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Depression and Anxiety Symptoms in Female Adolescents: Relations with Parental Psychopathology and Parenting Behavior

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Parental psychopathology and parenting behavior are known to be related to adolescents depression and anxiety, but unique roles of mothers and fathers are not clear. Our aim was to examine the relation of maternal and paternal psychopathology, emotional support, and respect for autonomy, and their interaction to depression and anxiety symptoms in adolescents. In total, 142 female adolescents participated, together with 138 mothers and 113 fathers. Data were analyzed using latent growth curve modeling. Paternal emotional support was negatively related to adolescent baseline level of depression and anxiety symptoms. Further, we found that there was a positive association between respect for autonomy and depression symptoms in adolescents for higher levels of paternal symptoms of psychological problems.

BACKGROUND

Depression and anxiety are among the most prevalent and most costly mental health problems. Early signs of depression and anxiety start to appear during childhood, and the development of these disorders rises dramatically during adolescence. For adolescents aged between 13 and 17, lifetime prevalence has been estimated at 12.6% for depression and 32.4% for anxiety disorders (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Suffering from a depression or anxiety disorder during adolescence can have serious consequences for the quality of life, because the disorders are related to poor psychological well-being, social impairment, poor academic functioning (Balazs et al., 2013; Fletcher, 2008; Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2003; Verboom, Sijtsema, Verhulst, Penninx, & Ormel, 2014), increased risk for substance abuse (McLeod, Horwood, & Fergusson, 2016; Merikangas, Dierker, & Szatmari, 1998), and both suicide attempts and completed suicide (Bolton et al., 2008; Glied & Pine, 2002). Furthermore, experiencing these disorders during adolescence is associated with recurrent depression and anxiety disorders later in life (Aalto-Setala, Marttunen, Tuulio-Henriksson, Poikolainen, & Lonnqvist, 2002; Copeland, Angold, Shanahan, & Costello, 2014; Pine, Cohen, Cohen, & Brook, 1999). Additionally, it is known that females have an elevated risk on developing depression and anxiety disorders and symptoms (Kessler et al., 2012). During adolescence, differences between male and female adolescents start to appear in prevalence; female adolescents show more depression and anxiety symptoms and have a higher vulnerability to develop depression and anxiety disorders (Chaplin, Gillham, & Seligman, 2009). Therefore, the focus of this study is on female adolescents.

It is well known that both depression and anxiety are familial disorders (Eley et al., 2015; Knappe, Beesdo-Baum, & Wittchen, 2010; Rice et al., 2017; Sander & McCarty, 2005). Parental psychopathology and negative parenting behavior are associated with adolescent depression and anxiety disorders and symptom severity (Garber, 2006; Schwartz et al., 2012). However, we do not yet know whether parental psychopathology and parenting behavior interact in their relation with the development of depressive and anxiety symptoms, and whether the relation of the

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interaction between parental psychopathology and parenting behavior to depression and anxiety symptoms in female adolescents is different for fathers and mothers. Because depressive and anxiety disorders have major individual consequences and are a societal burden, it is a priority to identify the developmental predictors of these disorders. For this reason, this study focused on the role of parenting behavior and parental psychopathology of mothers and fathers separately, and the relation of their interaction to the development of depressive and anxiety symptoms in adolescent females.

Parental psychopathology is a well-established predictor of development of depression and anxiety disorders in offspring (Connell & Goodman, 2002; Eley et al., 2015; England & Sim, 2009; Goodman & Tully, 2006; Goodman et al., 2011; Rice et al., 2017). Children of depressed parents are three times more likely to develop depression than children of parents without depression (Birmaher et al., 1996; Collishaw et al., 2016; Lieb, Isensee, Höfler, Pfister, & Wittchen, 2002), and children of parents with an anxiety disorder are even two to seven times more likely to develop an anxiety disorder themselves (Eley et al., 2015; Micco et al., 2009). The increased risk for depression and anxiety disorders in offspring can partly be explained by a high genetic predisposition (Boomsma, Van Beijsterveldt, & Hudziak, 2005; Middeldorp et al., 2005; Sullivan, Neale, & Kendler, 2000). In addition, environmental influences, such as the negative emotional climate that often pervades a child's home life when a parent has a depression or anxiety disorder (Goodman & Gotlib, 1999), and the gene–environment interaction contribute to depression and anxiety disorders in offspring (Rutter, 2002; Sullivan et al., 2000). Depressed parents often have negative cognitions, affect, and behaviors that compromise their ability to meet the child's social and emotional needs. This negatively affects children's development of social skills and cognitive styles through social learning and modeling (Schwartz et al., 2012). Together, these deficient social skills and negative cognitive styles place children at elevated risk for developing depression (Goodman & Gotlib, 1999). For anxiety, it is theorized that social learning mechanisms, such as acquiring parental attitudes, the imitation of parental actions, and parental modeling of anxious or avoidance behavior, mediate the influence of parental psychopathology on the development of anxiety in children (Beesdo, Knappe, & Pine, 2009).

Maternal and paternal psychopathology has been found to be independently related to depression and anxiety disorders during childhood (Kane & Garber, 2004). Some studies found that maternal depression was more strongly related to offspring internalizing problems than paternal depression (Brennan, Hammen, Katz, & Le Brocque, 2002; Connell & Goodman, 2002). Other studies reported a more pervasive impact of paternal psychopathology on levels of anxiety and depression symptoms in female adolescents (Bosco, Renk, Dinger, Epstein, & Phares, 2003). These inconsistencies might be explained by a different role of maternal and paternal psychopathology during the lifespan (Bögels & Phares, 2008; Connell & Goodman, 2002). Maternal psychopathology might be more influential during childhood, whereas paternal psychopathology might have a more detrimental impact on the development of depression and anxiety during adolescence (Connell & Goodman, 2002).

Besides parental psychopathology, negative parenting behavior has been associated with an increased risk for depression and anxiety disorders in offspring (Knappe, Lieb, et al., 2009; Needham, 2008). Traditionally, research has focused on two broad categories of parenting behavior, emotional support, and control. A lack of parental emotional support was found to be most strongly associated with offspring depression (McLeod, Weisz, & Wood, 2007). Parents who show low emotional support may increase children's negative perceptions about themselves and the world, which can lead to negative schemas that increase the vulnerability to depression symptoms (Boudreault-Bouchard et al., 2013; Hammen, 1992). High parental control was strongly associated with offspring anxiety disorders (McLeod, Wood, & Weisz, 2007). Parents who show a high level of control, also conceptualized as low respect for autonomy, may thwart opportunities for normative exploration of the environment and the development of self-efficacy. This, in turn, might increase their offspring's vulnerability for anxiety disorders (Boudreault-Bouchard et al., 2013; Rapee, 1997; Schleider, Vélez, Krause, & Gillham, 2014). In contrast, higher parental respect for autonomy is likely to increase children's confidence and can serve as a protective factor against the development of anxiety disorders (McLeod, Wood, & Weisz, 2007).

Research findings have not been clear about the unique roles of maternal and paternal parenting behavior in the development of adolescent depression and anxiety disorders. Concerning adolescent

depression, several studies found that a lack of maternal and paternal emotional support was equally important (Needham, 2008; Van Roekel, Engels, Verhagen, Goossens, & Scholte, 2011). Concerning anxiety disorders, low paternal respect for autonomy was found to have more impact on the development of anxiety disorders than low maternal respect for autonomy (Bögels & Perotti, 2011; Pereira, Barros, Mendonça, & Muris, 2014). It was also suggested that a lack of maternal and paternal respect for autonomy was more strongly related to offspring's anxiety disorders during childhood than during adolescence (Verhoeven, Bögels, & Van der Bruggen, 2012).

Studies on the interaction between parenting behavior and parental psychopathology for mothers and fathers separately have not resulted in consistent findings on their role in the development of depressive and anxiety symptoms in adolescents. The integrative model for the transmission of risk to children of depression mother by Goodman and Gotlib (1999) states that parenting is a mediating factor between parental psychopathology and depression and other disorders in adolescents. The more recent developmental model of transgenerational transmission of psychopathology by Hosman, Van Doesum, and Van Santvoort (2009) states that parenting competence plays a mediating role between parental psychopathology and child outcome, but can also have a moderating role. Earlier research showed that a combination of maternal depression and low maternal warmth, acceptance, and respect for autonomy was related to less resilience in children (Brennan, Le Brocque, & Hammen, 2003). In contrast, a combination of parental psychopathology and low emotional support or low respect for autonomy was found to account for the highest risk of anxiety in offspring (Knappe, Lieb, et al., 2009). Moreover, it has been found that whereas parental psychopathology is crucial for the onset of a disorder, an unfavorable family environment predicts higher persistence of the disorder (Knappe, Beesdo, et al., 2009). These studies presented important findings on the influence of maternal depression, parental psychopathology in general, and parenting behavior, and do not clearly state whether parenting plays a mediating or moderating role. In our study, we examined the moderation between parental psychopathology and parenting and studied the unique role of mothers and fathers and especially paternal psychopathology and parenting behavior.

The aim of the present study was to investigate whether maternal and paternal psychopathology and parenting behavior were related to the development of depression and anxiety symptoms in adolescent girls. We hypothesized that higher levels of parental psychopathology and low levels of parental emotional support and respect for autonomy would be related to higher baseline levels and an increase in offspring's depression and anxiety symptoms over time. In addition, we examined whether parental psychopathology and parenting behavior interacted with each other in affecting the development of depression and anxiety symptoms in female adolescents. More specifically, we expected that a combination of high parental psychopathology and low emotional support and low respect for autonomy would be related to a higher baseline level and an increase in depression and anxiety symptoms over time.

METHOD

Ethics

The medical ethics committee CMO Region Arnhem-Nijmegen, the Netherlands, approved the study (NL41344.091.12). The trial was registered in the Dutch Trial Register (NTR) as NTR3720. All participants provided written informed consent.

Procedure

The present study was part of an effectiveness trial on depression and anxiety prevention in adolescents with a high familial risk (Rasing, Creemers, Janssens, & Scholte, 2013; Rasing et al., 2018). In total, 862 female adolescents in first and second grades from five secondary schools participated in the screening with passive consent of their parents. They were screened on depression symptoms using the Children's Depression Inventory 2 (CDI 2) (Kovacs, 2012), on anxiety symptoms using the Spence Children's Anxiety Scale (SCAS) (Spence, 1998), on suicidal ideation using one item from the CDI 2, and on perceived parental symptoms of psychological problems using seven self-developed items.

After the screening, adolescents with elevated depression or anxiety symptoms who also had at least one parent with perceived psychopathology were contacted and together with their parents informed on the study. Adolescents and parents who decided to participate provided written and informed consent. Adolescents meeting our eligibility criteria, which included having elevated depression symptoms (CDI $2 \geq 15$) or elevated anxiety

symptoms (SCAS ≥ 39), having at least one parent with perceived parental symptoms of psychological problems, absence of prominent suicidal ideation, and having parental permission to participate, participated in an effectiveness trial for depression and anxiety prevention. For the effectiveness trial, the adolescents were randomly assigned to the intervention condition or control condition, stratified on school, grade, and educational level. Participants in the intervention condition attended six weekly meetings of a depression and anxiety prevention program and completed online questionnaires. Participants in the control condition only completed online questionnaires. Parents were informed about the study and invited to fill out four online questionnaires themselves. Of these 862 girls, 163 met the eligibility criteria of which three could not be reached, one received no parental permission, six already received care, and eleven declined participation. In total, 142 girls gave informed consent together with their parents.

Design

For this study, we used data of the effectiveness trial that was gathered at baseline (T0), postintervention at six weeks from baseline (T1), and follow-up at 6 months (T2) and at 12 months (T3). We applied latent growth curve modeling (LGCM) to estimate the individual development of depression and anxiety symptoms of the participants. We tested whether maternal psychopathology, maternal parenting behavior, and their interaction, paternal psychopathology, paternal parenting behavior, and their interaction were related to baseline level and change of depression or anxiety symptoms over time.

Participants

In total, 142 female adolescents with elevated levels of depression or anxiety symptoms participated in this study, together with both (77.5%), one (21.8%), or none (0.7%) of their parents. The adolescents, aged 11–14 years (M = 12.87, SD = .69), were in first or second grade of secondary school in various educational levels: vocational training (18.3%), vocational training—high school training (17.6%), high school training (15.5%), high school training—preuniversity training (30.3%), and preuniversity training (18.3%). Most of the adolescents were of Dutch nationality (97.2%), while the remaining adolescents (2.8%) were of different European and non-European origin.

Of the parents, 138 mothers participated (biological mothers, stepmothers, and foster mothers), aged between 28 and 56 (M = 43.89, SD = 4.41). Most of the mothers were of Dutch nationality (93.5%), while the other mothers (6.5%) were of different European or non-European origin. The 113 fathers who participated (biological fathers, stepfathers, and foster fathers) were aged between 37 and 61 (M = 47.10, SD = 4.58). Also, the majority of fathers were of Dutch nationality (92.0%), while the other fathers (8.0%) were of different European or non-European origin.

The retention rates were high with 137 (96.5%) adolescents completing the baseline assessment (T0), 131 (92.3%) completing the postintervention assessment (T1), 125 (88.0%) completing the 6-month follow-up assessment (T2), and 130 (91.5%) completing the 12-month follow-up assessment (T3). The retention rates for parents were also high with 133 (96.4%) mothers and 109 (96.5%) fathers completing baseline assessment (T0).

Measures

Adolescent depression symptoms. Depression symptoms were assessed using the Dutch version of the CDI 2 (Kovacs, 2012). This questionnaire consisted of 28 items, each consisting of 3 statements graded in the severity of 0 (absent), 1 (sometimes present), or 2 (always present). Sample statements include "Sometimes I feel sad," "Most of the times I feel sad," and "I always feel sad." The scores on all 28 items were added together to compute sum scores. Cronbach's alpha was 0.81 on T0, 0.89 at T1, 0.91 at T2, and 0.92 at T3.

Adolescent anxiety symptoms. Anxiety symptoms were assessed using the Dutch version of the SCAS (Spence, 1998). The questionnaire consisted of 44 items, rating the frequency of anxiety symptoms on a 4-point Likert scale ranging from never to always. Sample statements were "I worry about things" and "I am scared of the dark." Sum scores were computed by summing up all items, excluding the filler items (e.g., "I am popular amongst other kids my own age"). Cronbach's alpha was 0.82 at T0, 0.89 at T1, 0.89 at T2, and 0.90 at T3.

Adolescent perception of parental symptoms of psychological problems. Perceived parental symptoms of psychological problems were measured with a self-developed instrument with seven different statements about each parent (Rasing et al.,

2013). Sample statements were "My parent received treatment from a psychologist or psychiatrist" and "My parent had a depressed mood for more than 2 weeks." With at least one statement answered positively, we defined this as the presence of perceived parental symptoms of psychological problems. This instrument was used to select adolescents for the study, but was not included in further analyses.

Emotional support and respect for autonomy. Parental emotional support and respect for autonomy were assessed at baseline using subscales of the Dutch version of the Relational Support Inventory (RSI), "Warmth versus Hostility" and "Respect for autonomy versus setting limits," respectively (Scholte, Van Lieshout, & Van Aken, 2001). Each subscale consisted of six items rated on a 5-point scale ranging from "very untrue" to "very true." Both subscales were rated by the adolescents for each parent, resulting in measures of maternal emotional support, maternal respect for autonomy, paternal emotional support, and paternal respect for autonomy. Sample statements were "My mother or father supports me in what I am doing" and "My mother or father ridicules and humiliates me" for emotional support and "My mother or father lets me decide as often as possible" and "My mother or father sets strict rules, demands, and limits" for respect for autonomy. All items of the RSI Emotional support and respect for autonomy subscales can be found in Appendix. Mean scores were computed by averaging all items. Cronbach's alpha was 0.86 for maternal emotional support, 0.73 for maternal respect for autonomy, 0.87 for paternal emotional support, and 0.72 for paternal autonomy.

Parental symptoms of psychological problems. Maternal and paternal psychopathology was assessed at baseline using the Dutch version of the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983). The BSI is a short version of the Symptom Checklist-90 (SCL-90) (Derogatis, 1975) and consisted of 53 items rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). Sample statements were "Feeling no interest in things" and "Feeling tense or keyed up." Questionnaires were rated by each participating parent, resulting in maternal and paternal psychopathology. Mean scores were computed by averaging all items. Cronbach's alpha was 0.94 for maternal psychopathology and 0.93 for paternal psychopathology.

Statistical Analysis

We applied LGCM using Mplus (version 6.11) to examine individual development of depression and anxiety symptoms at baseline (i.e., the intercept) and the change in depression and anxiety symptoms over time (i.e., slope). Parameters in the models were estimated by applying the maximum likelihood estimator with robust standard errors (MLR). Robust maximum likelihood methods take violations of non-normality in dependent variables into account by adjusting standard errors and fit indices (Muthén & Muthén, 2010; Yuan & Bentler, 2000). Model fit was assessed by χ^2, CFI (preferably .95 or higher), RMSEA (preferably .05 or lower, and satisfactory between .05 and .08), and SRMR (preferably .08 or lower) (Hu & Bentler, 1998). To examine the development of depression and anxiety symptoms, we first tested growth models without predictors separately for depression and anxiety. The mean of the intercept in these models provides information about the average level of depression or anxiety symptoms at baseline, and the mean of the slope represents the average change in depression or anxiety symptoms across the four time-points. Condition (i.e., whether the adolescents participated in the intervention or control condition) was added to these models to account for nonindependence due to nesting within experimental condition. Second, we tested in separate models for depression and anxiety whether maternal psychopathology, maternal emotional support, maternal respect for autonomy, paternal psychopathology, paternal emotional support, and paternal respect for autonomy were related to baseline level and change of depression or anxiety symptoms over time. This was done by regressing the intercept (baseline level) and slope (change over time) of depression and anxiety symptoms on these parental variables. Again, condition was added to the models to account for nonindependence. Subsequently, we tested the relation of the interaction between parental symptoms of psychological problems and parental emotional support and the relation of the interaction between parental symptoms of psychological problems and parental respect for autonomy to the intercept and slope separately for mothers and fathers. To limit multicollinearity, all predictor variables were centered before computing the interaction terms. Models were tested for depression and anxiety symptoms separately. Again we added a condition to the models to account for nonindependence.

RESULTS

Descriptive Statistics

Means, standard deviations, and Pearson correlations of the model variables were calculated and are presented in Tables 1 and 2. Both depression and anxiety symptoms decreased significantly over time (Wilks' $\lambda = .91$, $F(3,119) = 3.99$, $p = .01$ and Wilks' $\lambda = .69$, $F(3,114) = 16.81$, $p < .001$, respectively). Depression and anxiety symptoms were highly correlated. Depression symptoms were negatively related to maternal and paternal emotional support, which means that depression symptoms tended to be lower at higher levels of emotional support. Anxiety at baseline was negatively related to paternal respect for autonomy, which means that anxiety symptoms tended to be lower at higher levels of respect for autonomy. Maternal emotional support and respect for autonomy were positively related to paternal emotional support and respect for autonomy. Paternal psychopathology was only related negatively to paternal emotional support.

Model Findings

The model for depression symptoms and the model for anxiety symptoms without predictors were tested first. The growth of depression symptoms was best fitted in a linear model (χ^2 [7, $N = 138$] = 7.14, CFI = 1.00, RMSEA = .01; 90% CI [.00, .11], and SRMR = .06). The intercept ($B = 13.68$, $p < .001$) and slope ($B = -.67$, $p = .04$) of depression symptoms were both significant, showing that participants on average scored 13.68

TABLE 1
Means and Standard Deviations of Model Variables

	Mean	SD
Depression symptoms T0	14.44	6.50
Depression symptoms T1	13.66	8.06
Depression symptoms T2	13.04	8.96
Depression symptoms T3	12.38	9.12
Anxiety symptoms T0	37.77	13.57
Anxiety symptoms T1	33.19	16.03
Anxiety symptoms T2	32.81	16.15
Anxiety symptoms T3	29.39	16.81
Maternal psychopathology	0.33	0.30
Maternal emotional support	4.18	0.80
Maternal respect for autonomy	3.74	0.73
Paternal psychopathology	0.25	0.25
Paternal emotional support	4.08	0.88
Paternal respect for autonomy	3.83	0.76

TABLE 2
Correlations between Model Variables

	1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*	*10.*	*11.*	*12.*	*13.*	*14.*
1. Depression symptoms T0	-	.69***	.60***	.61***	.61***	.47***	.40***	.42***	−.03	−.25**	−.15	.13	−.34***	−.14
2. Depression symptoms T1		-	.66***	.61***	.42***	.60***	.52***	.42***	−.05	−.16	−.09	.09	−.26**	−.11
3. Depression symptoms T2			-	.65***	.39***	.46***	.63***	.55***	.13	−.16	−.10	.21*	−.17	−.01
4. Depression symptoms T3				-	.33***	.38***	.41***	.69***	−.01	−.13	−.11	.15	−.18*	−.04
5. Anxiety symptoms T0					-	.72***	.59***	.49***	−.04	−.15	−.16	.04	−.26**	−.15
6. Anxiety symptoms T1						-	.73***	.65***	−.03	−.04	−.03	−.05	−.18	.03
7. Anxiety symptoms T2							-	.68***	−.01	−.08	−.03	.04	−.15	−.03
8. Anxiety symptoms T3								-	.01	−.03	.03	.13	−.13	.05
9. Maternal psychopathology									-	−.01	.01	.15	−.05	.10
10. Maternal emotional support										-	.68***	−.16	.74***	.55***
11. Maternal respect for autonomy											-	−.05	.60***	.64***
12. Paternal psychopathology												-	−.21*	−.04
13. Paternal emotional support													-	.71***
14. Paternal respect for autonomy														-

Note. *p < .05; **p < .01;***p < .001.

on depression symptoms with an expected linear decrease of 0.67 points per year. The growth of anxiety was best fitted in a nonlinear model in which the first two factor loading scores for the slope factor were set at 0 and 1, respectively, and the remaining factor scores were freely estimated (Bollen & Curran, 2006) (χ^2 [6, N = 138] = 6.28, CFI = 1.00, RMSEA = .02; 90% CI [.00, .11], and SRMR = .04). The intercept (B = 41.67, p < .001) and slope (B = −2.01, p = .003) were both significant, showing that participants scored an average of 41.67 on anxiety symptoms, which decreased over time.

Parental Symptoms of Psychological Problems, Parental Emotional Support, and Parental Respect for Autonomy

Subsequently, we tested the relation of maternal psychopathology, maternal emotional support, maternal respect for autonomy, paternal psychopathology, paternal emotional support, and paternal respect for autonomy in two separate models, one for depression symptoms (χ^2 [19, N = 103] = 29.70, CFI = .95, RMSEA = .07; 90% CI [.00, .12], and SRMR = .06) (Table 3) and one for anxiety symptoms (χ^2 [18, N = 103] = 24.00, CFI = .97, RMSEA = .06; 90% CI [.00, .11], and SRMR = .03) (Table 4). Paternal emotional support was related to the baseline level of depression symptoms (B = −3.62, p = .003), indicating that high levels of paternal emotional support were related to lower depression symptoms at baseline. No relationships were found with the rate of change in depression symptoms. Paternal emotional support was also found to be significantly related to baseline anxiety symptoms (B = −5.22, p = .02), indicating that higher levels of paternal emotional support were related to lower anxiety symptoms at baseline. Paternal respect for autonomy was found to be related to the rate of change in anxiety symptoms (B = .89, p = .05), indicating that higher paternal respect for autonomy was related to an increase in anxiety symptoms.

Interaction between Parental Symptoms of Psychological Problems and Parental Emotional Support and Respect for Autonomy

Additionally, we tested the relation of the interaction between maternal psychopathology and emotional support, maternal psychopathology and respect for autonomy, paternal psychopathology and emotional support, and paternal psychopathology and respect for autonomy to depression and anxiety symptoms, again in two separate models. In the model for depression symptoms (χ^2 [37, N = 103] = 48.49, CFI = .95, RMSEA = .06; 90% CI [.00, .09], and SRMR = .04) (Table 3), none of the interactions between parental symptoms of psychological problems and parenting behavior were significant predictors of the slope (i.e., there were no three-way interactions with time). Given that the interactions as predictors of slope worsened the model fit considerably and none approached significance, they were dropped from the final model. In the model for depression symptoms, we controlled for condition. Condition showed a significant association with the intercept of depression symptoms, which means condition explains a small part of the variance of the intercept.

The interaction between paternal psychopathology and paternal respect for autonomy was related to depression symptoms at baseline (B = 11.95, p = .03), indicating that for low levels of paternal symptoms of psychological problems, the association between paternal respect for autonomy and adolescent baseline depressive symptoms was not significant, and that at higher levels of parental symptoms of psychological problems, paternal respect for autonomy was positively related to depression symptoms. This interaction is also presented in Figure 1, where a Johnson–Neyman plot shows the interaction between paternal respect for autonomy and paternal symptoms of psychological problems in predicting baseline adolescent depressive symptoms (Miller, Stromeyer, & Schwieterman, 2013). The estimated effect of paternal respect for autonomy on adolescent baseline depressive symptoms (y-axis) is plotted against all observed levels of paternal psychopathology (x-axis). The curved red lines represent 95% confidence bands. At levels of paternal psychopathology ≥ 1.4 SDs above the sample mean (indicated by the vertical gray line), the effect of paternal respect for autonomy on adolescent baseline depressive symptoms was positive and significant (i.e., the 95% confidence bands did not contain 0). At low levels, the effect of paternal respect for autonomy on adolescent depressive symptoms was not significant (i.e., the 95% confidence bands did contain 0).

In the model for anxiety symptoms (χ^2 [26, N = 103] = 33.31, CFI = .97, RMSEA = .05; 90% CI [.00, .10], and SRMR = .03) (Table 4), the intercept and slope were regressed on main and interaction effects. The interaction between paternal psychopathology and paternal respect for autonomy on anxiety symptoms at baseline (B = 19.77, p = .052) was not significant. However, it showed a

TABLE 3
Regression Estimates for Initial Level (Intercept) and Rate of Change (Slope) in Adolescents' Depression Symptoms on Main Effects of and Interactions between Parental Psychopathology, Parental Emotional Support, and Parental Respect for Autonomy

	Intercept		*Slope*	
Predictor	*Estimate*	SE	*Estimate*	SE
Model with main effects				
Condition	2.12	1.38	.02	.23
Maternal psychopathology	0.37	1.99	−.02	.52
Maternal emotional support	0.48	1.29	−.07	.29
Maternal respect for autonomy	0.05	1.14	−.08	.23
Paternal psychopathology	2.56	2.90	.42	.39
Paternal emotional support	−3.62**	1.24	.22	.31
Paternal respect for autonomy	1.22	1.25	−.01	.27
Model with main and interaction effects				
Condition	2.66*	1.27	-	-
Maternal psychopathology	−7.34	10.25	-	-
Maternal emotional support	0.31	1.53	-	-
Maternal respect for autonomy	−1.10	1.90	-	-
Paternal psychopathology	−36.80	20.78	-	-
Paternal emotional support	−3.52	1.86	-	-
Paternal respect for autonomy	−0.94	1.46	-	-
Maternal psychopathology × maternal emotional support	−0.08	2.79	-	-
Maternal psychopathology × maternal respect for autonomy	2.31	3.71	-	-
Paternal psychopathology × paternal emotional support	−1.64	4.14	-	-
Paternal psychopathology × paternal respect for autonomy	11.95*	5.38	-	-

Note. *$p < .05$; **$p < .01$.

TABLE 4
Regression Estimates for Initial Level (Intercept) and Rate of Change (Slope) in Adolescents' Anxiety Symptoms on Main Effects of and Interactions between Parental Psychopathology, Parental Emotional Support, and Parental Respect for Autonomy

	Intercept		*Slope*	
Predictor	*Estimate*	SE	*Estimate*	SE
Model with main effects				
Condition	−1.89	2.71	0.46	0.54
Maternal psychopathology	−1.79	4.22	−0.81	0.91
Maternal emotional support	5.02	2.68	−0.12	0.55
Maternal respect for autonomy	−4.24	2.63	0.78	0.47
Paternal psychopathology	3.93	4.92	−0.54	0.89
Paternal emotional support	−5.22*	2.20	−0.77	0.52
Paternal respect for autonomy	0.70	2.37	0.89*	0.45
Model with main and interaction effects				
Condition	−1.16	2.68	0.39	0.53
Maternal psychopathology	−16.25	16.67	−2.30	2.90
Maternal emotional support	3.48	3.92	0.40	0.83
Maternal respect for autonomy	−4.95	4.21	0.27	0.70
Paternal psychopathology	−42.51	30.96	6.65	3.80
Paternal emotional support	−3.50	3.74	−1.09	0.81
Paternal respect for autonomy	−3.22	3.12	1.50*	0.63
Maternal psychopathology × maternal emotional support	3.64	7.09	−1.34	1.57
Maternal psychopathology × maternal respect for autonomy	0.41	8.09	1.80	1.74
Paternal psychopathology × paternal emotional support	−7.54	8.07	1.01	1.60
Paternal psychopathology × paternal respect for autonomy	19.77	10.19	−2.91	1.75

Note. *$p < .05$.

trend toward a similar pattern as in depression symptoms. The results indicated that in lower levels of paternal psychopathology, paternal respect for autonomy is slightly more negatively related to anxiety symptoms, and in higher levels of paternal psychopathology, parental respect for autonomy is slightly positive associated with anxiety symptoms. Nonetheless, this interaction was not significantly related to anxiety symptoms. Further, no interactions between parental symptoms of psychological problems and parental emotional support were significantly related to depression or anxiety symptoms.

DISCUSSION

The aim of the present study was to investigate whether paternal and maternal psychopathology and parenting behavior were related to the levels and development of depression and anxiety symptoms in female adolescents. In addition, we examined whether parental symptoms of psychological problems and parenting behavior interacted with each other in affecting the development of depression and anxiety symptoms.

The findings of our study showed that adolescents who experienced lower paternal emotional support had higher levels of both depression and anxiety symptoms at baseline than adolescents who experienced higher paternal emotional support. Further, our findings showed that higher paternal respect for autonomy was related to an increase in anxiety symptoms over time. In addition, we found a significant relation of the interaction between paternal psychopathology and paternal respect for autonomy to depression symptoms in adolescents. No relations were found between depression and anxiety symptoms and maternal psychopathology and parenting behavior.

Parental Symptoms of Psychological Problems, Parental Emotional Support, and Parental Respect for Autonomy

In the present study, no direct relationships were found between maternal and paternal psychopathology and the baseline level and development of depression and anxiety symptoms of the adolescent girls. This ran counter to our expectations and previous research on the impact of

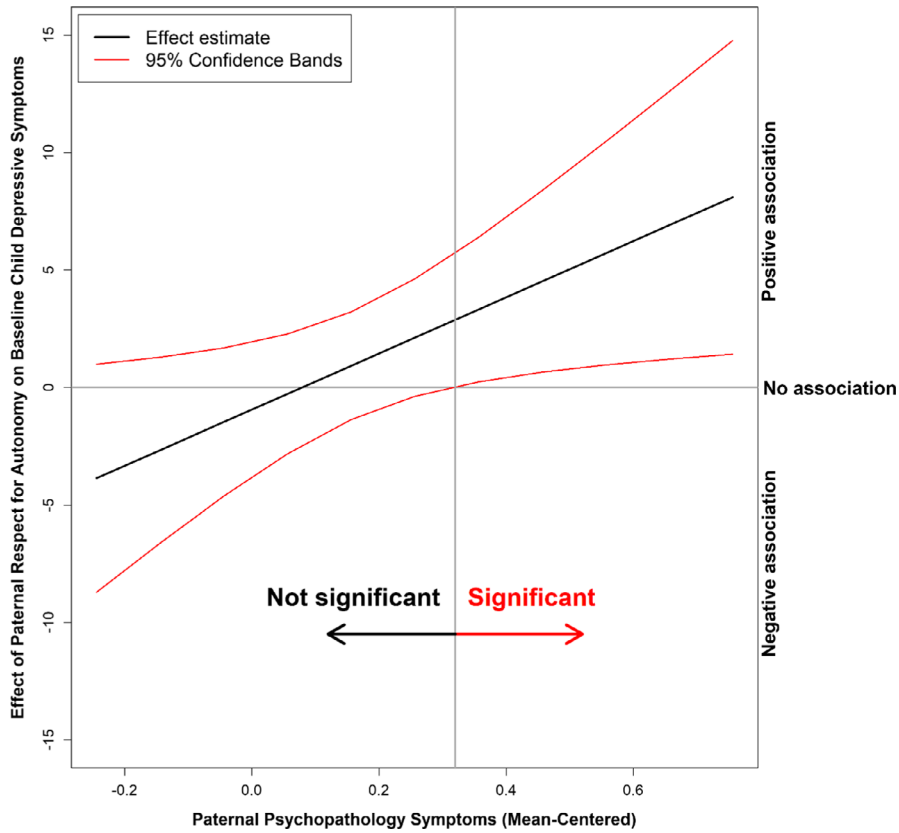

FIGURE 1 Johnson–Neyman plot showing the interaction between paternal respect for autonomy and paternal symptoms of psychological problems in predicting baseline adolescent depressive symptoms. [Color figure can be viewed at wileyonlinelibrary.com]

parental symptoms of psychological problems, suggesting that parental disorders were found to be related to child depression and anxiety symptoms (Eley et al., 2015; Lieb et al., 2002; Micco et al., 2009). A possible explanation for not finding the expected relationships might be that the average level of parental symptoms of psychological problems in our study was very low. Therefore, the stressor of parental symptoms of psychological problems may have been too mild compared to other studies that examined the relationships between parental clinical depression or anxiety disorders and depression and anxiety symptoms in adolescents (Lieb et al., 2002). In addition, earlier studies found that children's perceptions of the family environment are adequate and that children are influenced by their perceptions about parental attitudes and behavior, rather than by the actual parental behaviors or the behavior reported by parents (Demo, Small, & Savin-Williams, 1987; Human, Dirks, DeLongis, & Chen, 2016; Tein, Roosa, & Michaels, 1994). In this study, parents reported about their own psychopathology, and that might have contributed to not finding a relationship, especially because levels of parental psychopathology were low.

The literature on intergenerational transmission of psychopathology describes the transmission in two ways, namely disorder-specific transmission (e.g., from parental depression to depression in offspring) and general transmission (from disorders in parents to psychopathology in offspring). Studies on disorder-specific transmission are able to focus on the similarities in specific characteristics of the disorders for the parents and child, for example, the presence and development of negative cognitions in a sample with depressed mothers and their children (Garber & Cole, 2010). In our study, our main interest was the development of depression and anxiety in adolescents. These are among the most prevalent mental disorders in adolescents and are often the first expression of mental health problems leading to other disorders (Clayborne, Varin, & Colman, 2019; Last, Hansen, & Franco, 1997; Rao et al., 1995; Woodward & Fergusson, 2001). Therefore, we decided to capture parental symptoms of psychological problems in a general parental psychopathology variable to prevent us from measuring a very strict range of symptoms of, for example, only depression or anxiety, and as a consequence neglect symptoms. Measuring general psychopathology in parents in a more general way gave the opportunity to take a broader range of symptoms into account.

Concerning parenting behavior, we found negative relations between paternal emotional support and depression and anxiety symptoms. This is partly in line with our expectations, namely that adolescents of mothers and fathers who provide low levels of support had the highest levels of depression and anxiety symptoms at baseline. Adolescents may develop negative schemas about themselves and the world when parents fail to provide adequate emotional support, which may in turn lead to an increased vulnerability for depression symptoms. Contrary to our expectations, none of the maternal parenting behavior aspects were related to depression and anxiety symptoms in high-risk female adolescents. Previous research has been inconsistent about the different impact of maternal and paternal influences on the development of depression and anxiety symptoms. Recent research suggested that paternal influences might be more important during adolescence, whereas maternal influences have the most important impact on younger children (Bögels & Phares, 2008; Verhoeven et al., 2012). This might explain why we found no relations between maternal psychopathology or maternal parenting behavior and depression and anxiety symptoms in adolescents.

Findings also showed a positive relationship between paternal respect for autonomy and the development of anxiety symptoms over time and this relationship remained significant after incorporating the interactions into the model. Earlier studies showed negative relations between parental respect for autonomy and anxiety in children and adolescents (McLeod, Wood, & Weisz, 2007) and this is in contrast to our findings. A possible explanation might be that we measure these parenting behaviors and symptoms in a specific and small period of time (i.e., early adolescence) and it might be that these female adolescents need more guidance in this stage of their lives. They specifically experience stress from changing from primary to secondary school, and they might need more guidance than usual. Another explanation is that we selected female adolescents with an elevated level of anxiety, and it might be that these girls need more strict parenting behavior from their father then girls with lower levels of anxiety.

Interaction between Parental Symptoms of Psychological Problems and Parental Emotional Support and Respect for Autonomy

We found a relation of the interaction between paternal symptoms of psychological problems and

paternal respect for autonomy to depression symptoms in adolescents. The relation indicated that at lower levels of paternal psychopathology symptoms, the association between paternal respect for autonomy and adolescent depressive symptoms at baseline was not significant, and when fathers showed higher levels of psychopathology symptoms, respect for autonomy was positively related to depression symptoms. This means that when fathers had average to lower levels of psychopathology symptoms, adolescent baseline symptom levels remained the same with increasing levels of paternal respect for autonomy. In other words, a combination of low parental symptoms of psychological problems and lower negative parenting was not related to depressive symptoms. This part is not in line with our expectations that a combination of lower parental symptoms of psychological problems and lower negative parenting behavior would be related to lower depression symptoms in children (Knappe, Lieb, et al., 2009).

In addition, we found that when fathers had very high levels of psychopathology, adolescent depressive symptoms *increased* with increasing levels of paternal respect for autonomy. This is also not in line with our expectations. A possible explanation for this might be that adolescents interpret behaviors that are typically indicative of adaptive parenting behavior (respect for autonomy) as being maladaptive (i.e., signs of disinterest or low involvement) in the context of paternal psychopathology. Conversely, adolescents might interpret low respect for autonomy or high levels of paternal control as interest in the adolescent's behavior and establishing rules and consequences when paternal psychopathology is present. In literature, the distinction between autonomy granting, that is, parental encouragement of developing independence, and parental overcontrol, that is, parental overcontrol that encourages emotional dependence, is made (Pinquart, 2017; Silk, Morris, Kanaya, & Steinberg, 2003). The subscale respect for autonomy of the relational support inventory that was used in this study contains items of both autonomy granting and parental overcontrol. This might explain the ambiguous interpretation of the concept of respect for autonomy. When paternal symptoms of psychological problems were added to the relation between paternal respect for autonomy and adolescent depressive symptoms, the interpretation of autonomy grating and paternal overcontrol might have shifted more toward overcontrol, explaining the positive association with depressive symptoms. Parental overcontrol is, in contrast to autonomy granting, known to increase the risk on depression and anxiety symptoms in adolescents (Yap, Pilkington, Ryan, Kelly, & Jorm, 2014). We also found an indication that the same relationships hold for anxiety symptoms, that is, that parenting behavior was not related to anxiety symptoms when fathers showed lower parental symptoms of psychological problems, and that when parental symptoms of psychological problems were higher, higher respect for autonomy was related to more anxiety symptoms. However, results only showed a trend for these relationships and we have to be careful drawing conclusions.

This study had important limitations that need to be taken into account when interpreting the results. First, the average decrease in depression and anxiety symptoms was low. Therefore, it was hard to predict a decrease or increase in depression or anxiety symptoms by using parental symptoms of psychological problems and parenting behavior as predictors. Moreover, we measured the development of depression and anxiety symptoms for a period slightly over a year and in the context of a prevention study. Future studies should consider examining the development of these symptoms during a longer period of time and predicting relations over time, so that directions the association can be assumed. Also, future studies should examine these relations in other samples, that is, without an intervention. Although the intervention explained only a small part of the variance, we suggest to test this relation in a sample receiving no intervention. In addition, average levels of depression and anxiety symptoms in adolescents were mild to moderate relative to the norming sample in the Netherlands, and the level of parental symptoms of psychological problems was very low (i.e., only about 35% of the mothers and 25% of the fathers had higher symptoms of psychological problems compared with the population mean). This means that the level of symptoms may be too mild to detect an influence on child symptom development. Sharpening the inclusion criteria concerning parental psychopathology might improve results in the future. We suggest to screen parents on their symptoms and not ask adolescents about their parents' symptoms. Research indicated that depressed mothers tend to over-report symptoms in their children (Gartstein, Bridgett, Dishion, & Kaufman, 2009). This might also be the case for adolescent with elevated depression or anxiety symptoms reporting on their parents. Finally, adolescents might be exposed to other stressors that are related to depression and anxiety symptoms,

such as child abuse (Brown, Cohen, Johnson, & Smailes, 1999; Lindert et al., 2014), marital distress (Ramchandani et al., 2011), marital divorce (Oldehinkel, Ormel, Veenstra, De Winter, & Verhulst, 2008), or other life events that we did not take into account in this study, but could have influenced the results. Future studies may consider taking these stressors into account.

CONCLUSION

Our results suggest paternal emotional support was negatively related to baseline level of depression and anxiety symptoms in female adolescents. In addition, we found a relation of the interaction effect between paternal respect for autonomy and paternal psychopathology to depression symptoms in adolescents. It indicated that when fathers had average to low levels of psychopathology, paternal respect for autonomy was not related to depression symptoms; and when fathers showed high levels of psychopathology, respect for autonomy was positively related to depression symptoms. Our results did not show the impact of maternal psychopathology and parenting behavior on depression or anxiety symptoms in adolescents. Findings of this study might provide additional directions for the prevention of depression and anxiety in adolescent females. In particular, parenting characteristics (respect for autonomy) of father and paternal symptoms of psychological problems have shown to be related to depression symptoms and prevention programs might, therefore, have attention for the adolescents' relation and communication to parents and not only focus on their own negative thoughts and behavior. Since this study was one of the first studies to examine the influence of the interactions between parental symptoms of psychological problems and parenting behavior on the development of depression and anxiety symptoms, replication of these findings is needed.

CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

APPENDIX
ITEMS OF RSI SUBSCALES

Emotional support: warmth versus hostility

- This person shows that he/she admires me
- This person shows me that he/she loves me
- This person supports me in what I do
- In the eyes of father, I cannot do anything right
- This person ridicules and humiliates me
- This person treats me roughly and aggressively, gives me a lot of punishment

Respect for autonomy: respect for autonomy versus setting limits

- This person lets me decide as often as possible
- This person lets me try things myself as often as possible
- This person lets me solve my problem and helps if I want to
- This person makes decisions that I would like to make myself
- This person sets strict rules, requirements, and limits
- I have to do exactly what this person wants; gives orders

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