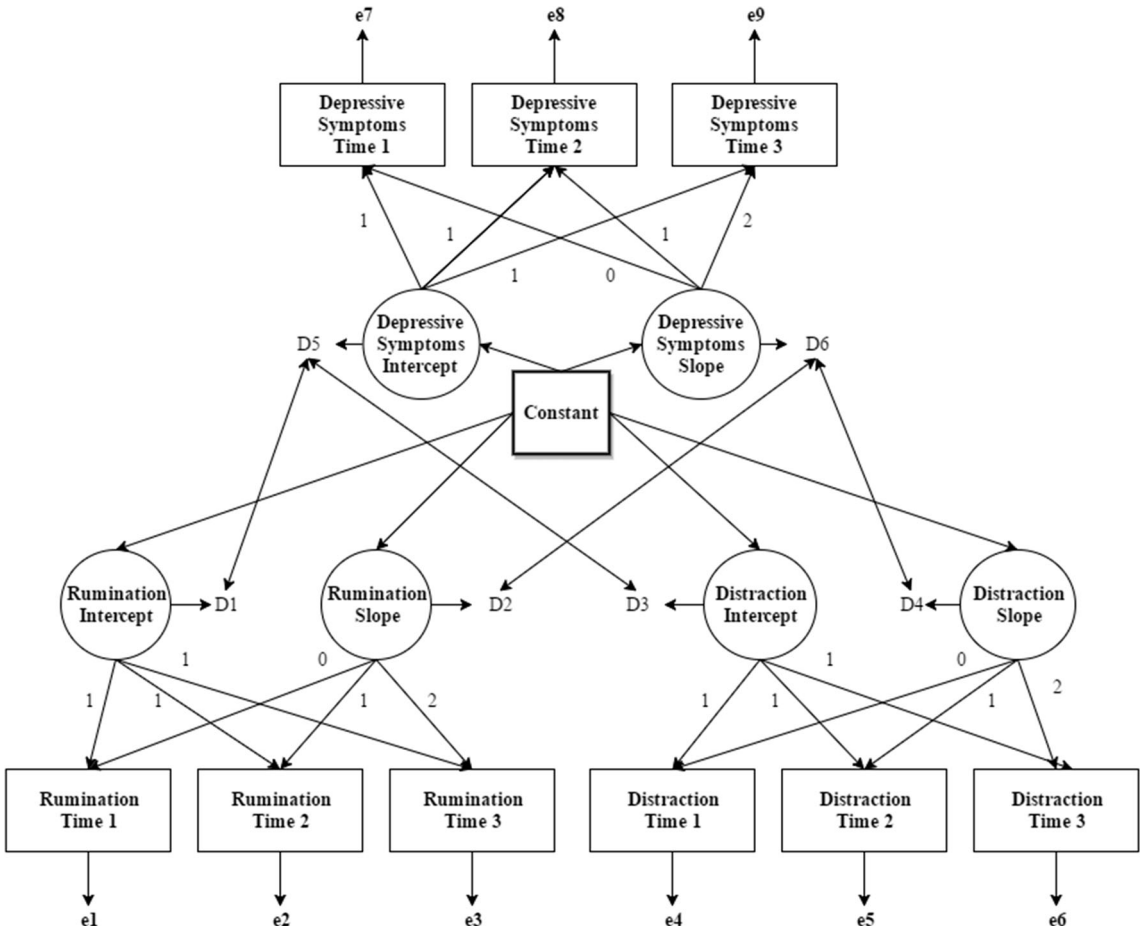

Fig. 1 Conceptual path diagram of the multivariate model of the associations between the intercepts and the slopes of response styles (i.e. rumination and distraction separately) and depressive symptoms

hypothesis and are consistent with previous studies, which concluded that during mid-adolescence, there is an increase in depressive symptoms and gender differences emerge in this regard (Hilt and Nolen-Hoeksema 2008; Lewinsohn and Essau 2002). An increase in the rumination response in the subsample of girls was also identified, which confirmed our second hypothesis and replicated previous literature on gender differences in depressive rumination and its emergence during this life stage (Hilt et al. 2010; Rood et al. 2009). Moreover, a significant decrease in the distraction response was identified from times 1–3 in girls, and significant gender differences in this response style were identified, with boys reporting more distraction against negative emotions compared with girls in all waves of the study. Gender differences in distraction are in contrast to our third hypothesis. Schwartz and Koenig (1996), Abela et al. (2007) and Hilt et al. (2010) did not identify support for these gender differences in distraction. However, these results support the Response Styles Theory (Nolen-Hoeksema 1991) prediction regarding gender differences in both response styles to negative affect during adolescence. The significant decrease in distraction in girls is a novel result. To date, no longitudinal study has identified a change in this response style or a differential change by gender. Regarding the response style ratio, a significant increase in the scores was identified in girls because they reported an increased use of rumination compared with distraction across time. These gender differences were again in contrast to the results by Abela et al. (2007) and our fourth hypothesis; however, these findings also provide evidence for gender differences not only in rumination but in both response styles. This contradiction with previous studies may be a result of the longer follow-up period during mid-adolescence (i.e., a 2-year follow-up, whereas most studies have used shorter periods of time) or the type of statistical analyses conducted (i.e., multi-group analyses in latent growth curve modeling to assess the different patterns of change in each variable by gender). These gender differences in the self-reported response styles may be explained by stereotype acceptance and benevolent sexism (Yoder and Lawrence 2011), as well as by more negative beliefs in girls regarding the control of emotions, responsibility for

Table 3 Multivariate models of associations between changes in response styles and changes in depressive symptoms in girls by age cohort

Multivariate model	Covariances β				Difference in constraints	Overall fit satorra scaled χ^2	Difference in overall fit
	DS intercept (D5)		DS slope (D6)				
Response styles separately	RU intercept (D1)	DI intercept (D3)	RU slope (D2)	DI slope (D4)	D1–D5: $\chi^2 = 1.947$, $p = .163$	$\chi^2(83, N = 663) = 114.00$, $p = .014$,	$\Delta\chi^2 = 26.64$, $\Delta df = 25$
Constrained	.47*	−.33*	.45*	−.51*	D3–D5: $\chi^2 = .000$, $p = .984$	$\chi^2/df = 1.37$, CFI = .964	$p = .374$, ΔCFI = .003
Unconstrained					D2–D6: $\chi^2 = .590$, $p = .443$	$\chi^2(58, N = 663) = 87.36$, $p = .007$,	
12–13 years old	.55*	−.28*	.48	−.55	D4–D6: $\chi^2 = .007$, $p = .935$	$\chi^2/df = 1.51$, CFI = .961	
14–15 years old	.38*	−.36*	.44	−.50			
Ratio score	RA intercept (D7)		RA slope (D8)		D7–D5: $\chi^2 = .180$, $p = .671$	$\chi^2(38, N = 663) = 53.91$, $p = .045$,	$\Delta\chi^2 = 13.46$, $\Delta df = 16$
Constrained	.57*		.60*		D8–D6: $\chi^2 = 1.496$, $p = .221$	$\chi^2/df = 1.42$, CFI = .959,	$p = .639$, ΔCFI = .005
Unconstrained						$\chi^2(22, N = 663) = 40.45$, $p = .010$,	
12–13 years old	.59*		.33			$\chi^2/df = 1.84$, CFI = .954	
14–15 years old	.54*		.77*				

Study variables and covariances: *DS* depressive symptoms, *RU* rumination, *DI* distraction, *RA* ratio score, *D1–D5* covariance between the intercept of rumination and the intercept of depressive symptoms, *D3–D5* covariance between the intercept of distraction and the intercept of depressive symptoms, *D2–D6* covariance between the slope of rumination and the slope of depressive symptoms, *D4–D6* covariance between the slope of distraction and the slope of depressive symptoms, *D7–D5* covariance between the intercept of the ratio and the intercept of depressive symptoms, *D8–D6* covariance between the slope of the ratio and the slope of depressive symptoms

* Statistically significant at level $p < .05$

the emotional tone of relationships, and mastery over negative events (Nolen-Hoeksema and Jackson 2001).

The second aim of the study was to investigate the relationships between changes in response styles and changes in depressive symptoms during mid-adolescence. A multivariate latent growth curve model indicated that the increase in the rumination response and the decrease in distraction were interrelated with an increase in depressive symptoms in adolescent girls. These longitudinal associations between rumination and depressive symptoms after a 2-year follow-up are consistent with the conclusions presented by Abela and Hankin (2011), who have demonstrated that after a 2-year follow-up, rumination is a predictor of depressive symptoms; however, they did not report any gender moderation. The association between rumination and adolescent depressive symptoms identified in girls is consistent with our fifth hypothesis and with the findings of Hilt et al. (2010), who indicated that girls reported more rumination than boys and that these increased scores accounted for their increased depressive symptoms, providing empirical evidence for the Response Styles Theory (Nolen-Hoeksema 2012). However, the present study also provides novel findings because no study to date has demonstrated that the decrease in distraction was also correlated with the increase in depressive symptoms in adolescent girls, which is consistent with our sixth hypothesis. Only Abela et al. (2007) concluded that the tendency to prospectively distract predicted decreases in depressive symptoms; however, no gender differences were identified. Thus, in addition to gender differences in the rumination response, the decreased use of distractions to increase an individual's own mood was also longitudinally associated with more depressive symptoms after a follow-up in adolescent girls. A second model indicated that the increased use of rumination compared with distraction was also associated with the increase in depressive symptoms in the subsample of girls. The prospective relationship of this ratio score with depressive symptoms is consistent with our seventh hypothesis and with Abela et al. (2007); however, we only identified this association in girls, whereas Abela et al. did not identify a gender difference.

This study provides longitudinal empirical evidence that supports the Response Styles Theory in a sample of Spanish adolescents and confirms our eighth hypothesis regarding a gender moderation effect in prospective associations between response styles and depressive symptoms. Our results in Spanish adolescents are partially consistent with the evidence reported to date in central European and North American samples.

Specifically, our study demonstrated that boys became distracted in the presence of negative affect more frequently than girls and that this distraction response decreased during mid-adolescence in girls. Moreover, the decrease in distraction was associated with an increase in depressive symptoms in adolescent girls. This finding indicates that gender differences are present in both response styles, which was originally proposed by Nolen-Hoeksema (1991), and not in ruminative responses exclusively. Furthermore, a confirmatory model was developed in girls that integrated the change in depressive symptoms during mid-adolescence with the change in both response styles. The results of this model indicated that the increase in depressive symptoms in adolescent girls is associated with changes in both response styles, rumination and distraction.

Several proposed mechanisms may explain the relationships between response styles and depressive symptoms. According to Nolen-Hoeksema et al. (2008), rumination leads to thinking more negatively about the past, the present and the future; interferes with good problem solving by appraising the problems as overwhelming and unsolvable; reduces motivation to initiate instrumental behavior; and reduces social support. Rumination is also hypothesized to lead to executive function difficulties in depressed patients, consistent with the resource allocation hypothesis (Levens et al. 2009). Research suggests that rumination is associated with memory control deficits for emotional information (Fawcett et al. 2015; Romero et al. 2014) and with a sustained attentional processing of negative information (Duque et al. 2014; Ferrari et al. 2016; Wagner et al. 2015). Interestingly, Watkins and Brown (2002) found that inducing rumination in depressed patients led to a failure of inhibitory executive control in a random number generation task, whereas inducing a distraction did not. Moreover, Whitmer and Gotlib (2012) concluded that rumination impairs the ability of depressed individuals to switch attention between tasks. Finally, Connolly et al. (2014) recently demonstrated that adolescents who habitually engaged in ruminative thoughts presented decreases in selective attention and attentional switching accuracy scores after a 15-month-follow-up period, which suggests that these detrimental effects on executive functioning may be the mechanism through which ruminative responses to negative affect lead to adolescent depressive symptoms.

Despite the number of contributions reported, several limitations of the study should also be acknowledged. A longitudinal design does not enable the establishment of causal relationships between variables; however, this design does provide an idea of the pattern of change and the associations between the rates of change. A multivariate latent growth model provides results on the bidirectional associations between the slopes or rates of changes and between the intercept or initial values in each assessment; however, we cannot draw conclusions regarding the directionality or causal relationships between the study variables. Another limitation refers to the administration of brief scales and not complete instruments; however, all the instruments exhibited good psychometric properties in the current and in previous studies. Kovacs (1992) demonstrated that a self-report measure of depressive symptoms was significantly correlated with a clinician-rated diagnosis and exhibited good psychometric properties. An assessment of pubertal development is also needed to control for its influence in emotional development, as indicated by recent research on the relationships of pubertal timing and tempo with the developmental course of depression from early to late adolescence in girls (Keenan et al. 2014). Moreover, other variables may account for gender differences in response styles and depressive symptoms during adolescence and need to be controlled in future research. For example, girls experience a greater exposure to peer stress than boys during middle school, both in the form of friendship stress and social network stress (Rose and Rudolph 2006). A final limitation may be derived from the high attrition rate because the older adolescents were more likely to not complete the third assessment, and the results indicated that the adolescents who abandoned the study exhibited more depressive symptoms.

The conclusions highlight the need to implement programs to prevent depression in adolescence or promote well-being and healthy coping strategies, with particular attention to adolescent girls (Garber et al. 2012). Thus, the design of interventions could focus on the promotion of adaptive response styles in adolescent girls, in addition to addressing cases in which the ruminative style has already developed. Interventions could focus on reducing the tendency to ruminate on negative emotions and on developing distractions to improve the emotional state by implementing evidence-based psychological techniques, such as cognitive, metacognitive or behavioral interventions (McMillan and Fisher 2004; Purdon 2004; Wells and Papageorgiou 2004). Hilt and Pollak (2012) tested three brief interventions to develop strategies to help adolescents disengage from ruminative states. This study demonstrated that both distraction and mindfulness may be helpful in terminating rumination in the short term; however, the brief problem-solving intervention was not effective. Both universal and girl-focused interventions may be particularly suitable in an educational framework because schooling is compulsory for children and adolescents and they spend several hours per day in school. Moreover, appropriate conditions for program implementation may be achieved in the educational environment (Duong et al. 2016; Seligman et al. 2009). The Penn Resiliency Program

has been demonstrated to be effective in reducing depressive symptoms in adolescents and has conducted numerous school-based controlled studies with more than 2000 children and adolescents between 8 and 15 years old (Gillham et al. 2007; Gillham and Chaplin 2011). Therefore, the identification of the critical period in which ruminative processes appear and confer special vulnerability to depressive symptom development may facilitate the effectiveness of these interventions in girls. The promotion of an adaptive response style such as distraction in girls may also be a helpful strategy to prevent depressive disorders during adolescence.

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Compliance with Ethical Standards

Conflict of Interest Diego Gomez-Baya, Ramon Mendoza, Susana Paino, Alvaro Sanchez, and Nuria Romero declare that they have no conflict of interest.

Ethical Approval All procedures that involved human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its subsequent amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Animal Rights No animal studies were carried out by the authors for this article.

References

Abela, J. R., Aydin, C. M., & Auerbach, R. P. (2007). Responses to depression in children: Reconceptualizing the relation among response styles. *Journal of Abnormal Child Psychology, 35*(6), 913–927. doi:10.1007/s10802-007-9143-2.

Abela, J. R., Brozina, K., & Haigh, E. P. (2002). An examination of the response styles theory of depression in third-and seventh-grade children: A short-term longitudinal study. *Journal of Abnormal Child Psychology, 30*(5), 515–527. doi:10.1023/A:1019873015594.

Abela, J. R., & Hankin, B. L. (2008). Cognitive vulnerability to depression in children and adolescents: A developmental psychopathology perspective. In J. R. Abela & B. L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 35–78). New York, NY: Guilford Press.

Abela, J. R., & Hankin, B. L. (2011). Rumination as a vulnerability factor to depression during the transition from early to middle adolescence: A multiwave longitudinal study. *Journal of Abnormal Psychology, 120*(2), 259. doi:10.1037/a0022796.

Allen, N. B., & Sheeber, L. B. (2008). *Adolescent emotional development and the emergence of depressive disorders*. Cambridge: Cambridge University Press.

Allgaier, A. K., Frühe, B., Pietsch, K., Saravo, B., Baethmann, M., & Schulte-Körne, G. (2012). Is the children's depression inventory short version a valid screening tool in pediatric care? A comparison to its full-length version. *Journal of Psychosomatic Research, 73*(5), 369–374. doi:10.1016/j.jpsychores.2012.08.016.

Bollen, K. A., & Curran, P. J. (2006). *Latent curve models. A structural equation perspective*. New York, NY: Wiley.

Braet, C., Theuwis, L., Van Durme, K., Vandewalle, J., Vandevivere, E., Wante, L., et al. (2014). Emotion regulation in children with emotional problems. *Cognitive Therapy and Research, 38*(5), 493–504. doi:10.1007/s10608-014-9616-x.

Broderick, P. C., & Korteland, C. (2004). A prospective study of rumination and depression in early adolescence. *Clinical Child Psychology and Psychiatry, 9*(3), 383–394. doi:10.1177/1359104504043920.

Bryant, F. B., & Satorra, A. (2012). Principles and practice of scaled difference Chi square testing. *Structural Equation Modeling, 19*(3), 372–398. doi:10.1080/10705511.2012.687671.

Burwell, R. A., & Shirk, S. R. (2007). Subtypes of rumination in adolescence: Associations between brooding, reflection, depressive symptoms, and coping. *Journal of Clinical Child and Adolescent Psychology, 36*(1), 56–65. doi:10.1080/15374410709336568.

Byrne, B. M. (2013). *Structural equation modeling with EQS: Basic concepts, applications, and programming*. New York, NY: Routledge.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. doi:10.1207/S15328007SEM0902_5.

Cicchetti, D., & Toth, S. L. (2012). A developmental psychopathology perspective on adolescent depression. In S. Nolen-Hoeksema & L. M. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 3–32). New York, NY: Routledge.

Connolly, S. L., Wagner, C. A., Shapero, B. G., Pendergast, L. L., Abramson, L. Y., & Alloy, L. B. (2014). Rumination prospectively predicts executive functioning impairments in adolescents. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(1), 46–56. doi:10.1016/j.jbtep.2013.07.009.

Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*(8), 837–844. doi:10.1001/archpsyc.60.8.837.

Deković, M., Buist, K. L., & Reitz, E. (2004). Stability and changes in problem behavior during adolescence: Latent growth analysis. *Journal of Youth and Adolescence, 33*(1), 1–12. doi:10.1023/A:1027305312204.

Del Barrio, O., Roa, L., Olmedo, M., & Colodron, F. (2002). Primera adaptacion del CDI-s a poblacion espanola [first adaptation of the CDI-s to the Spanish population]. *Accion Psicologica [Psychological Action], 3*(3), 263–272. doi:10.5944/ap.1.3.558.

Duncan, T. E., & Duncan, S. C. (2009). The ABC's of LGM: An introductory guide to latent variable growth curve modeling. *Social and Personality Psychology Compass, 3*(6), 979–991. doi:10.1111/j.1751-9004.2009.00224.x.

Duncan, T. E., Duncan, S. C., & Strycker, L. A. (2013). *An introduction to latent variable growth curve modeling: Concepts, issues, and application*. New York, NY: Routledge Academic.

Duong, M. T., Kelly, B. M., Haaland, W. L., Matsumiya, B., Huey, S. J., Jr., & McCarty, C. A. (2016). Mediators and moderators of a school-based cognitive-behavioral depression prevention program. *Cognitive Therapy and Research,*. doi:10.1007/s10608-016-9780-2.

Duque, A., Sanchez, A., & Vazquez, C. (2014). Gaze-fixation and pupil dilation in the processing of emotional faces: The role of

rumination. *Cognition and Emotion, 28*(8), 1347–1366. doi:10.1080/02699931.2014.881327.

Escriba Quijada, R., Maestre Montoya, C., Amores Laserna, P., Pastor Toledo, A., Miralles Marco, E., & Escobar Rabadan, F. (2005). Prevalencia de depresión en adolescentes [Prevalence of depression in adolescents]. *Actas Españolas de Psiquiatria [Spanish Psychiatry Reports], 33*(5), 298–302.

Essau, C. A., & Chang, W. C. (2009). Epidemiology, comorbidity, and course of adolescent depression. In C. A. Essau (Ed.), *Treatments for adolescent depression. Theory and practice* (pp. 3–25). Oxford, UK: Oxford University Press.

Extremera, N., & Fernandez-Berrocal, P. (2006). Validity and reliability of Spanish versions of the Ruminative Scale-short form and the Distraction Response Scale-short form in a sample of Spanish high school and college students. *Psychological Reports, 98*, 141–150. doi:10.2466/pr0.98.1.141-150.

Fawcett, J. M., Benoit, R. G., Gagnepain, P., Salman, A., Bartholdy, S., Bradley, C., et al. (2015). The origins of repetitive thought in rumination: Separating cognitive style from deficits in inhibitory control over memory. *Journal of Behavior Therapy and Experimental Psychiatry, 47*, 1–8. doi:10.1016/j.jbtep.2014.10.009.

Ferrari, G. R., Möbius, M., Opdorp, A., Becker, E. S., & Rinck, M. (2016). Can't look away: An Eye-tracking based attentional disengagement training for depression. *Cognitive Therapy and Research,*. doi:10.1007/s10608-016-9766-0.

Garber, J. (2007). Depression in youth: A developmental psychopathology perspective. In A. S. Masten (Ed.), *Multilevel dynamics in developmental psychopathology. Pathways to the future* (pp. 181–242). Mahwah, NJ: Lawrence Erlbaum Associates.

Garber, J., Webb, C. A., & Horowitz, J. L. (2012). Prevention of depression in adolescents: A review of selective and indicated programs. In S. Nolen-Hoeksema & L. M. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 619–660). New York, NY: Routledge.

Gillham, J. E., & Chaplin, T. M. (2011). Preventing girls' depression during the transition to adolescence. In T. J. Strauman, P. R. Costanzo, & J. Garber (Eds.), *Depression in adolescent girls: Science and prevention* (pp. 275–317). New York, NY: The Guilford Press.

Gillham, J. E., Reivich, K. J., Freres, D. R., Chaplin, T. M., Shatté, A. J., Samuels, B., et al. (2007). School-based prevention of depressive symptoms: A randomized controlled study of the effectiveness and specificity of the Penn Resiliency Program. *Journal of Consulting and Clinical Psychology, 75*(1), 9–19. doi:10.1037/0022-006X.75.1.9.

Gomez-Baya, D. (2014). *Predictors of life satisfaction and depressive symptoms in adolescence* (Doctoral dissertation, University of Huelva, Spain). Retrieved from http://rabida.uhu.es/dspace/handle/10272/7981.

Hankin, B. L. (2008). Rumination and depression in adolescence: Investigating symptom specificity in a multiwave prospective study. *Journal of Clinical Child and Adolescent Psychology, 37*(4), 701–713. doi:10.1080/15374410802359627.

Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin, 127*, 773–796. doi:10.1037//0033-2909.127.6.773.

Hilt, L. M., McLaughlin, K. A., & Nolen-Hoeksema, S. (2010). Examination of the response styles theory in a community sample of young adolescents. *Journal of Abnormal Child Psychology, 38*(4), 545–556. doi:10.1007/s10802-009-9384-3.

Hilt, L. M., & Nolen-Hoeksema, S. (2008). The emergence of gender differences in depression in adolescence. In S. Nolen-Hoeksema & L. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 111–135). New York, NY: Routledge.

Hilt, L. M., & Pollak, S. D. (2012). Getting out of rumination: comparison of three brief interventions in a sample of youth. *Journal of Abnormal Child Psychology, 40*(7), 1157–1165. doi:10.1007/s10802-012-9638-3.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. doi:10.1080/10705519909540118.

IBM Corp. (2012). *IBM SPSS statistics for windows, Version 21.0*. Armonk, NY: IBM Corp.

Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences, 55*(4), 367–374. doi:10.1016/j.paid.2013.03.019.

Keenan, K., Culbert, K. M., Grimm, K. J., Hipwell, A. E., & Stepp, S. D. (2014). Timing and tempo: Exploring the complex association between pubertal development and depression in African American and European American girls. *Journal of Abnormal Psychology, 123*(4), 725–736. doi:10.1037/a0038003.

Kline, R. B. (1998). *Principles and practice of structural equation modelling*. New York: Guilford.

Kovacs, M. (1992). *The children's depression inventory manual*. New York: Multi-Health Systems.

Kristman, V. L., Manno, M., & Côté, P. (2005). Methods to account for attrition in longitudinal data: do they work? A simulation study. *European Journal of Epidemiology, 20*(8), 657–662. doi:10.1007/s10654-005-7919-7.

Levens, S. M., Muhtadie, L., & Gotlib, I. H. (2009). Rumination and impaired resource allocation in depression. *Journal of Abnormal Psychology, 118*(4), 757–766. doi:10.1037/a0017206.

Lewinsohn, P. M., & Essau, C. A. (2002). Depression in adolescents. In C. L. Hammen & I. H. Gotlib (Eds.), *Handbook of depression* (pp. 541–559). New York, NY: Guilford Press.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198–1202. doi:10.1080/01621459.1988.10478722.

Marmorstein, N. R. (2010). Longitudinal associations between depressive symptoms and alcohol problems: The influence of comorbid delinquent behavior. *Addictive Behaviors, 35*(6), 564–571. doi:10.1016/j.addbeh.2010.01.004.

McMillan, D., & Fisher, P. (2004). Cognitive therapy for depressive thinking. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 241–258). West Sussex: Wiley.

Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., et al. (2010). Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry, 49*(10), 980–989. doi:10.1016/j.jaac.2010.05.017.

Muris, P., Fokke, M., & Kwik, D. (2009). The ruminative response style in adolescents: An examination of its specific link to symptoms of depression. *Cognitive Therapy and Research, 33*(1), 21–32. doi:10.1007/s10608-007-9120-7.

Nock, M. K., Green, J. G., Hwang, I., McLaughlin, K. A., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: Results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry, 70*(3), 300–310. doi:10.1001/2013.jamapsychiatry.55.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*(4), 569–582. doi:10.1037/0021-843X.100.4.569.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of*

Abnormal Psychology, 109(3), 504–511. doi:10.1037/10021-843X.109.3.504.

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual Review of Clinical Psychology, 8*, 161–187. doi:10.1146/annurev-clinpsy-032511-143109.

Nolen-Hoeksema, S., & Jackson, B. (2001). Mediators of the gender difference in rumination. *Psychology of Women Quarterly, 25*(1), 37–47. doi:10.1111/1471-6402.00005.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*(5), 400–424. doi:10.1111/j.1745-6924.2008.00088.x.

Ogden, T., & Hagen, K. A. (2013). *Adolescent mental health: Prevention and intervention*. New York, NY: Routledge.

Papadakis, A. A., Prince, R. P., Jones, N. P., & Strauman, T. J. (2006). Self-regulation, rumination, and vulnerability to depression in adolescent girls. *Development and Psychopathology, 18*(3), 815–829. doi:10.1017/S0954579406060408.

Preacher, K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (2008). *Latent growth curve modeling*. Thousand Oaks, CA: Sage.

Purdon, C. (2004). Psychological treatment of rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 217–240). West Sussex: Wiley.

Ravens-Sieberer, U., Wille, D. P. N., Erhart, M., Bettge, S., Wittchen, H. U., Rothenberger, A., et al. (2008). Prevalence of mental health problems among children and adolescents in Germany: Results of the BELLA study within the National Health Interview and Examination Survey. *European Child and Adolescent Psychiatry, 17*(1), 22–33. doi:10.1007/s00787-008-1003-2.

Reitz, E., Prinzie, P., Deković, M., & Buist, K. L. (2007). The role of peer contacts in the relationship between parental knowledge and adolescents' externalizing behaviors: A latent growth curve modeling approach. *Journal of Youth and Adolescence, 36*(5), 623–634. doi:10.1007/s10964-006-9150-6.

Roelofs, J., Rood, L., Meesters, C., Te Dorsthorst, V., Bögels, S., Alloy, L. B., et al. (2009). The influence of rumination and distraction on depressed and anxious mood: A prospective examination of the response styles theory in children and adolescents. *European Child and Adolescent Psychiatry, 18*(10), 635–642. doi:10.1007/s00787-009-0026-7.

Romero, N., Vazquez, C., & Sanchez, A. (2014). Rumination and specificity of autobiographical memory in dysphoria. *Memory, 22*(6), 646–654. doi:10.1080/09658211.2013.811254.

Rood, L., Roelofs, J., Bögels, S. M., Nolen-Hoeksema, S., & Schouten, E. (2009). The influence of emotion-focused rumination and distraction on depressive symptoms in non-clinical youth: A meta-analytic review. *Clinical Psychology Review, 29*(7), 607–616. doi:10.1016/j.cpr.2009.07.001.

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*(1), 98–131. doi:10.1037/0033-2909.132.1.98.

Schwartz, J. A., & Koenig, L. J. (1996). Response styles and negative affect among adolescents. *Cognitive Therapy and Research, 20*(1), 13–36. doi:10.1007/BF02229241.

Seligman, M. E., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford Review of Education, 35*(3), 293–311. doi:10.1080/03054980902934563.

Strauman, T. J., Costanzo, P. R., & Garber, J. (Eds.). (2011). *Depression in adolescent girls: Science and prevention*. New York, NY: Guilford Press.

Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27*(3), 247–259. doi:10.1023/A:1023910315561.

Wagner, C. A., Alloy, L. B., & Abramson, L. Y. (2015). Trait rumination, depression, and executive functions in early adolescence. *Journal of Youth and Adolescence, 44*(1), 18–36. doi:10.1007/s10964-014-0133-8.

Watkins, E., & Brown, R. G. (2002). Rumination and executive function in depression: An experimental study. *Journal of Neurology, Neurosurgery and Psychiatry, 72*(3), 400–402. doi:10.1136/jnnp.72.3.400.

Weissman, M. M., Wolk, S., Goldstein, R. B., Moreau, D., Adams, P., Greenwald, S., et al. (1999). Depressed adolescents grown up. *Journal of the American Medical Association, 281*, 1707–1713. doi:10.1001/jama.281.18.1707.

Wells, A., & Papageorgiou, C. (2004). Metacognitive therapy for depressive rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 259–274). West Sussex: Wiley.

Whitmer, A. J., & Gotlib, I. H. (2012). Switching and backward inhibition in major depressive disorder: The role of rumination. *Journal of Abnormal Psychology, 121*(3), 570–578. doi:10.1037/a0027474.

Yoder, J. D., & Lawrence, C. L. (2011). Are gender differences in self-reported rumination explained by women's stereotyping? *Sex roles, 65*(1–2), 94–101. doi:10.1007/s11199-010-9913-0.

Ziegert, D. I., & Kistner, J. A. (2002). Response styles theory: Downward extension to children. *Journal of Clinical Child and Adolescent Psychology, 31*(3), 325–334. doi:10.1207/S15374424JCCP3103_04.