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Laura M. Padilla-Walker
Brigham Young University, laura_walker@byu.edu

Hannah B. Apsley

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BRIEF REPORT

Longitudinal Links Between Parents' Mental Health, Parenting, and Adolescents' Mental Health: Moderation by Adolescent Sex

Hannah B. Apsley
Pennsylvania State University

Laura M. Padilla-Walker
Brigham Young University

This study explored mothering and fathering as possible mediators of the relationship between parent and adolescent mental health concerns and considered the adolescents' biological sex as a potential moderator. Using structural equation modeling, the longitudinal links between parents' mental health, parental psychological control, parent-adolescent connectedness, and adolescent mental health in 500 families—including 338 fathers and 500 mothers—were explored over the course of 5 years. The mean age of the adolescents (51.8% female, 69.6% European American) at Time 1 was 13.3 years. Mothers' symptoms of anxiety directly predicted girls' depression 5 years later. This relation was not mediated by parenting behaviors. Fathers' symptoms did not directly or indirectly predict adolescent symptoms. Additionally, the relations of maternal parenting with adolescent mental health symptoms 4 years later were moderated by adolescent sex. Specifically, maternal connection was associated with decreased anxiety and depression for boys alone, whereas maternal psychological control was associated with increased anxiety and depression for girls. The father model was generally not moderated by adolescent sex. Limitations of this study include the discrepancy in the sample size of mothers and fathers; more significant findings may have emerged with a larger sample size of fathers. This study highlights the important role that adolescent sex plays in relationships surrounding parenting and mental health in the family system.

Keywords: mental health, parenting, adolescence, biological sex, longitudinal design

Supplemental materials: http://dx.doi.org/10.1037/fam0000788.supp

It has been estimated that nearly a third of modern American adolescents suffer from an anxiety disorder, whereas greater than 10% suffer from major depressive disorder (Merikangas et al., 2010), and since the early 2000s the prevalence of adolescents' emotional disorders has been steadily increasing (Mojtabai, Olfson, & Han, 2016). The frequency of these disorders is not restricted to adolescents alone; in 2016 it was estimated that 6.7% of American adults had experienced a major depressive episode in the last year (Center for Behavioral Health Statistics and Quality, 2017), and parents' mental health disorders are predictive of adolescents' development of these disorders (Johnson, Lawrence, Perales, Baxter, & Zubrick, 2018). As has been posited by the Family Stress Model of Economic Hardship (Conger et al., 2002), the co-occurrence of parents' and adolescents' mental health concerns may in part be due to disrupted parent-adolescent relationships. In the current study, we explored how disrupted parent-adolescent relationships may mediate the relations between parents' and adolescents' anxious and depressive symptoms. We also explored how these patterns of relations may differ as a function of adolescents' biological sex.

Parents' Mental Health and the Parent-Adolescent Relationship

The Family Stress Model proposes that distressed parents experience increased trait aggression and conflict, which may spill over into interparental conflict as well as hostile and negative parenting practices for both parents (Conger et al., 2002). This tenet is applicable to parental mental health concerns because parents' depression is longitudinally associated with less parental warmth and greater parental hostility (Forehand et al., 2012), and mothers' anxiety is cross-sectionally associated with less parental displays of connection (e.g., cohesion; Drake & Ginsburg, 2011) and support (Root, Hastings, & Rubin, 2016). We propose that the relationship between parents' mental health and their parenting is especially salient for adolescent mental health because parenting may promote or protect against adolescent mental health concerns.

Hannah B. Apsley, Human Development and Family Studies, Pennsylvania State University; Laura M. Padilla-Walker, School of Family Life, Brigham Young University.

Correspondence concerning this article should be addressed to Hannah B. Apsley, Human Development and Family Studies, Pennsylvania State University, 016 Health and Human Development Building, University Park, PA 16802. E-mail: hvb5247@psu.edu

Parenting and Adolescents' Mental Health

Another main tenet of the Family Stress Model is that disrupted family processes, such as negative parenting, may negatively influence adolescent outcomes. One of the parenting behaviors that falls under this umbrella of negative parenting is psychological control, which has been longitudinally associated with adolescent depression (Bleys, Soenens, Claes, Vliegen, & Luyten, 2018) and cross-sectionally associated with adolescent anxiety (Luebbe, Tu, & Fredrick, 2018).

On the other hand, one of the many facets of an adolescent's life that may longitudinally protect him/her against anxious and depressive symptoms is a feeling of social connectedness (Cruwys et al., 2013) or an "internal sense of belonging . . . [and] subjective awareness of being in close relationship with the social world" (Lee & Robbins, 1998, p. 338). Because feeling a sense of connectedness with parents is negatively associated with feelings of loneliness (Ang, 2016), adolescents' social connectedness with their parents may protect against mental health concerns.

Moderation by Adolescent Sex

During adolescence, boys and girls experience different general propensities toward internalizing symptoms (Ohannessian, Cavanaugh, & Cheeseman, 2017) as well as different trajectories of these symptoms across time (Kwong et al., 2019). Additionally, throughout adolescence, patterns of maternal and paternal relationship quality tend to be different for boys and girls (Ebbert, Infurna, & Luthar, 2019). Whereas these mean sex differences are well established, very few studies on longitudinal mental health in the family explore a moderation of these relations as a function of adolescent sex. This study aims to address these concerns.

Social learning theory suggests that adolescents are more likely to model the behavior of their parent of the same sex than their opposite-sex parent (Bussey & Bandura, 1984). Adolescents may model parents' internalizing symptoms as well as their parenting, and both may be related to adolescent internalizing symptoms. For example, in displaying symptoms of anxiety and depression, parents may inadvertently model responses to stress for their adolescents. In being psychologically controlling, parents exhibit criticism of the adolescent (Barber, 1996), thereby encouraging adolescents to model this behavior and become more critical of themselves, which is a risk for adolescent depression (Bleys et al., 2018). To address these tenets, variables regarding parents' mental health are included in the models separately but simultaneously for mothers and fathers, rather than conflating the two.

Current Study

The purpose of this paper was to identify variables in the family system—such as mothers' and fathers' anxiety and depression, psychological control, and parental connectedness—that uniquely predicted adolescents' anxious and depressive symptoms. Adolescent age, family income, family structure, and ethnicity were controlled for. Adolescent sex was explored as a moderator of these relations.

Our hypotheses were 3-fold: First, we hypothesized that mothers' and fathers' symptoms of anxiety and depression at baseline would positively predict adolescents' symptoms of anxiety and depression 5 years later when the participants had reached late adolescence. Second, we hypothesized that this positive relationship would be mediated by the parent-adolescent relationship. More specifically, parents' symptoms of anxiety and depression at baseline would be negatively associated with parent-adolescent connectedness and positively associated with parental psychological control a year later. Parental connectedness would, in turn, be negatively associated with adolescent anxious and depressive symptoms 4 years later, whereas psychological control would be positively associated with these symptoms. Third, we explored a moderation of these relations by adolescent sex. We specifically anticipate that boys will be more reactive to fathers' symptoms and parenting, whereas girls will be more reactive to mothers'.

Method

Participants and Procedures

The participants for this study were taken from waves 3, 4, and 8 of the Flourishing Families Project, a longitudinal study involving families with an adolescent between the ages of 11 and 14 years at Wave 1. Wave 3 was chosen as baseline for the current study because it was the first wave that data were collected on the adolescents' anxiety and depression. Wave 8 was chosen to measure anxiety and depressive outcomes in the adolescents because participants were in late adolescence, which is when these symptoms often peak (Kwong et al., 2019). The first wave of data was collected in 2007, with the following waves being collected each subsequent year. (For ease in the current study, we will refer to Waves 3, 4, and 8 as Times 1, 2, and 3). Ninety-seven percent of the families that participated at Time 1 also participated at Time 3.

The sample consisted of 500 families from a city in the Pacific Northwest with an adolescent within the target range (52% female; 33% single parent families). Adolescents reported on both their mother and father if both were involved in the adolescent's life, and 338 fathers and 500 mothers participated. At Time 1, participant adolescents averaged 13.3 years of age (SD = 1.0), whereas mothers averaged 45.2 years (SD = 6.77) and fathers averaged 47.3 years (SD = 6.17) of age. In regard to ethnicity, 60% of the families were European American, 11% were African American, 18% had a combination of two or more ethnicities among family members, and Hispanic and Asian-Americans families both totaled less than 1% of the sample, respectively. In terms of parental education, 61% of mothers and approximately 70% of fathers had a bachelor's degree or higher. Related to yearly family income, 23% of families reported making less than $59,000; 33% reported income in the $60,000–99,000 range; and 45% reported income above $100,000. This project was approved by the local institutional review board.

Measures

Demographic variables. Adolescent age, family income, family structure (*single* = 1, *two parent* = 0), and ethnicity (*European American* = 1, *all other* = 0) at the initial time point were used as controls. Adolescents reported on their biological sex (*male* = 0, *female* = 1) at Wave 2 of data collection.

Parental depression and anxiety. Parental depressive symptoms were assessed at Time 1 using 11 items from the Center for

Epidemiologic Studies–Depression Scale (Radloff, 1977). This measure was reduced because of survey length, and factor analyses confirmed reliability (factor loadings $> .50$, $\alpha = .80$ mothers, .78 fathers). Parents responded to how often statements such as "I felt depressed" were true of the last week using a 3-point Likert scale ranging from 1 (*never*) to 3 (*most of the time*).

Parental anxiety was assessed at Time 1 using an eight-item self-report measure, based on the Burns Anxiety Inventory (Burns, 1989). Participants responded to how often they experienced specific thoughts or feelings such as "sudden unexpected panic spells" in the last week using a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*a lot*). Cronbach's alpha reliability coefficients for the current sample were .78 (mothers) and .76 (fathers).

Parent-adolescent connectedness. Parent-adolescent connectedness was assessed at Times 1 and 2 using an adapted version of a general social connectedness measure by Lee, Draper, and Lee (2001). Adolescents evaluated first mothers, then fathers, using six items each. Adolescents reported their agreement with statements such as "I feel so comfortable with my parent that I can tell him/her anything," using a Likert scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alphas ranged from .78 to .80.

Parental psychological control. Parental psychological control was assessed at Times 1 and 2 using eight items, including "My parent will avoid looking at me when I have disappointed her/him" from the Psychological Control Scale-Youth Self Report (Barber, 1996). Adolescents evaluated first mothers, then fathers, using a scale ranging from 1 (*never*) to 5 (*very often*). Cronbach's alphas ranged from .86 to .87.

Adolescents' depression and anxiety. Adolescents reported their depression at Times 2 and 3 using the 20-item self-report Center for Epidemiological Studies Depression Scale for Children (Weissman, Orvaschel, & Padian, 1980; α Time 1 = .92, α Time 3 = .92). Participants responded by rating the amount that they had experienced things in the past week such as "I felt lonely, like I didn't have any friends", with a Likert-type response scale ranging from 1 (*not at all*) to 4 (*a lot*).

Adolescents reported their anxiety at Time 2 and Time 3 using the six-item generalized anxiety disorder subscale from the Spence Child Anxiety Inventory (Spence, 1998; α Time 2 = .83, α Time 3 = .88). Participants responded to items such as "I worry a lot about things" using a 4-point Likert scale ranging from 0 (*never*) to 3 (*always*); higher scores reflected greater levels of anxiety.

Analysis Plan

Path models were conducted using structural equation modeling, with separate models for mothers' and fathers' parenting because of collinearity in adolescent reports of parenting, evidenced by high correlations (r ranged from .41 to .74) and suppressor effects when mother and father parenting variables were put into the same model (e.g., for girls maternal connection was related to more anxiety; and for boys paternal psychological control was associated with less depression). Missing data were minimal (<5% on any given variable) and were handled using Full Information Maximum Likelihood in MPLUS. Each model considered both mothers' and fathers' depression and anxiety at Time 1 as predictors of adolescents' depression and anxiety at Time 3 (controlling for levels at Time 2) and parental connection and psychological control at Time 2 (controlling for initial levels at Time 1). We also

Table 1
Correlations Between Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Adolescent age	1.00																	
2. Family income	−.02	1.00																
3. M, Depress, T1	.06	−.24***	1.00															
4. F, Depress, T1	.05	−.08	.20***	1.00														
5. M, Anx, T1	.04	−.13*	.65***	.20***	1.00													
6. F, Anx, T1	.12*	−.08	.15**	.67***	.19***	1.00												
7. M, PC, T1	.12*	−.05	.14**	.10	.09	.10	1.00											
8. M, PC, T2	.10*	−.04	.14**	.10	.07	.08	.62***	1.00										
9. F, PC, T1	.05	−.06	.13*	.11	.10*	.11	.65***	.48***	1.00									
10. F, PC, T2	.03	−.10	.13**	.12*	.14**	.13*	.52***	.75***	.63***	1.00								
11. M, Connect, T1	−.05	.05	−.19***	−.03	−.14**	−.01	−.41***	−.23***	−.27***	−.19***	1.00							
12. M, Connect, T2	−.01	−.02	−.17***	−.09	−.18***	−.03	−.35***	−.34***	−.17***	−.25***	.59***	1.00						
13. F, Connect, T1	−.10	.08	−.29***	−.01	−.26***	−.03	−.27***	−.25***	−.34***	−.30***	.74***	.46***	1.00					
14. F, Connect, T2	−.07	.06	−.25***	−.11	−.29***	−.07	−.30***	−.30***	−.19***	−.31***	.41***	.74***	.58***	1.00				
15. A, Anx, T2	.05	.02	.01	.11	.04	.14*	.18***	.21***	.10	.17***	.00	−.11*	−.10	−.15**	1.00			
16. A, Anx, T3	−.04	.01	.02	.06	.05	.01	.13**	.17***	.00	.09	−.01	−.09	.02	−.07	.47***	1.00		
17. A, Depress, T2	.09	−.01	.16***	.15*	.16***	.12*	.27***	.41***	.23***	.34***	−.13**	−.29***	−.25***	−.35***	.52***	.36***	1.00	
18. A, Depress, T3	−.04	−.10	.09	.05	.11*	.05	.14**	.25***	.14**	.22***	−.05	−.13**	−.13*	−.17***	.27***	.55***	.41***	1.00
M (*SD*)	13.32 (1.05)	5.66 (3.27)	1.41 (.31)	1.33 (.27)	.48 (.41)	.40 (.35)	1.85 (.71)	1.94 (.74)	1.75 (.67)	1.83 (.71)	3.84 (.70)	3.86 (.68)	3.77 (.67)	3.78 (.73)	.90 (.58)	1.24 (.71)	1.64 (.50)	1.76 (.58)

Note. Abbreviations beginning with M, F, or A denote mothers, fathers, and adolescents, respectively; Depress = depression; Anx = anxiety; PC = psychological control; Connect = connectedness; T1, T2, or T3 = measurement at Times 1, 2, or 3, respectively.
* $p < .05$. ** $p < .01$. *** $p < .001$.

explored links between parental connection and psychological control (Time 2) and adolescents' depression and anxiety (Time 3). Adolescent age, family income, and structure at the initial time point were used as controls. Moderation as a function of adolescent sex was explored by first comparing a fully unconstrained model (free to vary as a function of adolescent sex) to a fully constrained model. If model fit decreased (determined by a significant Wald test), then paths were constrained as a function of adolescent sex one at a time to determine which paths were contributing to decreases in model fit. Once all constrained paths that contributed to a decrease in model fit were identified, they were left free to vary, whereas all other paths were constrained to be equal. Using this pattern, constraining all paths to be equal as a function of sex resulted in a significant decrease in model fit in both the mother and father models. Thus, we constrained each of the structural paths one at a time to determine the best-fitting model.

Results

Descriptive Statistics and Correlations Between Study Variables

Means, standard deviations, and correlations between all study variables are presented in Table 1. Skew and kurtosis analyses did not suggest any meaningful problems with normality.

Associations Between Parent Mental Health, Parenting, and Adolescent Mental Health

Maternal model. For the maternal parenting model, we determined that seven paths could not be constrained to be equal as a function of adolescent sex (without reduction in model fit via Wald test $p < .05$, see Figure 1). Once these paths were left free to vary, the final model had good model fit ($\chi^2[56] = 88.16$, $p < .01$, comparative fit index = .94, root mean square error of approximation = .062 [.044–.080], Tucker-Lewis Index = .88, standardized root mean square residual = .039). In terms of our first hypothesis, we found that for girls only, maternal anxiety at Time 1 was positively associated with adolescent depression ($\beta = .16$, $p = .02$ for girls; $\beta = -.10$, $p =$ ns. for boys) at Time 3. Results exploring our second hypothesis suggested that for both girls and boys, maternal anxiety at Time 1 was negatively associated with maternal connection at Time 2 ($\beta = -.10$, $p = .032$). For boys only, maternal connection at Time 2 was associated with adolescent anxiety at Time 3 ($\beta = .11$, $p = .079$ for girls; $\beta = -.21$, $p = .001$ for boys) and depression ($\beta = .08$, $p = .211$ for girls; $\beta = -.16$, $p = .020$ for boys). For girls only, maternal psychological control was positively associated with both depression ($\beta = .21$, $p < .001$ for girls; $\beta = .05$, $p =$ ns. for boys) and anxiety ($\beta = .18$ $p = .005$ for girls; $\beta = -.05$, $p =$ ns. for boys). In terms of controls, for both boys and girls, income was associated with lower levels of depression ($\beta = -.11$, $p = .016$), and

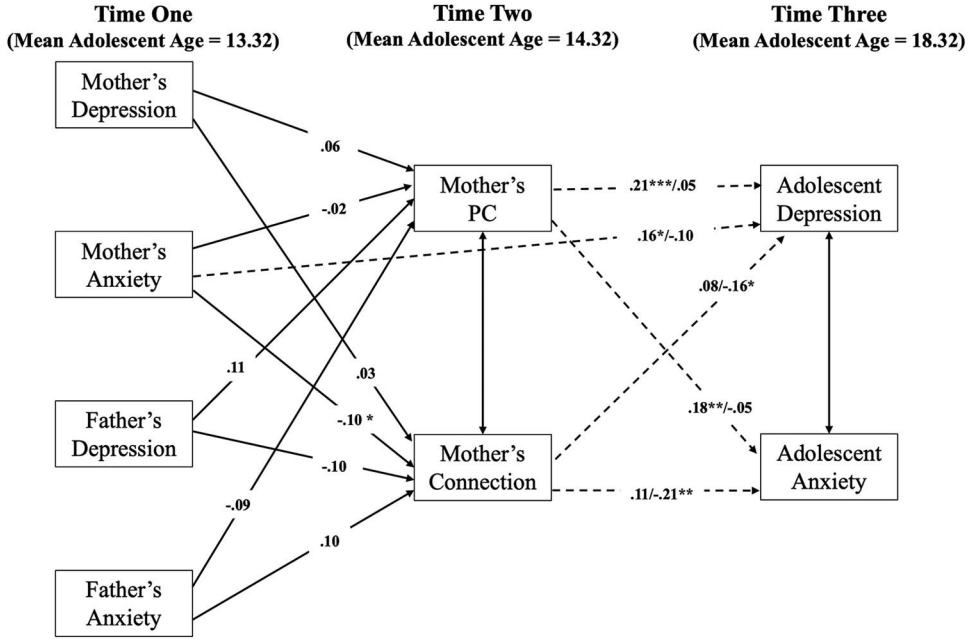

Figure 1. Standardized estimates for relations between parents' anxiety and depression, mothers' parenting, and adolescent mental health. Family income, family structure, ethnicity, adolescent age at Time 1, and depression and anxiety at Time 2 were controlled for but were excluded from the figure for parsimony. Family income predicted less adolescent depression ($\beta = -.11$, $p = .016$) and being European American was negatively associated with psychological control ($\beta = -.13$, $p = .002$). Other controls were not significant. Direct paths from parents' depression and anxiety to adolescents' depression and anxiety were also included in the model; significant pathways are shown, whereas insignificant paths are also not displayed in the figure, for parsimony. Dotted lines show pathways left free to vary, girls/boys. PC = psychological control. * $p < .05$. ** $p < .01$. *** $p < .001$.

being European American was negatively associated with psychological control ($\beta = -.13$, $p = .002$). All stability paths were also statistically significant, including maternal connection ($\beta = .66$, $p < .001$ for girls; $\beta = .51$, $p < .001$ for boys), psychological control ($\beta = .61$, $p < .001$), adolescent depression ($\beta = .37$ $p < .001$), and anxiety ($\beta = .36$, $p < 001$). We explored indirect effects using 2,000 bootstrap samples and 95% confidence intervals using the IND command in MPLUS. None of the indirect effects were statistically significant for mother models (see online supplemental materials).

Paternal model. For the paternal parenting model, we determined that three paths could not be constrained to be equal as a function of adolescent sex (without reduction in model fit via Wald test, $p < .05$, see Figure 2). Once these paths were left free to vary, the final model had good model fit ($\chi^2[61] = 108.90$, $p < .001$, comparative fit index = .93, root mean square error of approximation = .057 [.0397-.075], Tucker-Lewis Index = .88, standardized root mean square residual = .045). In terms of our first hypothesis, there were no significant direct paths between paternal depression or anxiety and adolescent depression or anxiety. To explore our second hypothesis, results suggested that for both boys and girls, fathers' depression ($\beta = -.14$, $p = .041$) and mothers' anxiety ($\beta = -.15$ $p = .008$) were associated with lower levels of paternal connection; and fathers' psychological control was associated with higher levels of adolescent depression ($\beta = .12$, $p = .017$). For girls only, maternal anxiety was associated with higher levels of paternal psychological control ($\beta = .17$, $p < .009$ for girls; $\beta = -.04$, $p =$ ns for boys). In terms of controls, being European American was associated with lower levels of paternal psychological control ($\beta = -.11$, $p < .011$). All stability paths were also statistically significant, including paternal connection ($\beta = .56$, $p < .001$), psychological control ($\beta = .79$, $p < .001$ for girls; $\beta = .58$, $p < .001$ for boys), adolescent depression ($\beta = .31$, $p < .001$), and anxiety ($\beta = .42$, $p < 001$). None of the indirect effects were statistically significant for father models (see online supplemental materials).

Discussion

In the current study, we explored parenting as a possible mediator between parental mental health symptoms and adolescent symptoms 5 years later. Adolescent sex was explored as a moderator and mothers' and fathers' variables were assessed separately. Whereas there was little evidence for significant mediation, our most notable findings pertained to the role of adolescent sex in these relations. Mothers' anxiety predicted adolescent girls' anxious symptoms 5 years later, and moderation by adolescent sex was observed such that maternal harsh parenting was associated with an increase in girls' depression and anxiety, while maternal positive parenting was associated with a reduction in boys' depression and anxiety. Fathers' symptoms did not directly or indirectly predict adolescent symptoms, and when fathers' variables were treated as predictors, no moderation by adolescent sex was observed. Additionally, mothers' symptoms predicted changes in fathers' parenting; fathers' symptoms did not predict changes in mothers' parenting.

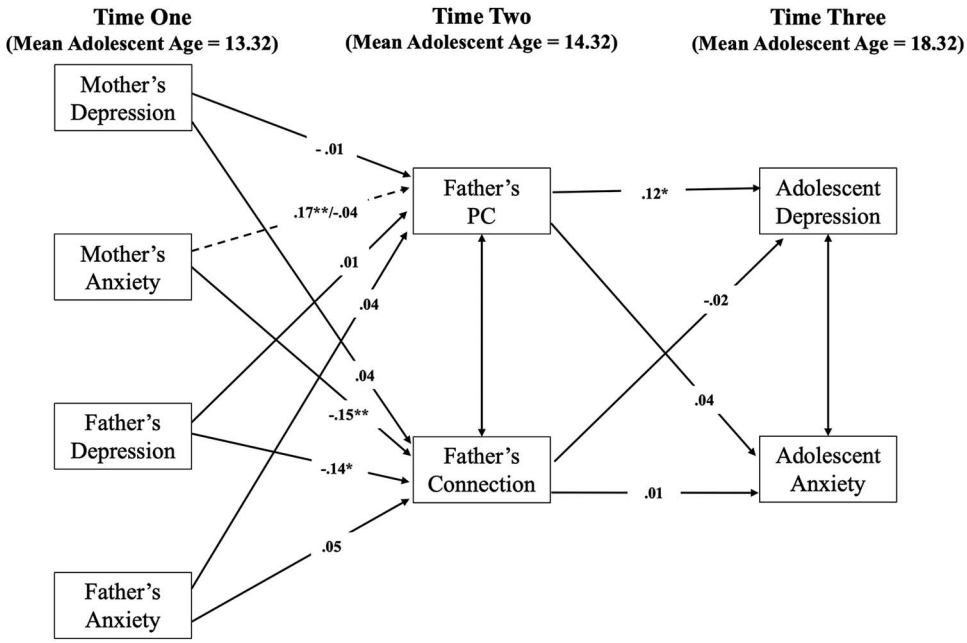

Figure 2. Standardized estimates for relations between parents' anxiety and depression, fathers' parenting, and adolescent mental health. Family income, family structure, ethnicity, adolescent age at Time 1, and depression and anxiety at Time 2 were controlled for but were excluded from the figure for parsimony. Being European American was negatively associated with psychological control ($\beta = -.11$, $p < .011$). No other controls were significant. Direct paths from parents' depression and anxiety to adolescents' depression and anxiety were not significant and are also not displayed in the figure. Dotted lines show pathways left free to vary, whereas solid lines indicate pathways constrained to be equal as a function as adolescent sex, girls/boys. PC = psychological control. * $p < .05$. ** $p < .01$.

These findings do not support our hypothesis that adolescents would be more reactive to the internalizing symptoms and parenting by their parent of their same sex. It is, however, suggested that there is a moderation by adolescent sex such that maternal symptoms and parenting may be a risk factor for girls, whereas maternal parenting is protective for boys. Generally, mothers may be particularly salient for adolescent internalizing outcomes because, even in recent years, mothers report spending much more time than fathers on daily childcare activities (Craig & Jenkins, 2016); adolescents have more exposure to her parenting. In explanation of the moderation by adolescent sex, it has been theorized that adolescent girls are more emotionally reactive to interpersonal stress, perhaps because of physiological differences or self-blame for relationship dysfunction (Rudolph, 2002). It is possible that harsh parenting by the parent with whom children have more exposure is a particularly emotionally difficult experience for girls. Clearly more research is needed to understand the moderating role of parent and adolescent sex in these complex relations.

Finally, although there was not significant mediation, these findings partially support various tenets of the Family Stress Model. For instance, this model posits that parental distress influences not only the parenting of the distressed parent—as was observed—but also the parenting of their partner—as was illustrated by the relationship between mothers' anxiety and fathers' connectedness. Additionally, the model posits that more hostile and less warm parenting may negatively influence adolescent outcomes, which was observed for both parents.

Limitations and Conclusions

Strengths of this study include the use of a longitudinal design as well as including multiple reporters of mental health and parenting behaviors. Despite these strengths, limitations to this study include the use of a nonclinical sample—which may not reflect the impact of clinical symptoms on family outcomes—in addition to a relatively wealthy sample. Additionally, questions about parenting and mental health may have encouraged social desirability in responses, and mothers' and fathers' reports were not counterbalanced because adolescents were asked to report on their primary caregiver first (98% mothers). This may have resulted in adolescents being more accurate about maternal compared with paternal parenting. Finally, the discrepancy in the sample size of mothers and fathers may account for the lack of significant findings with regard to fathers. Despite these limitations, we found that biological sex is an important moderator in relationships surrounding mental health and the family system and that daughters may be particularly susceptible to the symptoms and parenting of their mother.

In sum, our findings suggest that mothers' mental health symptoms and parenting are especially salient to the functioning of the family system; maternal anxiety predicts fathers' parenting as well as girls' depression, and maternal parenting is differentially predictive of adolescent depressive and anxious symptoms for boys and girls. Clinicians working with families and adolescents should be mindful of the ways that mothers' symptoms and parenting may predict adolescents' symptoms as well as the parenting of their partner.

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