

Latent Growth Curve Model of Perceived Family Relationship Quality and Depressive Symptoms During Middle Adolescence in Spain

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Abstract

This study aimed to examine longitudinal associations between the perceived quality of family relationships and self-reported depressive symptoms during middle adolescence. A 2-year follow-up study, with three assessments at 1-year intervals, was conducted. A total of 525 Spanish adolescents completed paper-based self-report assessments, which included the 10-item Child Depression Inventory and a brief Likert-type scale to measure the quality of the relationships with their father and their mother separately. The results indicated that a decline in the quality of both adolescent–father and adolescent–mother relationships were related to an increase in depressive symptoms during middle adolescence. Furthermore, adolescent–father relationships were found to be worse for girls than for boys and were observed to be associated with gender differences in depressive symptoms after the follow-up. The results provide longitudinal evidence on the importance of parent–adolescent relationships and gender differences in depressive symptoms during adolescence.

Keywords

family, parent–adolescent relationship, depression, adolescence, longitudinal

During adolescence, there is a heightened risk for the emergence of depressive disorders (Abela & Hankin, 2008). Epidemiological research has consistently found a marked increase in the presence of depression during adolescence in modern society (Ogden & Hagen, 2013). In the United States, around 14% of adolescents between 13 and 18 years old reported depressive disorders (Merikangas et al., 2010). In Europe, approximately 11% of German teenagers between 11 and 17 years old were found to suffer from significant depressive symptoms (Ravens-Sieberer et al., 2008), whereas among Spanish adolescents, this percentage was found to be 10.3% (Escriba Quijada et al., 2005). Some prospective community-based studies have revealed an increase in the rates of clinical depression from childhood to late adolescence (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003), and it seems that the peak age for the onset of depression occurs during middle adolescence, from approximately 13 to 15 years old (Lewinsohn & Essau, 2002). Additionally, the literature has consistently shown that the gender differences in the risk for depression first emerge during the adolescent years (Strauman, Costanzo, & Garber, 2011). While there are no differences before adolescence, the presence of depressive symptoms and disorders among adolescent girls increases significantly, while the rates among boys remain relatively stable (Hilt & Nolen-Hoeksema, 2008). The dramatic impact of depression during adolescent development highlights the importance of studying when this disorder emerges and what factors explain its development, maintenance, or severity (Merikangas & Knight, 2008).

Despite the growing role of peer relationships during adolescence, family processes maintain a key role in the development of adolescents' emotional health (Ackard, Neumark-Sztainer, Story, & Perry, 2006; Hair, Moore, Garrett, Ling, & Cleveland, 2008). Some studies have paid special attention to changes in parent–child conflicts, closeness, perceived support, and ease of communication during adolescence (Steinberg & Morris, 2001). Adolescence is an important life stage for the negotiation of changes in autonomy in the parent–adolescent relationship (Steinberg, 2001). The last report of the health behavior of school-aged children (HBSC) study (Inchley & Currie, 2016), carried out in

2013 and 2014 in 44 countries in Europe and North America, indicated significant age-related differences in communication with mothers; 11-year-old boys and girls reported greater ease of communication with their mother than 15-year-old boys and girls. Regarding the ease of communication with fathers, age and gender differences were also found. Ease of father-adolescent communication decreased with age for both genders, whereas boys at all ages and in all countries reported greater ease of communication with their father than girls. This international study also evaluated perceived family support and detected that 15-year-old adolescents perceived less family support than the younger cohort. In this line, previous studies have reported a decline in closeness, in the amount of time spent with parents, in the feeling of companionship and intimacy with parents, in the perceived acceptance by parents, and in the expression of warmth and positive emotions, as well as an increase in mild conflict, according to a review by Laursen and Collins (2009). These data are also consistent with research on changes in the quality of parent-adolescent relationships from childhood to adolescence and from adolescence to emerging adulthood (Parra, Oliva, & Reina, 2015; Shearer, Crouter, & McHale, 2005).

Considerable research has focused on the importance of parent-adolescent relationships in emotional development. A review by Morris, Silk, Steinberg, Myers, and Robinson (2007) concluded that adolescents' emotion regulation is affected by the emotional climate of the family via parenting style, the attachment relationship, family expressiveness, and parents' marital relationship. Parental communication constitutes an important resource for resilience in order to help adolescents manage stressful situations and buffer them against adverse influences (Brooks et al., 2015). Better communication with parents was found to be related with fewer psychological complaints among adolescents from 35 countries in the HBSC study (Moreno et al., 2009). The impact of father-adolescent relationships and mother-adolescent relationships on emotional well-being has been also studied (Allen & Sheeber, 2009). Videon (2005) noted that adolescents' relationships with both their mother and their father are important for psychological well-being, and Sheeber, Davis, Leve, Hops, and Tildesley (2007) indicated that a negative adolescent-father relationship was associated with depressive symptomatology in same way that a negative adolescent-mother relationship was. Additionally, studies regarding parental depression have highlighted that depression in both fathers and mothers was related to depressive symptoms in adolescents (Cummings, Keller, & Davies, 2005; Goodman & Gotlib, 1999).

Some research has paid special attention to adolescent depression as a consequence of troubled relationships with parents. Schwartz, Dudgeon, et al. (2012), in a longitudinal study conducted in Australia, showed that higher levels of parental aggression prospectively predicted more depressive symptoms in adolescents over 2.5 years, whereas more positive parental behaviors were prospectively associated with fewer depressive symptoms. Branje, Hale, Frijns, and Meeus (2010) indicated that, in a sample of adolescents from the Netherlands, the quality of the relationship with their mother predicted depression in both boys and girls, but the father–adolescent relationship predicted depression only in boys. These authors also detected a bidirectional path, showing that depressive symptoms predicted worse relationships with parents. Boutelle, Eisenberg, Gregory, and Neumark-Sztainer (2009) also provided empirical support to the reciprocal associations between parent–child connectedness and adolescent emotional functioning over 5 years. Furthermore, gender differences in the patterns of the relationships between family interactions and depressive symptoms have been detected. Communication between adolescents and their father seems to vary by gender, and these difficulties appear to be more strongly related to internalizing problems for girls than for boys (Demidenko, Manion, & Lee, 2015). In a study of Croatian adolescents, depressive symptoms in girls were more closely linked to a lack of protective family factors, whereas depressive symptoms in boys were more closely linked to the existence of harmful family factors (Smojver-Ažić & Bezinović, 2011). A meta-analysis by Kane and Garber (2004) highlighted gender differences in the association between paternal mental health, the father–adolescent relationship, and certain adolescent mental health outcomes. In this line, Reeb and Conger (2009) indicated that girls reporting low closeness with their father were more vulnerable than boys to the negative effects of paternal depressive symptoms on their own psychological adjustment.

Although numerous studies have been conducted to analyze the associations among different aspects of parent–adolescent relationships and depression, few works to date have carried out multiple assessment during a follow-up period longer than 1 year in middle adolescence. Moreover, most studies have focused on few characteristics in the nature of the parent–adolescent relationship. Research is needed to integrate different aspects into one brief measure, such as perceived support, ease of communication, expressions of affection, received care, and perceived warmth, which have been examined in previous literature on family relationships and psychological adjustment in adolescence

(Jacobson & Crockett, 2000; Moreno et al., 2009; Needham, 2008; Operario, Tschann, Flores, & Bridges, 2006; Sheeber, Hops, & Davis, 2001; Stein et al., 2000). Closer analysis is also needed to examine the prospective effect of the quality of the relationship with the mother and with the father separately on adolescent depressive symptoms (Branje et al., 2010; Sheeber et al., 2001). Furthermore, very few studies have jointly analyzed the associations between gender differences in the reported quality of the relationships with the father and the mother and gender differences in depressive symptoms. Importantly, it is also necessary to further examine the associations among the rate of change in the perceived quality of the relationships with the father and mother and the rate of change in depressive symptoms within a confirmatory model. Both the changes in adolescents' perceptions of relationships with their parents (De Goede, Branje, & Meeus, 2009; Laursen & Collins, 2009; Steinberg, 2001) and the increase in depressive symptoms (Abela & Hankin, 2008; Costello et al., 2003) have been well supported by previous literature, but more research is needed that focuses on the relationships between these rates of change during middle adolescence (Restifo & Bögels, 2009; Sheeber et al., 2001). Finally, most research to date has explored the association between different aspects of parent–adolescent relationships and reported depressive symptoms in Anglo-Saxon countries, whereas little attention has been paid to samples in the south of Europe, such as Spain, where the Mediterranean family model confers special characteristics; for example, family connections and orientation are strong, and children live in the family home until well past the age of 20 years, generally leaving that home to live with a partner (Parra, Oliva, & Sánchez-Queija, 2015). Thus, the aims of this research work are (a) to explore changes in the perceived quality of adolescents' relationships with their father and mother and changes in depressive symptoms during middle adolescence, by gender, and (b) to examine the associations among the patterns of change in family relationships and depressive symptoms, taking into account gender differences. Regarding the first aim, we hypothesized that the perceived quality of the relationship with the mother and father decreases during middle adolescence and that depressive symptoms increase. Gender differences in the father–adolescent relationship and depressive symptoms were also expected, and girls were expected to have a worse relationship with their father and more depressive symptoms. Finally, regarding the second aim, we expected bidirectional prospective associations between perceived quality of family relationships and depressive symptoms. Thus, we hypothesized that the decrease in the perceived quality of father–

adolescent and mother–adolescent relationships are prospectively associated with an increase in depressive symptoms during middle adolescence.

Method

Overall Study Design and Data Collection Procedure

A longitudinal design was used with three assessment points at 1-year intervals, following the indications of Willett, Singer, and Martin (1998).

Therefore, 2 years separated the first and last assessments. A pencil-and-paper self-report was anonymously and individually completed by the participants at their own desks during normal class time. To track the participants, a code was created using the number of the school (1-18), their birth date, and their gender. Informed consent was obtained from all participants and their parents.

Participants

A nonclinical community sample of 525 Caucasian Spanish adolescents participated in the study (50.3% boys). They were aged between 12 and 15 years ($M = 13.45$, $SD = 0.69$) and enrolled in one of 18 secondary schools located in Andalusia (Spain) with different geographies (rural, semiurban, urban) and ownership types (public or private). Two classes were randomly selected in each secondary school. At the beginning of the study, the sample was composed of 934 adolescents, and around 78% of the sample remained involved at Time 2 ($n = 726$). Finally, up to 201 adolescents did not complete the final assessment, presenting an attrition rate of around 27.7%. Orphan participants were excluded for the analysis of parent–child relationships.

Instrument

Parent–Adolescent Relationships. A short version of the Questionnaire on the quality of parent–child relationships was administered (Ortega & Triana, 2002; Rodrigo et al., 2004). This version was composed of two subscales with five items each that separately assess the quality of the adolescent–mother relationship and the adolescent–father relationship. The construct of parent–child relationship quality included contents such as perceived warmth, ease of communication, perceived support, expression of affection, and received care. These contents are equivalent in the adolescent–father relationship and the adolescent–mother relationship. They are introduced by a general statement: “We

present a list of phrases that reflect different forms of relationships between parents and children below. Please read each of the sentences and indicate how often you experience what is expressed in each of them.” Each subscale consists of five statements, all formulated positively so that a higher frequency of the occurrences in each detailed statement indicates a better perceived relationship between the adolescent and his/her father or mother: “I feel good when I’m with my father/mother,” “I find it easy to talk to my father/mother,” “My father/mother encourages me and supports me,” “My father/mother shows me that he/she loves me (telling me so, hugging me, doing things to please me, for example),” and “My father/mother cares about me when I have problems.” To indicate the frequency, five response options are available, from “never” to “always.” The overall score on each subscale is calculated by adding the score on each of the five items (never = 1 and always = 5), so the final score ranges between 5 and 25. In addition, the scale offers the option “I have no father” or “I have no mother.”

A pilot study with a sample of 266 adolescents from three secondary schools revealed that both scales presented good psychometric properties, excellent factorial validity, and internal consistency reliability (for more details, see Gomez-Baya, 2014). In the present study, the scale of the quality of the relationship with the father (Time 1: $\alpha = .87$; Time 2: $\alpha = .90$; Time 3: $\alpha = .90$) and the quality of the relationship with the mother (Time 1: $\alpha = .85$; Time 2: $\alpha = .90$; Time 3: $\alpha = .89$) also presented notable internal consistency reliability. Regarding content validity, the contents of the scales (i.e., perceived support, ease of communication, expressions of affection, received care, and perceived warmth) received substantial empirical support in previous studies on perceived family functioning and psychological adjustment during adolescence (as mentioned above). Concerning construct validity, principal component analyses using varimax rotation indicated good factorial validity for each subscale in the first assessment. All indicators presented factor solutions more than .75 in one unique factor on the scale of the relationship with the father, KMO = .88, Bartlett $\chi^2(10, N = 525) = 1361.08, p < .001$, eigenvalue = 3.45, percentage of variance = 69.00, and on the scale of the relationship with the mother, KMO = .85, Bartlett $\chi^2(10, N = 525) = 1108.22, p < .001$, eigenvalue = 3.21, percentage of variance = 64.23. Then, confirmatory factor analyses (CFA) using maximum likelihood estimation tested the factorial structure of the two subscales at Time 1. Both the CFA of perceived quality of the relationship with the father, $\chi^2(4, N = 525) = 5.60, p = .231$, comparative fit index (CFI) = .99, root mean square error of approximation (RMSEA) =

.03, 90% confidence interval (CI) RMSEA [.00, .08], and the CFA of perceived quality of the relationship with the mother, $\chi^2(4, N = 4525) = 7.90, p = .095, CFI = .98, RMSEA = .04, 90\% CI RMSEA [.00, .09]$, presented a good data fit. For each separate subscale, all factor loadings of the indicators were significant at $p < .05$, presenting standardized solutions over .71. This good factorial validity was also observed in the second and third assessments for both subscales.

Depressive Symptoms. The Spanish short version of the Children's Depression Inventory (Del Barrio, Roa, Olmedo, & Colodron, 2002; Kovacs, 1992) was administered. This short scale with 10 items has shown good psychometric properties for assessing the presence and intensity of depressive symptomatology among child and adolescent populations in previous studies, and the validity of this instrument for research purposes in place of the longer version is well supported (Joormann, Talbot, & Gotlib, 2007; Kovacs, 1992). In this inventory, a cutoff ≥ 3 has been presented to indicate clinically relevant symptomatology, showing good diagnostic accuracy with a high sensitivity and specificity (Allgaier, Pietsch, Frühe, Sigl-Glöckner, & Schulte-Körne, 2012). This short scale presented a notable internal consistency reliability in this research, as measured with Cronbach's α ($\alpha = .73$ in Time 1, $\alpha = .74$ in Time 2, and $\alpha = .76$ in Time 3).

Data Analysis Design

An attrition analysis was conducted to compare differences in demographics and baseline scores between adolescents who participated in all time points of the study and adolescents who did not. Moreover, Little's test was performed to check that missing values were distributed completely at random in order to be able to carry out an imputation procedure. We used an α level of .05 for all statistical tests. Regarding the first aim, repeated-measures analyses of variance were performed to study changes in depressive symptoms and in responses to positive affect after the follow-up, controlling the effect of gender and age cohort on these changes. Moreover, it was examined whether the change in family relationships was affected by initial scores in depressive symptoms, comparing adolescents over and below the cutoff point of clinically significant depressive symptomatology at the beginning of the study. Regarding the second aim of this research, the relationships between the scores for depressive symptoms and family relationships were analyzed using bivariate Pearson correlations at each assessment. Next, a latent growth curve model was conducted with the program EQS 6.1, which assesses the model fit based on covariance matrices using the maximum likelihood estimation method

(Byrne, 2013). A latent growth curve model allows the estimation of the trajectory of growth or change in variables over time and an analysis of which variables might explain these changes or how the various trajectories of change might be associated (Bollen & Curran, 2006; Duncan, Duncan, & Strycker, 2013; Preacher, Wichman, MacCallum, & Briggs, 2008). First, the unconditional models of change in the relationship with the mother, in the relationship with the father, and in depressive symptoms were tested to identify which statistical model best described their trajectory. Each growth model was composed of two factors, intercept and slope, in which the three measures were included. The intercept represents the initial values of the variable, and since it is constant for each subject over time, the factor saturations given to each measurement have a value of 1. The slope factor describes the change over time. It was tested whether the slope was best described as linear (with factor saturations following a linear time scale, 0, 1, and 2) or nonlinear (only two factor saturations were set at 0 and 1, while the third one was freely estimated), according to procedure used by Reitz, Prinzie, Deković, and Buist (2007). Then, two multivariate latent growth models were tested to (a) explore the association between family relationships at Time 1 and the initial values and rate of change in depressive symptoms and (b) examine the associations among the initial values and the changes in family relationships and in depressive symptoms. Moreover, gender and age cohort effects were introduced in these multivariate models. Some global fit indexes were reported, following indications by Hu and Bentler (1999), and modifications in the models were conducted through the Lagrange multiplier test and the Wald test.

Results

Attrition Analysis and Imputation Procedure

Attrition analyses indicated that participants at the three time points of the study presented different baseline scores in depressive symptoms, $F(2, 856) = 7.98, p < .001, \eta^2 = .018$, and in the quality of the father–adolescent relationship, $F(2, 856) = 7.94, p < .001, \eta^2 = .018$. Bonferroni post hoc tests showed that participants at all three time points reported fewer depressive symptoms than participants at two time points ($MD = -.69, SE = .25, p = .018$) and participants of only the first assessment ($MD = -.89, SE = .25, p = .001$). Furthermore, participants at all three assessment time points presented better relationships with their father than adolescents who only participated in Time 1 ($MD = .30, SE = .08, p < .001$). No significant differences were detected in the mother–adolescent relationship,

$F(2, 856) = 1.84, p = .159$. Furthermore, the results indicated significant gender differences, $\chi^2(2, N = 934) = 8.26, p = .016$. Although the percentages of boys and girls were similar among participants at all three time points (50% boys and 49.78% girls) and at two time points (48.8% boys and 51.2% girls), there were important differences in the gender distribution among adolescents who were assessed only at Time 1 (61.1% boys and 38.9% girls). No differences were detected concerning the initial academic year, $\chi^2(2, N = 934) = 3.79, p = .150$.

In the final sample of participants with three evaluations, omissions were below 1% for each item. Little's test indicated that missing values were distributed completely at random, $\chi^2(8, N = 525) = 9.01, p = .341$, and a maximum likelihood imputation procedure, based on an expectation-maximization algorithm, was conducted to address missing values.

Table 1. Descriptive Statistics of Study Variables in Each Time, by Gender.

	Girls		Boys		Total	
	M	SD	M	SD	M	SD
Father-Adolescent Relationship Time 1	4.20	0.91	4.33	0.72	4.27	0.82
Father-Adolescent Relationship Time 2	3.99	0.97	4.12	0.93	4.05	0.95
Father-Adolescent Relationship Time 3	3.88	0.99	4.08	0.90	3.98	0.95
Mother-Adolescent Relationship Time 1	4.62	0.62	4.61	0.54	4.62	0.58
Mother-Adolescent Relationship Time 2	4.52	0.71	4.50	0.72	4.51	0.71
Mother-Adolescent Relationship Time 3	4.44	0.75	4.37	0.76	4.40	0.76
Depressive Symptoms Time 1	3.59	2.45	2.92	2.63	3.25	2.56
Depressive Symptoms Time 2	3.92	2.76	3.11	2.51	3.51	2.66
Depressive Symptoms Time 3	4.30	2.73	3.08	2.65	3.69	2.76

Change in Depressive Symptoms and Family Relationships, by Gender and Age Cohort

Table 1 describes the descriptive statistics of depressive symptoms, father-adolescent relationships, and mother-adolescent relationships at each assessment time and by gender. Repeated-measures variance analysis showed a significant linear increase in depressive symptoms from Time 1 to Time 3, $F(1, 524) = 12.83, p < .001, \eta^2 = .024$. There was also a significant interaction with gender, $F(1, 522) = 5.16, p = .024, \eta^2 p = .010$. Thus, the linear increase in depressive symptoms was especially remarkable in girls, $F(1, 260) = 16.33, p < .001, \eta^2 = .059$, while in boys, the increase was small and nonsignificant, $F(1, 263) = .93, p = .335$. Furthermore, gender presented a significant

intersubject effect, $F(1, 522) = 22.69, p < .001, \eta^2 = .042$. Girls reported more depressive symptoms than boys at each time point of the study. Regarding age cohort, no differences were detected, $F(1, 522) = .09, p = .761$, nor was an interaction with depressive symptoms change, $F(1, 522) = .20, p = .653$.

The perceived quality of the relationship with the father showed a linear decrease after the follow-up, $F(1, 524) = 73.47, p < .001, \eta^2p = .123$. No significant interactions with gender, $F(1, 522) = 1.05, p = .307$, or with age cohort, $F(1, 522) = 3.32, p = .069$, were found. Concerning intersubject effects, gender differences were found in the relationship with the father, $F(1, 522) = 4.91, p = .027, \eta^2 = .009$. Thus, boys reported a better relationship with their father than girls. No age cohort differences were detected in the quality of the father–adolescent relationship, $F(1, 522) = .55, p = .461$. Furthermore, the perceived quality of the relationship with the mother also experienced a significant linear decrease from Time 1 to Time 3, $F(1, 524) = 58.78, p < .001, \eta^2p = .101$. Gender did not present a significant interaction, $F(1, 522) = 1.51, p = .220$, or an intersubject effect, $F(1, 522) = .41, p = .523$. Regarding age cohort, a significant interaction with the change in the quality of the mother–adolescent relationship was found, $F(1, 522) = 12.23, p = .001, \eta^2 = .023$. Therefore, although the linear decrease was significant in each age cohort, the change was especially remarkable among 12-year-old adolescents, $F(1, 142) = 40.42, p < .001, MD = .43, \eta^2 = .222$, and the decrease was smaller among 14-year-old adolescents, $F(1, 123) = 10.65, p = .001, \text{mean difference} = .15, \eta^2 = .080$. However, no relevant differences among the age cohorts were detected for each assessment time, $F(1, 522) = .10, p = .758$.

The changes in parent–adolescent relationships were also studied by the initial depressive symptoms level, comparing changes in two groups created by the cutoff point of ≥ 3 . The results showed a decrease in the quality of father–adolescent relationships among both adolescents over the cutoff point in depressive symptoms, $F(1, 279) = 27.93, p = .001, \eta^2 = .091$, and adolescents under the cutoff point, $F(1, 244) = 57.43, p = .001, \eta^2 = .191$. The mean values of father–adolescent relationship quality decreased from 4.52 (SD = 0.57) at Time 1 to 4.23 (SD = 0.76) at Time 3 among adolescents with subclinical depressive symptoms score and from 4.05 (SD = 0.94) at Time 1 to 3.77 (SD = 1.05) at Time 2 among adolescents with clinical scores. At each assessment time point, adolescents with depressive symptoms scores over the cutoff reported worse relationships with their father than adolescents under that cutoff, $F(1, 523) = 46.94, p < .001, \eta^2 = .082$. Regarding

mother–adolescent relationships, the decreases were also significant for both adolescents under the cutoff, $F(1, 244) = 32.25, p < .001, \eta^2 = .117$, and those over the cutoff, $F(1, 279) = 6.38, p < .001, \eta^2 = .089$. The mean values of the perceived quality of the mother–adolescent relationship changed from 4.73 (SD = 0.43) at Time 1 to 4.51 (SD = 0.68) at Time 3 among adolescents under the cutoff, while the average decreased from 4.52 (SD = 0.67) at Time 1 to 4.31 (SD = 0.80) at Time 3 among adolescents who presented depressive symptoms over the cutoff. Thus, adolescents with clinically relevant depressive symptoms also reported worse relationships with their mother in each wave, $F(1, 523) = 16.20, p < .001, \eta^2 = .030$.

Bivariate Correlations

Table 2 shows bivariate Pearson correlations between the scores for depressive symptoms, father–adolescent relationships, and mother–adolescent relationships at each time point of this research. The results indicated that both the quality of the father–adolescent relationship and the quality of the mother–adolescent relationship were negatively associated with depressive symptoms at each time point. No gender differences were detected in this regard, as these associations were remarkable among both boys and girls. Moreover, the quality of the relationship with the father and the quality of the relationship with the mother were positively associated in all assessments. Finally, the scores of each variable at all assessment time points were positively related.

Table 2. Pearson Correlations Between Study Variables in Each Time.

	1	2	3	4	5	6	7	8	9
1. Father–Adolescent Relationship Time 1	1								
2. Father–Adolescent Relationship Time 2	.73*	1							
3. Father–Adolescent Relationship Time 3	.64*	.70*	1						
4. Mother–Adolescent Relationship Time 1	.47*	.29*	.19*	1					
5. Mother–Adolescent Relationship Time 2	.33*	.40*	.23*	.62*	1				
6. Mother–Adolescent Relationship Time 3	.30*	.29*	.44*	.56*	.68*	1			
7. Depressive Symptoms Time 1	-.40*	-.31*	-.28*	-.28*	-.20*	-.21*	1		
8. Depressive Symptoms Time 2	-.28*	-.37*	-.26*	-.18*	-.27*	-.21*	.55*	1	
9. Depressive Symptoms Time 3	-.31*	-.32*	-.33*	-.17*	-.22*	-.18*	.46*	.61*	1

* $p < .001$

Latent Growth Curve Analyses

Two latent growth models were tested. In the first one, we aimed to explain depressive symptoms at each time point and their rate of change, from the baseline scores in the relationships with the father and the mother, taking into account gender and age cohort

effects. First, an unconditional model of the change in depressive symptoms was developed. A model with two factors, representing intercept ($M = 3.27, \sigma^2 = 3.54$) and a linear slope ($M = 0.22, \sigma^2 = .50$), showed a good data fit, $\chi^2(2, N = 525) = 3.05, p = .218, CFI = .99, RMSEA = .03, 90\% \text{ CI RMSEA } [.00, .10]$; standardized residuals were between $-.1$ and $.1$, and the construct equations were both significant. Second, a model tested the effect on depressive symptoms' intercept and slope of gender and quality of the relationship with the father and the mother. A gender effect on the relationship with the father was also introduced, and both types of parent-child relationships were expected to be associated, according to previous results. This model presented a good overall fit to the data, $\chi^2(6, N = 525) = 9.48, p = .148, CFI = .99, RMSEA = .03, 90\% \text{ CI RMSEA } [.00, .07]$. The effects on the depressive symptoms slope of the relationships with the father ($\beta = .06, p > .05$) and the mother ($\beta = .13, p > .05$) were not significant, and the Wald test suggested deleting these effects in the model. The modified model revealed that (a) gender presented an effect on depressive symptoms' intercept and slope as well as on the relationship with the father at Time 1; (b) the relationships with both the father and the mother at Time 1 presented a negative effect on depressive symptoms' intercept; and (c) the relationships with the father and the mother at Time 1 were positively related. Thus, better relationships with both the father and the mother were associated with fewer depressive symptoms at each time point of the study. This model is represented in Figure 1, showing an excellent data fit, $\chi^2(8, N = 525) = 12.02, p = .150, CFI = .99, RMSEA = .03, 90\% \text{ CI RMSEA } [.00, .06]$, and all measurement and construct equations were significant. The standardized residuals were very short (between $-.1$ and $.1$). In this model, depressive symptoms' intercept was explained by gender and baseline scores in the relationships with the father and the mother with a variance of 25.9%. It was also remarkable that the effect of the adolescent-father relationship on depressive symptoms ($\beta = -.41, p < .001$) was stronger than the effect of the adolescent-mother relationship ($\beta = -.12, p < .001$).

The second latent growth curve model was performed to study the associations among the changes in the relationships with the mother and the father and the change in depressive symptoms. First, unconditional models of the change in the relationships with the father and the mother were developed. Regarding the relationship with the mother, an unconditional model with two factors, an intercept ($M = 4.62, \sigma^2 = .25$) and a linear slope ($M = -0.11, \sigma^2 = .06$), showed a good data fit, $\chi^2(2, N = 525) = .51, p = .776, CFI = .99,$

RMSEA = .01, 90% CI RMSEA [.00, .06]. Standardized residuals were between $-.1$ and $.1$, and construct equations of intercept and slope were both significant. The unconditional model of the relationship with the father also showed an intercept factor ($M = 4.26, \sigma^2 = .54$) and a linear slope factor ($M = -0.15, \sigma^2 = .05$) with a good data fit, $\chi^2(2, N = 525) = 5.16, p = .006, \chi^2/df = 2.58, CFI = .99, RMSEA = .07, 90\% CI RMSEA [.04, .11]$. Both construct equations were also significant, and the residuals were very low. After unconditional models were tested, a multivariate latent growth curve model was conducted, in which the intercepts of the father and mother relationships were related to depressive symptoms' intercept, the slopes of the father and mother relationships were related to depressive symptoms' slope, and the intercepts and slopes of mother and father relationships were associated. Moreover, gender was expected to present an effect on the intercepts of depressive symptoms and the adolescent–father relationship and on the slope of depressive symptoms. Age cohort was expected to have an effect on the adolescent–mother relationship slope, according to previous analysis of variance results. This model did not initially present a good data fit, $\chi^2(42, N = 525) = 181.77, p < .001, CFI = .89, RMSEA = .08, 90\% CI RMSEA [.07, .09]$, although all construct and measurement equations proved significant.

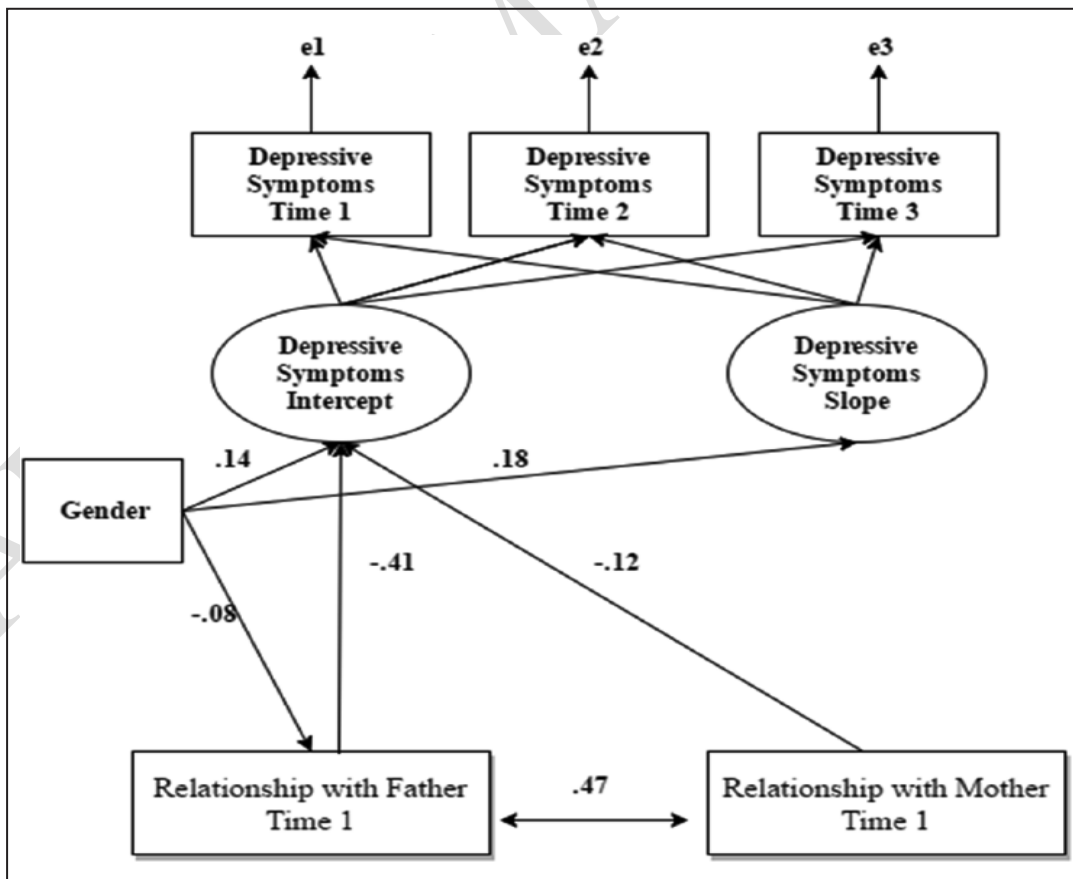


Figure 1. Latent growth curve model of the change in depressive symptoms in adolescents after the 2-year follow-up, by gender and initial perceived quality of the relationship with father and mother.

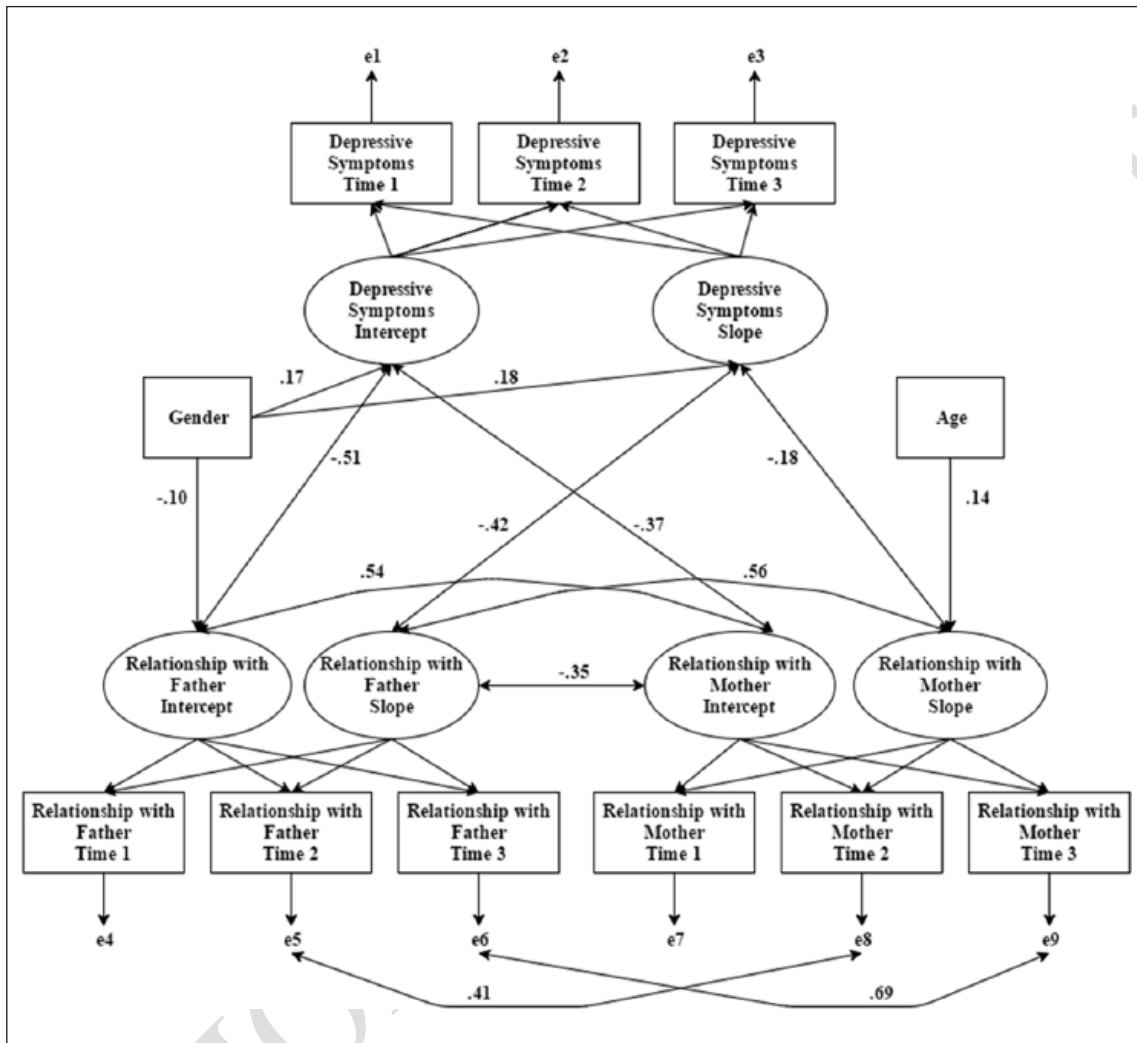


Figure 2. Latent growth curve model of the associations between the changes in the perceived quality of family relationships and the change in depressive symptoms after the 2-year follow-up.

The Lagrange multiplier test suggested adding some associations in the previous model, that is, an association between the adolescent-mother relationship intercept and the adolescent-father relationship slope and two associations between the measurement errors of father and mother relationships at Times 2 and 3, respectively. The final model is represented in Figure 2, and it showed a notable data fit, $\chi^2(39, N = 525) = 81.27, p < .001, \chi^2/df = 2.08, CFI = .97, RMSEA = .05, 90\% \text{ CI RMSEA } [.03, .06]$. Furthermore, standardized residuals were between $-.1$ and $.1$, and all construct and measurement

equations were significant. This multivariate latent growth model indicated that (a) the intercepts of adolescent–father and adolescent–mother relationships were negatively associated with the depressive symptoms intercept; (b) the slopes of adolescent–father and adolescent–mother relationships were negatively associated with the depressive symptoms slope; (c) the intercepts and the slopes of adolescent–father and adolescent–mother relationships were positively linked with one another; (d) the intercept of the adolescent–mother relationship was negatively associated with the slope of the adolescent–father relationship; (e) gender presented an effect on the intercept and slope of depressive symptoms and on the adolescent–father relationship intercept, while age cohort showed an effect on the adolescent–mother relationship slope; and (f) errors of the adolescent–mother and adolescent–father relationships at Times 2 and 3 were positively linked with one another. Thus, better relationships between adolescents and their father and the mother at each time point were associated with lower levels of depressive symptoms at each time point, and decreases in the quality of the relationship with both the father and the mother were linked to the increase in depressive symptoms after the follow-up. Furthermore, a better relationship with the mother at each time point was associated with a lower rate of change in the relationship with the father, that is, with a lower decrease in the quality of the adolescent–father relationship. Finally, consistent with the first latent growth curve model, the effects of the adolescent–father relationship factors on depressive symptoms were more salient than the effects of the factors of the adolescent–mother relationship, as the standardized solutions showed.

Discussion

Regarding the first aim, a decrease in the perceived quality of adolescents' relationships with their father and mother were detected. Despite these changes during middle adolescence, it should be highlighted that the scores on the perceived quality of parent–adolescent relationships remained generally high among Spanish adolescents. These results are consistent with what Laursen and Collins (2009) indicated in their review of changes and continuity in parent–adolescent relationships. Furthermore, gender differences were detected in father–adolescent relationships, and a different pattern of change was detected in mother–adolescent relationships by age cohort. Boys reported better relationships with their father, and the change in relationships with the mother was greater among participants who were 12 years old at Time 1 than among 14-year-old

adolescents at that time point. The gender and age differences are consistent with the results of the HBSC study (Inchley & Currie, 2016), although that study followed a cross-sectional design. Our results also indicated an increase in depressive symptoms after the follow-up, in line with our hypothesis and with Costello et al.'s (2003) and Lewinsohn and Essau's (2002) conclusions. Gender differences were especially remarkable in both the mean scores and the pattern of change because girls presented more depressive symptoms than boys, and the increase in those symptoms was significant only among female adolescents. These gender differences provide some empirical support to data reviewed by Hilt and Nolen-Hoeksema (2008) and Strauman et al. (2011) and are consistent with what we expected.

With regard to the second aim of the study, our results indicated that adolescents with or without clinically significant depression experienced a decrease in the perceived quality of parental relationships, although adolescents with depressive symptoms over the cutoff reported worse relationships with both their mother and father. Furthermore, both perceived quality of the relationship with the father and mother presented a negative effect on depressive symptoms scores at every time point of the study. The gender effect on depressive symptoms was associated with a gender effect on the father–adolescent relationship such that the worse relationship between girls and their father partly explained the higher scores in depressive symptoms in each assessment time among girls; this finding confirms our expectations and aligns with research by Smojver-Ažić and Bezinović (2011) and Reeb and Conger (2009). A latent growth curve model integrating the change in study variables showed that the increase in depressive symptoms was associated with the decreases in both father–adolescent relationship and mother–adolescent relationship quality. These bidirectional associations are consistent with previous works, such as Boutelle et al. (2009) and Branje et al. (2010), and the associations between the rates of change are consistent with our hypothesis. Furthermore, a better relationship with the mother at the beginning of the study was associated with a lower decrease in the quality of the father–adolescent relationship. This result underlines the association between the quality of the relationships with both the father and the mother, and it suggests that a positive relationship with the mother could prevent the increase in difficulties with the father. Other important results that should be underlined are that the magnitude of the effect of the father–adolescent relationship at Time 1 on depressive symptoms after the follow-up is greater than the magnitude of the mother–

adolescent relationship at Time 1. Moreover, the magnitude of the association between the rate of change in the father–adolescent relationship and the rate of change in depressive symptoms is greater than the magnitude of the association with the change in the mother–adolescent relationship. Therefore, it seems that, although the relationships with both the mother and father presented significant effects and associations with depressive symptoms, the perceived quality of the relationship with the father showed a greater effect. This conclusion with Spanish adolescents is consistent with Videon (2005) and Sheeber et al. (2007), who noted the importance of the father–adolescent relationship and the mother–adolescent relationship in emotional well-being during adolescence.

To explain these associations, Sheeber et al. (2001) reviewed the mechanisms by which family relationships are important factors in depression during adolescence. In an integrative model, these authors suggested that there are four potential mechanisms of influence: stress versus support (adverse family environments characterized by the absence of supportive interactions and, conversely, by elevated troubled interactions), social interactions (because depressive behavior may have a functional role to provide desirable social consequences), cognitions (depressogenic cognitive distortions as well as failure to develop adequate problem-solving skills), or affect regulation (family interactional processes that develop impaired affect regulation strategies). Schwartz, Sheeber, Dudgeon, and Allen (2012) argued that parental behavior that reinforces depressive behavior, reciprocates aggression, and fails to positively reinforce positive behavior has been related to youth depression. In research analyzing videotaped problem-solving interactions, more adolescent depressive symptoms were found to be associated with more reported parental aggressive affect and less reported parental happy and neutral affect (Ehrmantrout, Allen, Leve, Davis, & Sheeber, 2011). To explain the association between adolescent depressive symptoms and troubled family relationships, a study about triadic interactions among the father, the mother, and the adolescent showed that triads with depressed adolescents displayed a wider and less predictable range of affect as well as less adaptive problem-solving interactions (Hollenstein, Allen, & Sheeber, 2016). Shortt et al. (2016) indicated that parents of adolescents with depressive disorder engaged in fewer supportive responses and more unsupportive responses than parents of nondepressed adolescents. Consequently, programs to prevent depressive symptoms in adolescence or to promote emotional well-being should include interventions focused on microsystem interactions from an interpersonal approach, targeting not only peer

relationships but also family relationships (Gladstone, Beardslee, & O'Connor, 2011; Restifo & Bögels, 2009). Specific interventions by gender should also be considered, since gender differences in family relationships (Horowitz & Garber, 2006) could confer differences in emotional development, especially regarding the relationship with the father. Moreover, although preventive programs could be especially necessary in adolescents with depressed parents (as reported in previous literature), adolescent mental health, from an ecological and a positive youth development perspective, may be strengthened through the promotion of better family relationships (Durlak et al., 2007; Weisz, Sandler, Durlak, & Anton, 2005), characterized by more parental support, increased ease of communication, more expressions of affection, and more received care and warmth. Better family relationships may help buffer adolescent's ability to manage stress and to healthily cope with developmental tasks in the social transition to adulthood (Rodrigo et al., 2004).

Some limitations should be discussed in our conclusions. No causal relationship can be established because no experimental design has been used. Moreover, these results cannot be generalized to a clinical sample because a nonclinical community sample was evaluated. A limitation that deserves special attention is the rate of attrition during the follow-up as well as the differences between the final sample and adolescents who did not participate in all waves. Adolescents who participated in all three assessments reported fewer depressive symptoms and better relationships with their fathers at baseline than adolescents who did not complete all assessments. An improvement on the present research may come from the use of recruitment methods that maximize the retention of participants at higher risk of dropout (Young, Powers, & Bell, 2006). Furthermore, the use of self-reported measures offered information only about the perception of the adolescents and does not represent an objective measure in a triadic interaction, such as the research by Hollenstein et al. (2016). The reported quality of parent-adolescent relationships could be considerably biased by depressive symptoms, in line with Millikan, Wamboldt, and Bihun (2002); therefore, a multimethod assessment is recommended. A more complete assessment of the perceptions of the quality of parent-adolescent relationship would also require the evaluation of parental perceptions of these relationships. Finally, a longer follow-up design is necessary to explore the changes in family relationships and emotional well-being during adolescents' transition to adulthood and to connect the results demonstrating the increase in depressive symptoms with those

found by Parra, Oliva, and Reina (2015) and Shearer et al. (2005), regarding changes in family relationships from early adolescence to emerging adulthood.

Despite these limitations, the present research makes some important contributions to the previous literature. We have provided evidence of the bidirectional associations between the decrease in perceived quality of parent–adolescent relationships and the increase in depressive symptoms after a 2-year follow-up among Spanish adolescents in a confirmatory model. This evidence supports the conclusions by Boutelle et al. (2009) and Branje et al. (2010) with adolescents from the United States and the Netherlands, respectively. This work also indicates the importance of gender differences because worse perceived father–adolescent relationships among girls was found to partly explain the higher presence of depressive symptoms in this subsample. Thus, this research has analyzed perceived parental relationship quality with a separate measure evaluating the relationships between adolescents and their mother and father. Importantly, this research has underlined that both these relationships were important to prospectively explain depressive symptoms, although the effect of the adolescent–father relationship was larger. However, a higher quality adolescent–mother relationship was related to a lower decrease in the perceived quality of the adolescent–father relationship.

Moreover, this measure of perceived parent–adolescent relationship quality showed good construct validity, integrating different aspects of family functioning already examined in previous literature, such as perceived support, ease of communication, expressions of affection, received care, and perceived warmth. Finally, we have provided empirical evidence of the relevant role of family relationships in a Mediterranean family model for adolescent psychological adjustment.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Spanish

Ministry of Education's University Lecturer Training Programme under Grant AP2009-4621, awarded to Diego Gomez-Baya.

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