

Reciprocal Relationships Between Parent and Adolescent Internalizing Symptoms

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Previous investigations of the association between parent and adolescent internalizing problems have been largely restricted to the unidirectional effect of parent symptoms on their children. This study therefore aimed to investigate potential reciprocal relationships between parent and adolescent internalizing symptoms. One-hundred and seventy-seven adolescents ages 14 to 18 years and their parents (172 mothers, 124 fathers) completed measures of depressive and anxiety symptoms at two time points, 6 months apart. Results supported reciprocity between maternal and adolescent internalizing symptoms but not between paternal and adolescent internalizing symptoms. In addition, the relationship between maternal symptoms and later adolescent symptoms was found to be partially mediated by maternal parenting self-esteem. The study highlights the potential impact of adolescent internalizing problems on maternal well-being, a phenomenon previously neglected in the literature.

Keywords: depression, anxiety, self-esteem, adolescents, parents

Research has consistently reported an association between parent and adolescent internalizing problems (i.e., depression and anxiety; Downey & Coyne, 1990; Hughes & Gullone, 2008). However, a major limitation of existing research in this area is that hypotheses have been largely restricted to the unidirectional effect of parent symptomatology on offspring with little or no consideration given to potential reciprocal effects. Given that internalizing disorders are the most prevalent psychiatric disorders encountered during both adolescence and adulthood (Demyttenaere et al., 2004; Roberts, Roberts, & Chan, 2009), understanding the ways in which parent and adolescent internalizing problems may interact and contribute to the precipitation, maintenance, or exacerbation of such problems poses an important area for investigation.

Since Bell's (1968) landmark article on child effects in socialization processes, theoretical considerations of reciprocity in parent–child relations have been well documented. These include Sameroff's (1975) transactional models of early social relations and Patterson's (1982) coercive family process model of child behavior problems. In addition, one of the key principles of family systems theory is the reciprocal nature of interactions between family members (Minuchin, 1985), with the identification of family interaction cycles considered to be of critical importance to understanding and treating psychopathology

(Cowan & Cowan, 2006; Minuchin, 1985). Theoretical models of reciprocity in parent–child relations are gaining empirical support from a growing body of research, particularly in regard to parenting practices and child behavior problems. For example, Pardini, Fite, and Burke (2008) reported that parenting practices such as involvement, communication, and punishment both predicted, and were predicted by, child conduct problems.

Although the potential effect of adolescents' functioning on their parents' functioning has been examined in areas such as substance use (Stice & Barrera, 1995) and behavior problems (Burke, Pardini, & Loeber, 2008), only one study could be found that has investigated the effect of adolescent internalizing problems on parent internalizing problems (Ge, Conger, Lorenz, Shanahan, & Elder, 1995). In this study, parent symptoms not only predicted adolescent symptoms one to two years later, but adolescent symptoms predicted later parent symptoms. These reciprocal relationships were found between mothers and sons in early adolescence and between fathers and daughters in later adolescence. Related studies have reported reciprocal relationships between adolescent internalizing symptoms and other family factors such as parent support (Slavin & Rainer, 1990) and attachment (Buist, Dekovic, Meeus, & van Aken, 2004), and one study with children ages 4 to 11 years has reported reciprocal relations between maternal depressive symptoms and child emotional problems over 4 years (Elgar, Curtis, McGrath, Waschbusch, & Stewart, 2003).

Given the sparsity of contemporary research investigating reciprocity in relationships between parent and adolescent internalizing symptoms, the primary aim of the current study was to examine such relationships in a community sample of adolescents and their parents over a 6-month

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period. Adolescence is characterized by a marked increase in internalizing symptoms and disorders (McGee, Feehan, Williams, & Anderson, 1992). Thus, this may be a critical period during which parental influences on well-being manifest and during which declines in adolescent well-being impact upon parents. On the basis of previous research together with theoretical considerations, it was hypothesized that parent internalizing symptoms would predict later adolescent internalizing symptoms, and that adolescent internalizing symptoms would predict later parent internalizing symptoms.

The study further expanded on previous research investigating parent and adolescent symptom relationships by examining both mothers and fathers. Previous studies have predominantly included only mothers (e.g., Spence, Najman, Bor, O'Callaghan, & Williams, 2002) or have reported combined data from mothers and fathers (e.g., Biederman et al., 2001). Given women's increased propensity for internalizing problems (Kramer, Krueger, & Hicks, 2008) and the tendency for mothers to be the primary caregiver, it may be expected that relationships would be stronger for mother-adolescent dyads than for father-adolescent dyads. However, results from previous studies with adolescents have been inconsistent, with significant associations between parent and adolescent symptoms reported for mothers only (McClure, Brennan, Hammen, & Le Brocque, 2001), fathers only (Compas, Howell, Phares, Williams, & Ledoux, 1989), or both parents (Cooper, Fearn, Willetts, Seabrook, & Parkinson, 2006; Thomas & Forehand, 1991). Furthermore, a meta-analysis yielded results showing that although maternal and paternal psychopathology were both related to child and adolescent internalizing problems, associations for maternal psychopathology were stronger during childhood, whereas associations for paternal psychopathology were stronger during adolescence (Connell & Goodman, 2002). Given these inconsistencies, no specific hypotheses could be made regarding differences between mothers and fathers.

Also expanding on previous research, a second aim of the study was to examine the potential mediating role of parenting self-esteem. Examining mechanisms by which risk for internalizing problems is transferred between parents and adolescents is important for understanding the nature of these problems and identifying targets for prevention and intervention. A number of mechanisms that may transmit risk of depression from parent to child have been identified, including poor attachment, inadequate parenting, and modeling of dysfunctional cognitions and behaviors (Goodman & Gotlib, 1999; Joormann, Eugene, & Gotlib, 2009). The current study examined parenting self-esteem because this factor is relevant to bidirectional transmission of risk and, despite theoretical support for its association with parent and child psychological well-being, empirical investigations are notably sparse, particularly regarding internalizing symptoms and the adolescent period. Furthermore, parenting self-esteem may provide a novel target for parent-centered interventions.

Parenting self-esteem encompasses both affective and cognitive attitudes toward parenting, including satisfaction

derived from parenting and perceived self-efficacy as a parent (Johnston & Mash, 1989). Parenting satisfaction reflects feelings such as pleasure, fulfillment, and motivation experienced in the parenting role (Guidubaldi & Cleminshaw, 1985; Sabatelli & Waldron, 1995). Parenting self-efficacy refers to parents' beliefs about their competence as a parent, including parents' perceived ability to deal effectively with their child's problems and to influence their child's behavior and development in a positive way (Coleman & Karraker, 2000; Johnston & Mash, 1989). Parenting satisfaction and efficacy are thought to be intrinsically related, in that it is difficult to develop competency in an endeavor one derives no satisfaction from, just as it is difficult to derive satisfaction from an endeavor in which one believes that they have no competence (Coleman & Karraker, 1998).

In line with proposals regarding the impact of child behavior problems on parents (e.g., Fite, Colder, Lochman, & Wells, 2006), it is conceivable that adolescent internalizing symptoms impact negatively upon parenting self-esteem. Symptoms such as withdrawal, fearfulness, and somatic complaints are likely to be frustrating for parents and may make it difficult for them to derive pleasure from parent-child interactions. Parents may also blame themselves for their child's problems or for not being able to help their child, leading them to question their abilities as a parent. Diminished satisfaction and efficacy may, in turn, be associated with elevated parent internalizing symptoms due to increased negative affect and decreased positive affect as well as general self-esteem. Likewise, it is conceivable that parents who are experiencing anxiety and depression may have lowered parenting self-esteem due to a tendency toward negative evaluations about one's skills and abilities and a reduced interest in and enjoyment of daily life. Adolescent well-being may in turn be impacted by lowered parenting self-esteem via parents' withdrawal from parent-child interactions or increased expression of negative affect in interactions leading to adolescents feeling vulnerable or unloved and thus contributing to their own mental health problems.

Although studies with adolescents are scarce, a growing body of research with children supports the potential mediating role of parenting self-esteem in the relationship between parent and child well-being. Specifically, a number of studies have reported lower parent satisfaction and efficacy to be associated with both difficult child behavior (Donenberg & Baker, 1993; Johnston & Mash, 1989; Lovejoy, Verda, & Hays, 1997; Ohan, Leung, & Johnston, 2000; Rogers & Matthews, 2004) and greater parent distress, including negative affect and symptoms of depression and anxiety (Gondoli & Silverberg, 1997; Lovejoy et al., 1997; Ohan et al., 2000; Rogers & Matthews, 2004). Furthermore, Cutrona and Troutman (1986) reported that parenting efficacy mediated the relationship between difficult infant temperament and elevated maternal depressive symptoms in the postpartum period. On the basis of this research, in the current study it was hypothesized that relationships between parent and adolescent internalizing symptoms would be mediated by parenting self-esteem.

Method

Participants and Procedure

The study took place in the state of Victoria, Australia. It was approved by the institutional ethics committee, state Department of Education, and Catholic Education Office. Participants were recruited through secondary schools and university email bulletins. Voluntary informed consent was provided in writing by parents and adolescents. Of the 277 adolescents that completed questionnaires at Time 1 (T1), 84% completed questionnaires at school, and the remaining adolescents (i.e., recruited via advertisements or absent from school) were mailed questionnaires to complete at home. There were no significant differences between measures completed at school and at home ($p > .05$). The overall response rate was unable to be calculated as the total number of parents receiving information about the study was unknown. Two-hundred and nineteen adolescents (79%) had at least one parent who completed parent questionnaires by mail at T1 (212 mothers and 156 fathers). At Time 2 (T2), 6 months later, 180 of the 219 families (82%) had at least one member who completed follow-up questionnaires by mail. Three families were excluded because the adolescents were no longer living with their parents ($n = 2$) or the questionnaires were inadequately completed ($n = 1$). The final sample for analysis comprised 172 mother-adolescent dyads and 124 father-adolescent dyads. Of the 177 adolescents included, 120 had both parents as participants, 52 had only their mother participate, and 5 had only their father participate. Sample characteristics are shown in Table 1.

Measures

Adolescent internalizing symptoms. At T1 and T2, adolescents reported their depressive and anxiety symptoms

with the Reynolds Adolescent Depression Scale—Second Edition (RADS-2; W. M. Reynolds, 2002) and the Revised Children's Manifest Anxiety Scale (RCMAS; C. R. Reynolds & Richmond, 1985). The RADS-2 consists of 30 statements rated on a 4-point scale indicating the frequency with which depressive symptoms are experienced (1 = *almost never*, 4 = *most of the time*). It has high internal consistency ($\alpha = .92$), high test-retest reliability ($r = .77-.84$), and convergent validity with other measures of depression and adolescent well-being (W. M. Reynolds, 2002). The RCMAS comprises 28 items assessing anxiety symptoms. Adolescents indicate whether each item is true of them (0 = *no*, 1 = *yes*). It has high internal consistency ($\alpha = .80-.83$), high test-retest reliability ($r = .98$), and convergent validity with measures of child trait anxiety (C. R. Reynolds & Richmond, 1985). Both the RADS-2 and RCMAS demonstrated high internal consistency in the current study ($\alpha = .86-.95$).

Parents reported adolescent internalizing symptoms at T1 and T2 using the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). The CBCL internalizing scale comprises three subscales (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) totaling 26 items. Parents rate each symptom on a 3-point scale indicating how true it is of their child (0 = *not true*, 2 = *very true or often true*). The scale has been reported to have high internal consistency ($\alpha = .90$) and test-retest reliability ($\alpha = .70-.91$; Achenbach & Rescorla, 2001). Extensive validation studies have found the CBCL to discriminate well between clinically referred and nonreferred children and to correlate highly with other measures of child and adolescent well-being (Achenbach & Rescorla, 2001). The CBCL demonstrated high internal consistency in the current study ($\alpha = .88-.91$).

RADS-2, RCMAS, and CBCL *T* scores based on manual norms for age and sex were used in all analyses. This allowed some control for potential age and sex differences

Table 1
Characteristics of Sample

Characteristic	Adolescents	Mothers	Fathers
<i>N</i>	177	172	124
Male adolescent, <i>n</i> (%) ^a	71 (40)	69 (40) ^b	47 (38)
Female adolescent, <i>n</i> (%)	106 (60)	103 (60)	77 (62)
Age in years, <i>M</i> (<i>SD</i>) at Time 1	15.7 (1.1) ^c	45.6 (5.1)	48.0 (5.9)
Age, range at Time 1	14.0–18.7	29.4–66.8	37.2–78.0
Demographic (Time 1)			
Australian born, <i>n</i> (%)	161 (93)	105 (72)	90 (73)
Tertiary degree or higher, <i>n</i> (%)	—	56 (33)	49 (40)
Occupational prestige, ^d <i>M</i> (<i>SD</i>)	—	54.1 (23.8)	57.0 (21.9)
Occupational prestige, range	—	17.7–100	12.4–100
Income \geq AUD\$75,000, <i>n</i> (%)	—	7 (4)	47 (38)
Relationship to adolescent, <i>n</i> (%)			
Biological parent	—	165 (96)	116 (94)
Stepparent	—	5 (3)	7 (6)
Other ^e	—	2 (1)	1 (1)

^a Valid percentage used throughout table. ^b Indicates sex of target adolescent, for example; 40% were mothers of male adolescents at Time 1. ^c Adolescent age values were identical for the total adolescent, mother, and father samples. ^d Scored using the Australian-based ANU4 scale, which ranges from 0 to 100 (reported means: men, $M = 47$, $SD = 23$; women, $M = 49$, $SD = 23$; F. L. Jones & J. McMillan, 2001). ^e Includes adoptive parents, foster parents, and grandparents.

without compromising statistical power given the modest sample size.

Parent internalizing symptoms. At T1 and T2, parents reported their own depressive and anxiety symptoms using the Depression Anxiety Stress Scales (DASS; S. H. Lovibond & P. F. Lovibond, 1995). This measure consists of 42 statements reflecting symptoms of depression, anxiety, and stress in adults. Each statement is rated on a 4-point scale indicating how much the statement applied during the past week (0 = *did not apply to me at all*, 3 = *applied to me very much or most of the time*). The Depression (DASS-D) and Anxiety (DASS-A) scales analyzed in this study have high internal consistency ($\alpha = .84-.91$; S. H. Lovibond & P. F. Lovibond, 1995) and test-retest reliability ($r = .71$ to $.79$; T. A. Brown, Chorpita, Korotitsch, & Barlow, 1997). Validity has been supported by their high correlations with the Beck Depression Inventory ($r = .74$) and Beck Anxiety Inventory ($r = .81$), respectively (P. F. Lovibond & S. H. Lovibond, 1995), and the tendency for higher mean scores to be reported for clinical samples in comparison with nonclinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS demonstrated high internal consistency in the current study ($\alpha = .76-.95$).

Parenting self-esteem. Parents reported parenting self-esteem with the Parenting Sense of Competency Scale (PSOC; Gibaud-Wallston & Wandersman, 1978, cited by Johnston & Mash, 1989). This measure consists of a 9-item Satisfaction scale (PSOC-S; e.g., "Being a parent makes me tense and anxious") and a 7-item Efficacy scale (PSOC-E; e.g., "Being a parent is manageable and any problems are easily solved"). Parents were instructed to respond with regard to their parenting of the target child. Items are rated on a 6-point scale (1 = *strongly agree*, 6 = *strongly disagree*), with higher scale scores indicating greater satisfaction and efficacy. The PSOC has been reported to have good internal consistency ($\alpha = .75-.76$; Johnston & Mash, 1989), and validity has been demonstrated via significant correlations with other measures of life satisfaction (Coleman & Karraker, 2000; Ohan et al., 2000) and efficacy (Coleman & Karraker, 2000). Consistent with past studies (e.g., Coleman & Karraker, 2000), PSOC-S and PSOC-E scores were highly correlated in the current study ($r = .49-.66$, $p < .001$) and demonstrated high internal consistency ($\alpha = .77-.86$).

Results

Preliminary Analyses and Descriptives

Data were screened for integrity prior to analysis. Case mean substitution was used to impute missing items when less than 10% of items were missing for a single scale (less than 0.5% of data). Respondents and nonrespondents were compared using t tests and χ^2 tests. Regarding parental participation at T1, adolescents whose parents participated were slightly older than were adolescents whose parents did not participate ($M = 15.7$, $SD = 1.3$, vs. $M = 15.4$, $SD = 1.1$; $t(275) = 2.3$, $p < .05$, Cohen's $d = .31$). With regard to follow-up participation, families who participated at T2 had

lower paternal occupational prestige ($M = 57.5$, $SD = 22.1$, vs. $M = 68.6$, $SD = 19.2$), $t(159) = -2.55$, $p < .05$, Cohen's $d = .52$, higher maternal PSOC-S ($M = 41.0$, $SD = 6.5$, vs. $M = 38.3$, $SD = 6.2$), $t(209) = 2.39$, $p < .05$, Cohen's $d = .42$, and higher paternal PSOC-S ($M = 41.1$, $SD = 6.6$, vs. $M = 37.9$, $SD = 6.2$), $t(153) = 2.51$, $p < .05$, Cohen's $d = .51$, than did families who did not participate at T2.

Means, standard deviations, and intercorrelations for adolescent and parent symptoms and parenting self-esteem are presented in Table 2. The proportion of cases who reported symptom levels in the clinical range at T1 or T2 were as follows: 11% to 15% for the RADS-2 and RCMAS (T score ≥ 60); 9% to 13% for the CBCL (T score ≥ 64); 4% to 12% for maternal DASS; and 2% to 9% for paternal DASS (DASS-D ≥ 10 ; DASS-A ≥ 8). As can be seen in Table 2, the correlations indicated that, with some exceptions, parent and adolescent symptoms were related over time. All significant correlations were small to moderate in size.

Structural Equation Modeling of Parent and Adolescent Symptoms

Hypotheses were tested with structural equation modeling (SEM) using maximum likelihood estimation in AMOS 17.0. In addition to the chi-squared test, minimal requirements for adequate SEM model fit were as follows: chi-squared to degrees of freedom ratio (χ^2/df) less than 2.0 (Ullman, 2001), root mean square error of approximation (RMSEA) less than .08 (.05-.08 reasonable fit; $\leq .05$ good fit; Browne & Cudeck, 1993), and comparative fit index (CFI) and Tucker-Lewis index (TLI) values greater than .90 ($\geq .90$ reasonable fit; $\geq .95$ good fit; Hu & Bentler, 1998).

A structural equation model tested cross-lagged associations between parent and adolescent symptoms after controlling for initial symptom levels (see Figure 1). The model was evaluated for mother-adolescent and father-adolescent dyads separately. For mother-adolescent dyads, maternal DASS-D and DASS-A were entered as indicators of the latent variable *Parent Internalizing Symptoms*, and RADS-2, RCMAS, and paternal-reported CBCL were entered as indicators of the latent variable *Adolescent Internalizing Symptoms*. Maternal-reported CBCL was not entered as an indicator in the mother-adolescent model, because parent reports of their children's symptoms may be confounded by the parents' own symptomatology (e.g., Treutler & Epkins, 2003). Similarly, for the father-adolescent model, paternal DASS-D and DASS-A were entered as indicators of the latent variable *Parent Internalizing Symptoms*, and RADS-2, RCMAS, and maternal-reported CBCL were entered as indicators of the latent variable *Adolescent Internalizing Symptoms*. Measurement models confirmed the appropriateness of the indicators for each latent variable. In the final models, measurement errors were allowed to correlate over time. Residual errors of the latent constructs at T2 were also allowed to correlate. These correlations are not shown herein.

For mother-adolescent dyads, there was good model fit, $\chi^2(28) = 37.97$, $p > .05$; $\chi^2/df = 1.36$; RMSEA = .05;

Table 2
Means, Standard Deviations, and Pearson's Correlations of Time 1 and Time 2 Adolescent and Parent Measures

Time 2	Time 1										Mean (SD)	
	RADS-2	RCMAS	CBCL ^m	CBCL ^p	DASS-D ^m	DASS-A ^m	DASS-D ^p	DASS-A ^p	PSOC-S ^m	PSOC-E ^m		PSOC-S ^p
RADS-2	.75***	.56***	.42***	.40***	.40***	.23**	.19*	.13	-.36***	-.27***	-.28***	.01
RCMAS	.65***	.70***	.37***	.23	.23	.13	.07	.06	-.32***	-.20***	-.22**	-.01
CBCL ^m	.45***	.31***	.72***	.30***	.35***	.27***	-.02	-.01	-.34***	-.22**	-.16*	-.18*
CBCL ^p	.33***	.25***	.43***	.28	.28	.23	.18*	.31***	-.20*	-.27***	-.32***	-.20*
DASS-D ^m	.33***	.19**	.60***	.32***	.39***	.44***	-.08	-.02	-.39***	-.21**	-.14	-.10
DASS-A ^m	.00	-.01	.21**	.32***	.45***	.41***	-.11	-.03	-.27***	-.10	-.16*	-.17*
DASS-D ^p	.10	-.04	.07	.13	.11	.64***	.64***	.58***	-.25**	-.25**	-.35***	-.17*
DASS-A ^p	.16*	.09	.16*	.13	.14	.14	.25	.38	-.25**	-.22**	-.22**	-.14
PSOC-S ^m	-.24**	-.20**	-.42***	-.45***	-.30***	-.30***	-.12	-.01	.71***	.45***	.33***	.34***
PSOC-E ^m	-.17*	-.13	-.22**	-.26***	-.15*	-.15*	-.09	-.09	.43***	.68***	.14	.23
PSOC-S ^p	-.14	-.12	-.13	-.19*	-.21*	-.21*	-.42***	-.43***	.41***	.34***	.76***	.48***
PSOC-E ^p	-.01	-.03	-.21*	-.23**	-.16*	-.16*	-.05	-.11	.31***	.38***	.55***	.69***
Mean (SD)	47.4 (11.0)	47.6 (10.7)	49.2 (10.7)	47.1 (10.3)	3.27 (5.16)	1.56 (3.53)	2.91 (4.49)	1.23 (2.19)	41.1 (6.6)	31.0 (5.1)	41.4 (6.4)	29.5 (5.4)

Note. RADS-2 = Reynolds Adolescent Depression Scale-2; RCMAS = Revised Children's Manifest Anxiety Scale; CBCL = Child Behavior Checklist; DASS-D = Depression Anxiety Stress Scales-Depression; DASS-A = DASS-Anxiety; PSOC-S = Parent Sense of Competency Scale-Satisfaction; PSOC-E = PSOC-Efficacy; SD = standard deviation; superscript m = maternal; superscript p = paternal.
* $p < .05$. ** $p < .01$. *** $p < .001$.

CFI = .99; TLI = .97 with error variances for maternal depressive symptoms at T1 and T2 held positive (Wothke, 1993). Maternal internalizing symptoms were stable from T1 to T2 ($\beta = .58, p < .001$), as were adolescent internalizing symptoms ($\beta = .77, p < .001$). Consistent with hypotheses, higher levels of maternal internalizing symptoms at T1 significantly predicted higher levels of adolescent internalizing symptoms at T2 ($\beta = .13, p < .05$) and higher levels of adolescent internalizing symptoms at T1 significantly predicted higher levels of maternal internalizing symptoms at T2 ($\beta = .16, p < .05$).

The model for father-adolescent dyads also demonstrated good fit, $\chi^2(26) = 35.43, p > .05; \chi^2/df = 1.36; RMSEA = .05; CFI = .98; TLI = .97$. Paternal internalizing symptoms were stable from T1 to T2 ($\beta = .64, p < .001$), as were adolescent internalizing symptoms ($\beta = .84, p < .001$). However, paternal internalizing symptoms at T1 were unrelated to adolescent internalizing symptoms at T2 ($\beta = .03, p > .05$), and adolescent internalizing symptoms at T1 were unrelated to paternal internalizing symptoms at T2 ($\beta = -.02, p > .05$).

Mediation Model for Parenting Self-Esteem

The mediating role of maternal parenting self-esteem was evaluated following guidelines set out by Holmbeck (1997). As was recommended by Cole and Maxwell (2003) for two-wave models, two latent variables—*Parenting Self-Esteem at T1* and *Parenting Self-Esteem at T2* (indicators: PSOC-S and PSOC-E) were added to the previous maternal model, and associations were tested between symptoms at T1 and parenting self-esteem at T2, and between parenting self-esteem at T1 and symptoms at T2 (see Figure 2). This model demonstrated good fit, $\chi^2(59) = 76.05, p > .05; \chi^2/df = 1.29; RMSEA = .04; CFI = .99; TLI = .98$. The direct relationships between maternal symptoms at T1 and adolescent symptoms at T2 and between adolescent symptoms at T1 and maternal symptoms at T2 were no longer significant ($\beta = .07, p > .05$, and $\beta = .12, p > .05$, respectively). Providing initial support for mediation, there were significant negative associations between maternal symptoms at T1 and parenting self-esteem at T2 ($\beta = -.15, p < .05$) and between parenting self-esteem at T1 and adolescent symptoms at T2 ($\beta = -.13, p < .05$).

To examine this further, we compared the (unconstrained) model with a nested model in which the direct maternal-adolescent symptom relationships were constrained to zero. This model also demonstrated good fit, $\chi^2(61) = 80.43, p = .05; \chi^2/df = 1.32; RMSEA = .04; CFI = .99; TLI = .97$. Comparison of the two models revealed that the chi-squared difference test was not significant, $\Delta\chi^2(2) = 4.38, p > .05$. This indicated that the direct relationships did not improve the model, thereby supporting mediation (Holmbeck, 1997). Comparing the beta coefficients of the direct effect when parenting self-esteem was included in the model and when it was excluded from the model indicated that the effect size for the relationship between maternal symptoms at T1 and adolescent symptoms at T2 was reduced by 46% (calculated as $.13-.07/.13$).

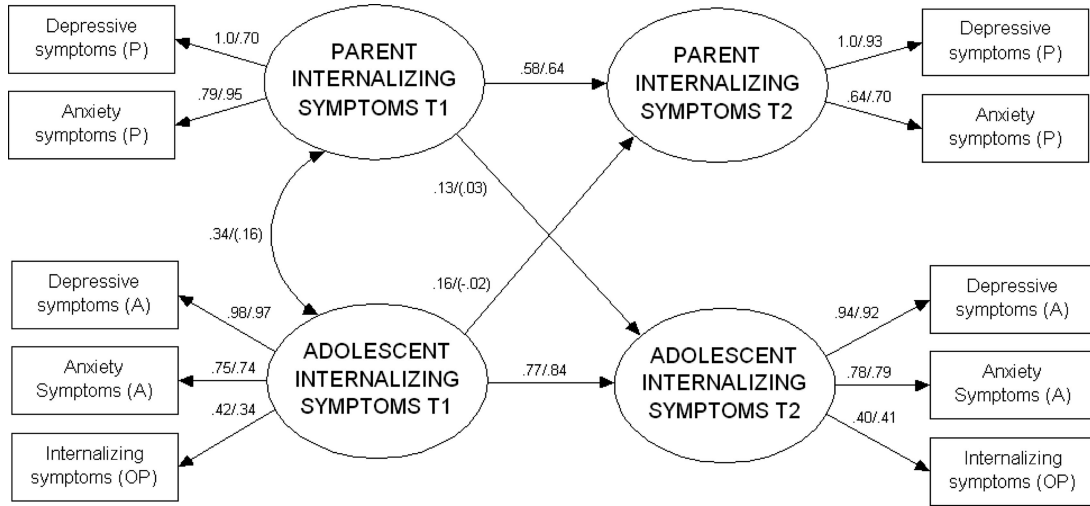


Figure 1. Structural equation model of reciprocal relationships between parent and adolescent internalizing symptoms. Reporters of indicator variables were P = target parent, A = adolescent, and OP = other parent. Coefficients are standardized values for mother-adolescent dyads and father-adolescent dyads. Nonsignificant coefficients ($p > .05$) are in parentheses.

Using Freedman and Schatzkin's (1992) method as recommended by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), we found that the indirect effect was significant, $t(170) = 1.83, p < .05$. Thus, parenting self-esteem functioned as a mediator of the relationship between maternal internalizing symptoms at T1 and adolescent internalizing symptoms at T2.

In contrast, mediation was not supported in the relationship between adolescent internalizing symptoms at T1 and maternal internalizing symptoms at T2. Specifically, although the relationship between parenting self-esteem at T1 and maternal symptoms at T2 was significant in the mediation model ($\beta = -.19, p < .05$), the relationship between adolescent symptoms at T1 and self-esteem at T2 was not significant ($\beta = .01, p > .05$).

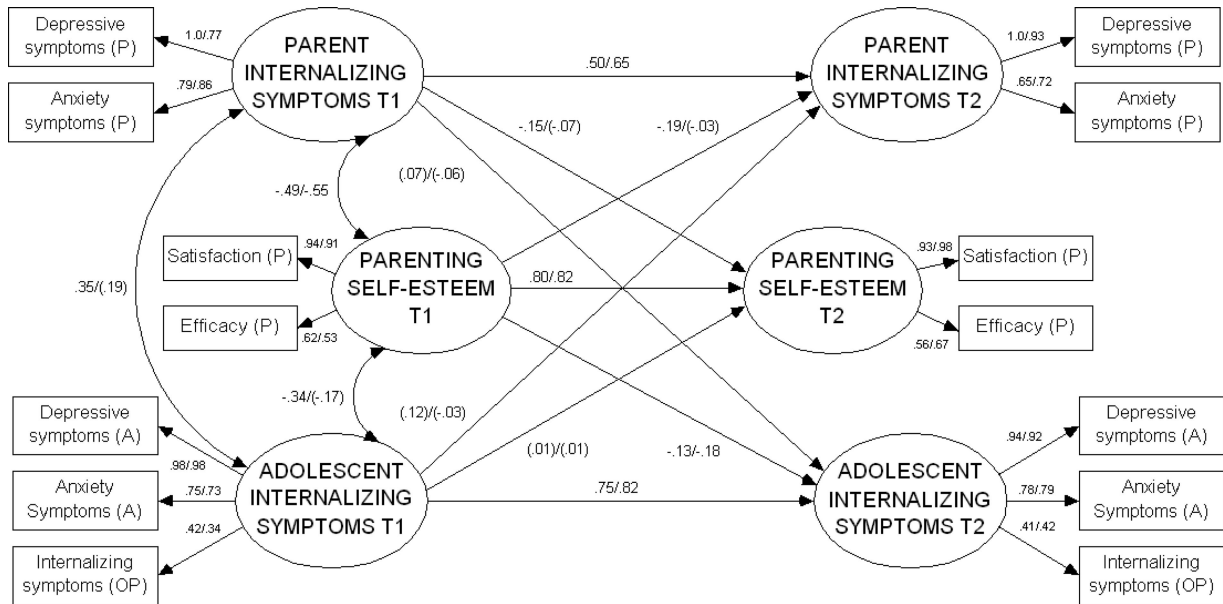


Figure 2. Structural equation model of reciprocal relationships between parent and adolescent internalizing symptoms mediated by parenting self-esteem. Reporters of indicator variables were P = target parent, A = adolescent, and OP = other parent. Coefficients are standardized values for mother-adolescent dyads and father-adolescent dyads. Nonsignificant coefficients ($p > .05$) are in parentheses.

Although the father–adolescent model did not meet the first criterion for testing mediation effects (i.e., there were no significant direct relationships between father and adolescent symptoms over time), indirect effects via parenting self-esteem could still be examined (Holmbeck, 1997). The model depicted in Figure 2 for father–adolescent dyads demonstrated adequate fit, $\chi^2(58) = 92.64, p < .05; \chi^2/df = 1.60; RMSEA = .07; CFI = .96; TLI = .93$. However, paternal and adolescent symptoms at T1 were not significantly associated with parenting self-esteem at T2 ($\beta = -.07, p > .05$, and $\beta = .01, p > .05$, respectively), and parenting self-esteem at T1 was not significantly associated with paternal symptoms at T2 ($\beta = -.03, p > .05$). Nevertheless, there was a significant negative association between parenting self-esteem at T1 and adolescent symptoms at T2 ($\beta = -.18, p < .05$).

Discussion

The study provided support for the hypothesis that maternal and adolescent internalizing symptoms would be reciprocally related and provided partial support for the hypothesis that these relationships would be mediated by parenting self-esteem. However, the findings did not provide support for reciprocal relationships between paternal and adolescent symptoms.

The finding that maternal symptoms prospectively predicted adolescent symptoms is consistent with past research that has frequently reported significant associations between maternal and adolescent internalizing problems (Hughes & Gullone, 2008). Moreover, the additional finding that adolescent symptoms prospectively predicted maternal symptoms is consistent with theoretical models (e.g., Minuchin, 1985) and past research regarding reciprocal parent–child relations (e.g., Burke et al., 2008; Slavitt & Rainer, 1990). These findings are particularly noteworthy given that very few studies have prospectively examined reciprocal parent–child internalizing symptoms (Elgar et al., 2003) and just one has studied adolescents (Ge et al., 1995). Although causative conclusions must remain speculative, the findings provide relatively unique contemporary support for the putative effect of adolescent internalizing symptoms on maternal risk for internalizing symptoms. Such findings imply that empirical and theoretical frameworks that primarily focus on the antecedents of adolescent internalizing problems may be significantly enhanced by integrating the potential consequences of adolescent internalizing symptoms for other family members.

Further expanding on past research, the study found that the relationship between maternal symptoms and later adolescent symptoms was partially mediated by maternal parenting self-esteem. These findings are consistent with previous research on correlates of parenting self-esteem (e.g., Lovejoy et al., 1997; Ohan et al., 2000; Rogers & Matthews, 2004) and lend support to the hypothesis that elevated internalizing symptoms in mothers may lead to elevated symptoms in adolescents via lowered parenting self-esteem. It should be noted, however, that relationships between parenting self-esteem and maternal and adolescent internal-

izing symptoms are likely to reflect pre-existing, ongoing, and potentially reciprocal processes. Indeed, reciprocity was also observed between maternal internalizing symptoms and parenting self-esteem, in that each significantly predicted the other over time. As such, it is important to keep in mind that the model presented here is likely to be a snapshot of these putative processes.

Notably, parenting self-esteem only partially accounted for the relationship between maternal symptoms and later adolescent symptoms and did not mediate the relationship between adolescent symptoms and later maternal symptoms. This indicates that there are other mechanisms that may account for these relationships (Goodman & Gotlib, 1999; Joormann et al., 2009). Furthermore, adolescent internalizing symptoms did not predict later maternal parenting self-esteem, although there was a significant negative cross-sectional relationship between adolescent symptoms and parenting self-esteem. Perhaps any influence of adolescent symptoms on parenting self-esteem has already taken effect by this age or takes effect over a longer period than that studied.

Paternal internalizing symptoms were not found to predict, or be predicted by, adolescent internalizing symptoms in the multivariate analyses. This finding is consistent with some previous studies (McClure et al., 2001) but contrasts with the findings of others (Compas et al., 1989; Cooper et al., 2006). Given the smaller sample size for father–adolescent dyads and that there were only small bivariate correlations between paternal and adolescent symptoms over time, it may be that there was insufficient power to detect small relationships between paternal and adolescent symptoms in the multivariate analyses. It is also possible that the timing of follow-up was inappropriate or that adolescent sex moderated the relationship between paternal and adolescent symptoms, a factor that was not able to be explored in the current study because of limited sample size. Previous findings have been mixed in regard to sex differences, with some studies reporting paternal symptoms to be related to daughters' but not to sons' symptoms (Ge et al., 1995) and with others reporting the opposite pattern (Thomas & Forehand, 1991).

Methodological issues aside, the finding that maternal but not paternal symptoms were significant may be explained in a number of ways. For example, fathers may be less likely to express their emotional problems to family members. Indeed, adult men are more likely to suppress emotional expression than are adult women (Gross & John, 2003). The amount of time fathers spend with their children may also be a factor, in that fathers are less likely to be the primary caregiver and tend to spend more time away from their children. Thus they may be less likely to influence and be influenced by their child's functioning. Fathers may also be less attuned to, and consequently less affected by, the emotional well-being of others, a factor highlighted in the empathy literature (Zahn-Waxler, 2000). Alternatively, fathers may be more resilient when exposed to others' symptoms or may be affected in different ways, for example, by externalizing their distress. This latter argument is consistent with the robust finding that women are prone to internaliz-

ing problems, whereas men are prone to externalizing problems (Kramer et al., 2008).

Of interest, although the study findings did not support indirect effects between paternal and adolescent symptoms via paternal parenting self-esteem, paternal parenting self-esteem at T1 significantly predicted adolescent internalizing symptoms at T2. These findings suggest that poor paternal parenting self-esteem may have adverse consequences for adolescent well-being and that paternal parenting self-esteem is determined by factors other than paternal and adolescent internalizing symptoms (e.g., externalizing problems and personality). However, cross-sectional relationships in the model for paternal parenting self-esteem seem to contradict this; at T1, paternal parenting self-esteem did not correlate with adolescent symptoms but did correlate with paternal symptoms. Larger longitudinal studies that examine these relationships further and include a broader range of factors are clearly needed.

Other limitations of the current study require acknowledgment. First, although elevated symptomatology can impact significantly upon individual functioning (Gotlib, Lewinsohn, & Seeley, 1995) and may be a precursor to later disorder (Cuijpers & Smit, 2004), the current findings might not generalize to clinical populations. In addition to quantitative differences related to the severity of symptoms experienced by individuals with diagnosable internalizing disorders in comparison with those with subclinical problems, there may also be important qualitative differences. Moreover, although a number of adolescents in the current study had elevated symptom levels, there were relatively fewer parents with elevated levels. Thus, there may not have been sufficient variance in severity of parent symptoms in the current study.

Second, although the sample was recruited from the community, thereby increasing potential representativeness, families who agreed to be involved were generally of middle to high socioeconomic status. Furthermore, parents who participated at follow-up reported lower father occupational prestige and greater parenting satisfaction than did those who did not report these. It may be, for example, that a loss to follow-up of parents with lower parenting satisfaction curtailed the study findings regarding parenting self-esteem. These factors need to be taken into account when considering the generalizability of the results to more diverse populations.

Third, while the study extended previous research by examining reciprocal relationships between parent and adolescent symptoms, it is likely that extraneous factors were impacting upon parents and adolescents at different times (e.g., common family stressors). In addition, genetic factors may cause parent and adolescent symptoms to correlate over time. Therefore, although there appear to be reciprocal relationships between maternal and adolescent symptoms, other explanations cannot be ruled out. Finally, although two-wave mediation models that test prospective relationships are superior to those that test contemporaneous relationships (Cole & Maxwell, 2003), a three-wave model would have provided a more rigorous test of temporal relationships between variables. However, as has been pre-

viously noted, relationships between the studied variables are likely to involve ongoing interactive processes. It is only through randomized intervention designs that the temporal ordering of effects and the significance of mediating variables can be adequately tested (MacKinnon, 2008) and are therefore recommended for future research.

Notwithstanding these limitations, the current study has a number of strengths and makes an important contribution to the literature. It is one of the few existing studies to have examined reciprocal relationships in parent and adolescent internalizing symptoms and is the first to our knowledge to have examined parenting self-esteem as a mediator of these relationships. The inclusion of both mothers and fathers is also noteworthy, given that much of the extant research in this and other fields remains biased toward mothers. In addition, the multi-informant assessment of adolescent symptoms provided a more comprehensive test of the hypotheses than did research utilizing single informants.

Beyond replicating and addressing the limitations of the current study, there are many worthwhile avenues for future research. The differential findings for mothers and fathers certainly warrant further investigation. Future research may not only seek to confirm the observed pattern of relationships but may further elucidate mediating and moderating factors, including the role of parenting self-esteem. Also worthy of investigation are individual characteristics of family members such as empathy and resilience, and other internal and external family factors such as family functioning and social networks, which may play important roles in the transmission of internalizing symptoms in the family. Examining depression and anxiety separately may also contribute further understanding to similarities and differences in the antecedents and consequences of these conditions. Notably, the pattern of correlations in the current study indicates that maternal depression and paternal anxiety may be most pertinent to the studied relationships.¹

Understanding and preventing the adverse consequences of parent psychological problems for children and adolescents have been important goals of research, policy, and practice for some time. By comparison, scant attention has been paid to the potentially adverse consequences of child and adolescent psychological problems for parents, particularly in regard to internalizing problems. The current research highlights the need for increased attention to such consequences and for consideration of reciprocal parent-child relationships in both research and clinical settings. Continued research of this kind may ultimately lead to improved theoretical and assessment models that identify key processes that precipitate, maintain, exacerbate, or alleviate symptomatology for both parents and adolescents and in turn provide effective targets for prevention and intervention.

¹ When models were run separately for depressive and anxiety symptoms, fit was typically poor and only the model for mother-adolescent depressive symptoms indicated significant reciprocal relationships.

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