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## Parenting Stress and Youth Symptoms among Girls with and without ADHD

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### SYNOPSIS

**Objective**—To examine the aspects of parenting stress—parental distress [PD] and parental stress due to dysfunctional interactions [PSDI]—reported by mothers of girls with attention-deficit/hyperactivity disorder (ADHD) in both childhood and adolescence and to understand their associations with internalizing and externalizing symptoms in adolescence.

**Design**—The diverse sample comprised 120 girls with ADHD and 81 age- and ethnicity-matched comparison girls, evaluated at ages 6–12 years and followed prospectively for 5 years. Basic demographics, oppositionality, childhood behavioral outcomes and symptoms, and key parenting practice were covaried in the analyses.

**Results**—Longitudinally, PD during the participants' childhood was positively associated with adolescent externalizing and internalizing behaviors, even when statistically controlling for parallel childhood behaviors. PSDI during adolescence was associated with contemporaneous adolescent depressive symptoms and externalizing behaviors, but PD was associated with only internalizing behaviors. With respect to moderation by diagnostic group, PSDI (in childhood) was associated with adolescent internalizing symptoms only in girls with ADHD. However, associations between PD in childhood and internalizing behaviors were stronger in the comparison than the ADHD sample.

**Conclusions**—Minimizing early dysfunctional interactions might reduce internalizing behaviors in girls with ADHD. Interventions targeting parental distress may be beneficial for girls, regardless of ADHD status.

### INTRODUCTION

Youth experience major cognitive, biological, and social shifts during adolescence (Eccles, 1999). Although parental guidance is likely to play an important role in helping adolescents navigate the associated challenges, relevant developmental shifts during this time period—such as an adolescent's growing desire for individuation and autonomy—may alter the parent-child relationship in ways that make such guidance particularly difficult (Burke, Pardini, & Loeber, 2008). This trend is likely to lead to increased tension in the parent-child relationship and may subsequently increase the stress that a parent feels regarding his or her parenting role. Such stress may be magnified when rearing a child with behavioral challenges, such as attention-deficit/hyperactivity disorder (ADHD). Our purpose was to

examine key aspects of maternal parenting stress from childhood to adolescence in a sample of girls with and without ADHD, a diagnostic category that incurs high risk for comorbidity and functional impairment during the transition to adolescence (e.g., Barkley, 2006). We also explored parenting stress in terms of associations (both prospective and concurrent) with key adolescent comorbidities, specifically internalizing and externalizing behavior patterns.

### Parenting Stress in Adolescence

It is theorized that parenting stress is linked to the aversive feelings created when a mismatch exists between perceived demands related to parenting and the resources available to meet those demands (Graziano, McNamara, Geffken, & Reid, 2011). The amount of parenting stress experienced by a parent is likely a function of both the parent's characteristics (e.g., his or her sense of competence) and the child's characteristics (e.g., adaptability; Abidin, 1995).

As children move from middle childhood to adolescence, parents may be prone to increased levels of parenting stress because of the dynamic changes occurring in the parent-child relationship as peers become more influential in the child's life (Pettit, Keiley, Laird, Bates, & Dodge, 2007). For example, parenting a 14-year-old is reported as more stressful than parenting a 10-year-old (Putnick et al., 2010). The affective intensity of parent-child conflict also increases during adolescence, and parents of adolescents are prone to stress associated with dysfunctional interactions in their relationships with their offspring (Laursen, Coy, & Collins, 1998; Putnick, Bornstein, Hendricks, Painter, Suwalsky, & Collins, 2010). Furthermore, personal concerns related to a parent's own midlife transitions (e.g., novel health concerns, biological changes, occupational achievement) often coincide with his or her child's transition to adolescence (Putnick, et al., 2010), fueling additional stress. The mother-daughter dyad may be particularly prone to this relational stress because these dyads tend to report more conflict and higher levels of negative affect than other types of parent-child dyads (e.g., mother-son or father-daughter dyads) in adolescence (Laursen & Collins, 1994). This phenomenon may be related to gender differences in socialization that encourage increased sensitivity to conflict and interpersonal problems in females (Laursen, 1995).

Despite new challenges to parent-child relationships in adolescence, parents continue to serve a protective role with respect to their children's development. Thus, managing parenting stress is important, because such stress has been shown to be a predictor of behavioral problems and externalizing issues in young children and has also been linked to later internalizing symptoms in adolescents (Benzies, Harrison, & Magill-Evans, 2004; Heller, Baker, Henker, & Hinshaw, 1996; Costa, Weems, Pellerin, & Dalton, 2006). Some researchers theorize that parenting stress can increase the risk for dysfunctional parenting practices, which, in turn, lead to increased negative youth tendencies (Morgan, Robinson, & Aldridge, 2002). However, there is also evidence that parenting stress may have a more direct role in the development of adverse outcomes, not subject to mediation by parenting practices (Anthony et al., 2005). Parenting stress might increase a child's risk of developing emotional and behavioral problems by reducing parental responsiveness and increasing a hostile family climate (Anthony et al., 2005). Furthermore, families with high levels of stress

are less likely to discuss and process emotions than other families, and, as result, children in such families have more difficulties with emotional understanding—increasing their risk for later emotional and behavioral problems (Dunn & Brown, 1994).

### Parenting Stress and ADHD

Parents of children with ADHD have greater parenting demands than some other parents—increasing their risk for parenting stress (DuPaul, McGoey, Ecker, & VanBrakle, 2001; Theule, Weiner, Tannock, & Jenkins, 2013). The association between a child's ADHD symptoms and parenting stress may be mediated by the child's difficulty with self-regulation (Grazian et al. 2011). That is, parents of children with ADHD appear particularly prone to parenting stress because they must exert considerable effort to correct their children's behaviors and help with academic work and/or compensate for their children's difficulties with behavioral and emotional self-regulation. These parents also may be more likely to attribute their ADHD children's behavior to malicious intent (e.g., Barkley, Anastopoulos, Guermont, & Fletcher, 1992; Johnston & Ohan, 2005), fueling additional conflict and stress. Thus, parenting stress is part of a bidirectional process by which both parent and child characteristics influence each other and precipitate increasingly negative interactions (Pettit & Ariswalla, 2008).

Furthermore, families of children with ADHD are also prone to dysfunctional parent-child interactions (DuPaul et al., 2001) and to the stress associated with these interactions. Parents of children with ADHD are less warm and engaging than parents of children without ADHD and communicate less effectively than other parents—differences that are mediated by ADHD symptomology (Tripp, Schaughency, Langlands, & Mouat, 2007). As a result, parents may respond to problematic behavior through high levels of verbal reprimands and corrective actions (Modesto-Lowe, Danforth, & Brooks, 2008). Consequently, their children may respond negatively, perpetuating a bidirectional process. Direct observations of mother-adolescent interactions have also revealed that families of adolescents with ADHD—particularly those with comorbid oppositional deficit disorder—have more interaction conflict than families of comparison adolescents (Barkley, Fischer, Edelbrock, & Smallish, 1991).

These dysfunctional interactions and the associated parenting stress are likely to influence broad child outcomes. For example, among boys with ADHD, maternal negativity in mother-son interactions is associated with noncompliance during classroom and playground activities and with objectively measured stealing (Anderson, Hinshaw, & Simmel, 1994). However, among girls with ADHD, few studies have specifically explored dysfunctional mother-daughter interactions and associated child outcomes. We posit that parenting stress associated with such interactions may have deleterious consequences, fueling hostility as well as potential disengagement on both members of the mother-daughter dyad. Furthermore, because females normatively begin to experience increases in internalizing behaviors as they transition to adolescence (Nolen-Hoeksema, & Girgus, 1994), girls may be more likely than their male peers to develop internalizing symptoms in response to the stress experienced by their mothers during this period. Because relevant research has focused primarily on children (rather than adolescents) with ADHD and on boys, the current

investigation should provide insight into the unique challenges related to parenting adolescent girls with ADHD.

## Hypotheses

In this study, we investigated two aspects of parenting stress: parental distress (PD), which refers to the personal stress that a parent has over his or her parenting role; and parental stress due to dysfunctional interactions (PSDI), which refers to the stress fueled by negative interactions in the parent-child relationship. Because of new parenting challenges in adolescence, we predicted that mothers of girls with ADHD and those of comparison girls would report more PD and PSDI during adolescence (Wave 2; follow-up) than in childhood (Wave 1; baseline). Also, given that families of children with ADHD are highly prone to stress and dysfunctional interactions, we predicted that the mothers in these families would report more PD and PSDI than comparison mothers.

As noted above, parenting stress plays a unique role in the development of adverse outcomes, beyond parenting practices per se. Thus, to ascertain whether PD and PSDI predicted youth outcomes independent of parenting practices, we covaried key parenting practices (i.e., parental monitoring, parental involvement, positive parenting, and consistent discipline) that are often associated with problem behavior (Day & Padilla-Walker, 2009; Pettit, Laird, Dodge, Bates, & Criss, 2001; Laub & Sampson, 1988). We expected that both PD and PSDI (measured prospectively in childhood and concurrently in adolescence) would be associated with adolescent outcomes—particularly increased internalizing symptoms—in both groups of girls, even when the girls' childhood levels of the outcomes in question are taken into account for the longitudinal predictions. However, we expected such associations to be stronger in the ADHD group, because parenting stress is likely to be part of a dynamic process through which both parent and child characteristics fuel each other.

## METHOD

The current data were drawn from a longitudinal study of elementary school-aged girls with and without ADHD. Initial data were collected during summer enrichment programs that took place from 1997 to 1999. Each summer, a new cohort of girls with ADHD participated in a 5-week program that offered a combination of classroom, art, drama, and playground activities, along with a group-matched comparison sample of girls without ADHD. This program was designed as an ecologically valid research program rather than a treatment-oriented program. Comparison girls were recruited to be similar in terms of age and ethnicity to the ADHD sample. Parents and teachers completed questionnaires as part of the screening process; girls and their families then went through a thorough assessment battery pertaining to ADHD status as well as comorbidities, impairments, and academic, social, and cognitive functioning. All evaluations were conducted during a period in which girls with prior medication histories were not receiving stimulant medication. See Hinshaw (2002) for additional details. Families were invited to participate in a follow-up study 5 years after their initial participation. Participants completed a thorough evaluation, spanning two half-days at our laboratory/clinic (occasionally, telephone interviews or home visits were performed). Hinshaw, Owens, Sami, and Fargeon (2006) provide full information about the follow-up.

## Participants/Sample

The baseline (Wave 1) sample consisted of 140 girls with ADHD ( $M$  age = 9.7;  $SD$  = 1.72) and 88 comparison girls ( $M$  age = 9.4;  $SD$  = 1.61). The sample was ethnically diverse (53% European American, 27% African American, 11% Latin American, and 9% Asian American). The girls were recruited through a wide range of referral sources. Specifically, the ADHD sample was recruited through medical settings (e.g., health maintenance organizations), mental health centers, pediatric practices, and local school districts. Advertisements were also placed in local newspapers and parenting newsletters. Comparison girls were recruited through school districts and local community centers and through advertisements in the local newspapers and parenting newsletters.

## Procedures

Eligible families were sent packets about the program and then screened for ADHD status. ADHD diagnosis was initially made on the basis of ratings from parents and teachers, with initial screening criteria set somewhat low to avoid prematurely excluding potentially eligible girls. For final eligibility in the ADHD group, the girl had to meet full criteria for ADHD (either Combined or Inattentive subtype) with respect to diagnostic interview criteria (i.e., at least six symptoms of inattention for ADHD-Inattentive or at least six inattention and six hyperactivity-impulsivity symptoms for ADHD-Combined). Girls with the Hyperactive-Impulsive type of ADHD intentionally were not included in the sample, because this type is found mainly in preschoolers and we wanted to preserve statistical power for the two most common presentations among elementary school-aged children (see Lahey, Pelham, Loney, Lee, & Willcutt, 2005). For the comparison group, a diagnosis of ADHD needed to be absent (see Hinshaw, 2002). In a few cases, some elevations on common child psychiatric dimensions were allowed (e.g., anxiety, oppositionality), to avoid a supernormal comparison group.

Of the original 228 families, 209 (92%) participated in the 5-year follow-up study, designated Wave 2 ( $M$  age = 14.2,  $SD$  = 1.68). A comparison of the retained sample with the girls lost to attrition revealed that out of over 50 contrasts, only two significant differences were found: a higher percentage of the girls lost to attrition (53%) were from single-family homes than the follow-up participants (28%), and these girls had higher baseline teacher-reported internalizing scores (Hinshaw et al., 2006).

All parenting measures below were administered at both baseline and follow-up; the primary caregiver served as the informant. In 94% of the cases, this was the child's mother (1% were fathers, 1% were stepmothers, 3% were grandmothers, and 1% were other relatives). To focus on the parenting stress that was specific to mothers, we included only those families in which the parenting stress measure was completed by the mother. Thus, the sample used in the present study comprised 120 girls with ADHD and 81 comparison girls.

## Measures

**PD and PSDI**—These constructs were assessed both in childhood and adolescence via the Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995), a self-report measure assessing the stress parents experience in their parenting role. Mothers rated each item on a 5-point

scale (5 = *strongly disagree*, 1 = *strongly agree*). The subscale tapping PD consists of 12 items (e.g., “*I feel that I cannot handle things.*”) that measure the distress a parent feels in her/his parental role. The Parental-Child Dysfunctional Interaction subscale, which taps PSDI, consists of 12 different items (e.g., “*My child does not like me or want to be close.*”) focusing on stress related to parents’ expectations of their children and their perception of how reinforcing their child is toward them. The items were coded so that higher scores represented higher levels of stress related to dysfunctional interactions. The test-retest reliability and internal consistency of the PSI-SF have been well established, with the reliability of the subscales ranging from .68 to .85 and the internal consistency ranging from .80 to .87 (Abidin & Brunner, 1995). Previous research has also established its validity with respect to other indicators of parenting stress and family dysfunction (Haskett, Ahern, Ward, & Allaire, 2006). In our sample, the internal consistency (Cronbach’s alpha) of the PD scale = .85 at baseline and .87 at follow-up; the correlation between the baseline and follow-up scores was  $r(199) = .59, p < .001$ . Parallel figures for the dysfunctional interaction scale (measuring PSDI) were .88 and .89, and the baseline to follow-up correlation was  $r(199) = .58, p < .001$ .

**Mother-reported externalizing and internalizing behaviors**—Externalizing and internalizing behaviors were measured using the parent-completed Child Behavior Checklist (CBC; Achenbach, 1991). The CBC is a 113-item measure that has well-established internal consistency, test-retest reliability, and validity. Cronbach’s alphas for the broad-band internalizing and the externalizing scales = .92 and .93, respectively, for adolescent girls (1 week test-retest reliabilities = .89 and .93). Mothers rated items assessing their child’s behavior using a 3-point scale (0 = *never happened*; 2 = *happened with great frequency or great intensity*). The raw scores were converted to T-scores using age and gender norms.

**Youth-reported depression**—The girls self-reported depressive symptoms via the short form of the Children’s Depression Inventory (CDI; Kovacs, 1992). This measure is composed of 10 items and used to assess the presence of depressive symptoms including negative mood, interpersonal problems, and negative self-esteem. Presented with three statements (e.g., “*I am sad once in a while.*”, “*I am sad many times.*”, “*I am sad all the time.*”), participants are asked to pick the statement that best described their feelings in the past 2 weeks. Each item was converted to a 0–2 scale, with 0 representing the least severe and 2 representing the most severe statement. Both the test-retest reliability and internal consistency of the CDI have been well established in previous studies: internal consistency = .71–.87 and test–retest reliability averages .70 (Kovacs, 1992).

**Covariates**—Several important background variables, scored at baseline, were included as covariates in the predictive analyses: age, maternal education, and parent-reported family income. Because oppositionality has been found to be associated with both parental distress and externalizing behavior (e.g. Barkley et al., 1991), observed oppositionality was also included as a covariate. In addition, we covaried those parenting practices that were found to be associated with the behavioral outcomes in our study. We assessed these different aspects of parenting practices (i.e., parental monitoring, parental involvement, positive parenting, and consistent discipline) using the Alabama Parenting Questionnaire (APQ; Shelton, Frick



& Wootton, 1996), an empirically established parent self-report measure consisting of 35 questions. Mothers rated each item on a 5-point scale (1 = *never*, 5 = *always*). The poor monitoring/supervision subscale of the APQ includes 10 items measuring parents' tracking of their children's whereabouts (e.g., "*Your child goes out without a set time to be home.*"). The positive parenting subscale includes 6 items measuring parents' use of praise and reward (e.g., "*You let your child know when he/she is doing a good job with something.*"). The parental involvement subscale includes 10 items measuring positive activities between parents and children (e.g., "*You ask your child about his/her school day.*"). The inconsistent discipline subscale includes 6 items measuring how often parents follow through with disciplinary actions (e.g., "*You threatened to punish your child and then do not actually punish him/her.*"). Items for the poor monitoring and inconsistent discipline were reverse scored. In a previous study of children aged 6–13 years from both community settings and clinical settings, the internal consistency of each subscale ranged from .67 to .80 (Shelton et al., 1996).

### Statistical Analyses

Statistical analyses were performed using SPSS Version 22. T-tests were conducted to assess diagnostic group differences with respect to covariates, putative predictor variables, and adolescent criterion measures. Preliminary hierarchical multiple regression analyses were conducted to identify those parenting practices associated with youth-reported depressive symptoms and mother-reported internalizing behaviors and externalizing behaviors, measured in adolescence. At Step 1, the girls' diagnostic status was dummy coded (i.e., those with ADHD were coded as 1 and the comparison group was coded as 0) and entered along with maternal age, education, and family income. To account for any variance related to girls' oppositional behaviors, we also included the level of oppositionality observed in the girls at the summer programs, via reliable observations of classroom and play yard interactions (see Hinshaw, 2002). The goal was to include a measure of oppositional behavior from a source other than parent informants. Those parenting practices that were found to be significant predictors of the key outcomes were used as covariates in subsequent regression models examining which aspects of parenting stress were associated with the outcomes.

In our main analysis, separate hierarchical regressions were conducted for parenting stress factors reported at baseline (predictive) versus follow-up (concurrent), for a total of six hierarchical regressions. All continuous predictor variables were centered. At Step 1, the girls' diagnostic status, maternal age, education, family income, and observed oppositionality were entered. To ensure that our analysis assessed the increase in adolescent symptoms from childhood, we also entered the girls' baseline depressive and internalizing/externalizing symptoms for each corresponding outcome variable (e.g., baseline depressive symptoms for the model exploring adolescent depressive symptoms as an outcome). At Step 2, we entered the significant parenting practices from our preliminary analyses that were significant predictors of each outcome variable. At Step 3, the two parenting stress factors (PD and PSDI) were entered. At Step 4, we entered two-way interactions between the parenting factors and the girls' ADHD status.



In the presence of any significant two-way interactions, we followed Holmbeck's (2002) procedure for probing a moderational effect involving a dichotomous and a continuous variable. Thus, we (1) created conditional moderators (by manipulating the 0-point of our dichotomous ADHD status variable) and (2) conducted separate regression analyses to test the significance of the simple slope of the predictor variable on the outcome variable separately for ADHD versus comparison girls.

## RESULTS

Tables 1 and 2 present scores for the ADHD and comparison samples with respect to demographic, parenting, and behavioral variables. Tables 3 and 4 present the intercorrelations between the parenting and behavioral variables from each wave. The groups were statistically indistinguishable with respect to maternal age, education, and family income. However, a chi-square test revealed a significant difference in the ethnic composition of the groups,  $\chi^2(4), N = 201 = 9.30, p < .05$ , with a higher percentage of Asian American girls in the comparison group. Furthermore, girls with ADHD had far worse scores on all behavioral outcomes and on the PD and PSDI constructs at both waves.

### Preliminary Analysis of Parenting Practices

**Internalizing Symptoms**—Baseline (childhood) parental involvement significantly predicted adolescent girls' internalizing symptoms, with higher levels associated with lower levels of internalizing symptoms ( $\beta = -.19, p < .05$ ). Baseline parental monitoring ( $\beta = -.07, ns$ ), positive parenting ( $\beta = .01, ns$ ), and consistent discipline ( $\beta = -.01, ns$ ) did not predict adolescent girls' internalizing symptoms. None of the concurrent parenting practices was associated with adolescent girls' internalizing symptoms.

**Externalizing Symptoms**—Baseline parental involvement significantly predicted adolescent girls' externalizing symptoms, with higher levels associated with lower levels of externalizing symptoms ( $\beta = -.17, p < .05$ ). Baseline parental monitoring ( $\beta = -.11, ns$ ), positive parenting ( $\beta = -.03, ns$ ), and consistent discipline ( $\beta = -.04, ns$ ) did not predict adolescent girls' externalizing symptoms. Both parental involvement ( $\beta = -.30, p < .001$ ) and consistent discipline ( $\beta = -.17, p < .01$ ) during adolescence were associated with concurrent externalizing symptoms, with higher levels of involvement and consistent discipline associated with lower levels of externalizing symptoms. Neither parental monitoring nor positive parenting during adolescence was associated with concurrent externalizing symptoms.

**Depressive Symptoms**—None of the baseline parenting practices significantly predicted adolescent girls' depressive symptoms.

### Temporal and Group Differences in the Parenting Stress

Two 2 (time: baseline, follow-up)  $\times$  2 (diagnostic status: ADHD, comparison) mixed ANOVAs were conducted to assess mean-level differences in PD and PSDI. For PD, a main effect for time emerged  $F(1, 190) = 11.73, p < .001, \eta^2 = .06$ : counter to expectations, mothers reported lower levels of PD at follow-up ( $M = 2.10, SD = .73$ ) than at baseline ( $M =$

2.26,  $SD = .66$ ). Significant effects were found for ADHD status,  $F(1, 190) = 16.17, p < .001, \eta^2 = .08$ : the mothers of girls with ADHD reported more PD ( $M = 2.32, SD = .60$ ) than comparisons ( $M = 1.97, SD = .60$ ). No significant effects were found for the Time  $\times$  ADHD status interaction,  $F(1, 190) = .01, ns, \eta^2 = .00$ .

For PSDI, no effects for time,  $F(1, 190) = .24, ns, \eta^2 = .00$ , and the Time  $\times$  ADHD status interaction,  $F(1, 190) = 1.99, ns, \eta^2 = .01$  were found. However, significant effects emerged for ADHD status,  $F(1, 190) = 49.02, p < .001, \eta^2 = .21$ , such that mothers of girls with ADHD reported more PSDI ( $M = 2.30, SD = .62$ ) than mothers of comparison girls ( $M = 1.66, SD = .62$ ).

### Predictions from Childhood (Baseline) Parenting Factors to Adolescent Girls' Outcomes

See Table 5 for key findings.

**Self-reported depression**—At Step 1, oppositionality and age were significant predictors, such that, from childhood (baseline) to adolescence, girls with higher levels of oppositionality in childhood reported increases in depressive symptoms ( $\beta = .18, p < .05$ ), and older girls reported increases in depressive symptoms compared to younger girls ( $\beta = .20, p < .01$ ). Baseline depressive symptoms were also associated with adolescent depressive symptoms ( $\beta = .17, p < .05$ ). At Step 2, PD and PSDI failed to significantly predict adolescent depression, and no interactions attained significance.

**Internalizing behavior**—At Step 1, ADHD status was a significant predictor, such that girls with ADHD had higher scores in adolescence ( $\beta = .16, p < .05$ ). Baseline internalizing symptoms were also associated with adolescent girls' internalizing symptoms ( $\beta = .46, p < .001$ ). At Step 2, baseline parental involvement significantly predicted adolescent girls' internalizing symptoms, with lower levels associated with increased internalizing symptoms in adolescence ( $\beta = -.16, p < .01$ ). At Step 3, PSDI during childhood failed to predict adolescent girls' internalizing symptoms, but baseline PD was associated with adolescent girls' internalizing symptoms ( $\beta = .16, p < .05$ ). At Step 4, the two-way interaction between ADHD status and PSDI was significant. Post-hoc analyses revealed that high levels of PSDI were linked with increased internalizing symptoms for girls with ADHD ( $\beta = .26, p < .001$ ) in adolescence but not for comparisons ( $\beta = .09, ns$ ). See Figure 1. The two-way interaction between ADHD status and PD failed to attain significance.

**Externalizing behavior**—At Step 1, both ADHD status and age were significant predictors: The clinical sample had greater increases in adolescent externalizing symptoms than comparisons ( $\beta = .15, p < .05$ ), and older girls reported greater increases of adolescent externalizing symptoms than younger girls ( $\beta = .11, p < .05$ ). Baseline externalizing symptoms were also associated with adolescent girls' externalizing symptoms ( $\beta = .52, p < .001$ ). At Step 2, parental involvement predicted adolescent girls' externalizing symptoms ( $\beta = -.13, p < .05$ ), such that lower involvement was linked prospectively with higher rates of externalizing problems. PD also contributed significant variance, revealing a positive association with adolescent girls' externalizing symptoms ( $\beta = .17, p < .01$ ). However, PSDI

did not contribute to variance in adolescent girls' externalizing symptoms, and no significant two-way interactions between ADHD status and any predictor emerged.

### Concurrent Associations between Adolescent (Follow-up) Parenting Factors

See Table 6 for key findings.

**Self-reported depression**—At Step 1, oppositionality was significantly associated with adolescent depressive symptoms ( $\beta = .19, p < .01$ ). Age was significant, such that older girls reported more depressive symptoms ( $\beta = .21, p < .05$ ). Baseline depressive symptoms were also associated with adolescent depressive symptoms ( $\beta = .15, p < .01$ ). Step 2, PSDI during adolescence was significantly associated with depressive symptoms, such that high levels of PSDI were associated with increased depressive symptoms ( $\beta = .20, p < .01$ ). At Step 4, none of the two-way interactions was significant.

**Internalizing symptoms**—As with the predictive associations, ADHD ( $\beta = .16, p < .05$ ) and baseline internalizing symptoms ( $\beta = .46, p < .001$ ) were significantly associated with adolescent internalizing symptoms at Step 1. Income ( $\beta = -.08, p < .05$ ) was also significant, such that higher income was associated with fewer internalizing symptoms. Follow-up PD ( $\beta = .19, p < .05$ ) was significant, but PSDI ( $\beta = .14, p < .05$ ) was not. At Step 3, a two-way interaction between ADHD status and PD was found. High levels of PD reported at follow-up were associated with greater internalizing symptoms in both groups, but this relation was stronger for those in the comparison group ( $\beta = .60, p < .01$ ) than in the group with ADHD ( $\beta = .25, p < .001$ ). See Figure 2.

**Externalizing symptoms**—As with the predictive associations, ADHD ( $\beta = .17, p < .05$ ), age ( $\beta = .11, p < .05$ ), and baseline symptoms ( $\beta = .50, p < .001$ ) were significantly associated with adolescent externalizing symptoms at Step 1. Oppositionality ( $\beta = .13, p < .05$ ) was also significant, such that girls with higher levels of oppositionality in adolescence showed higher numbers of current externalizing symptoms. At Step 2, higher levels of parental involvement ( $\beta = -.22, p < .001$ ) and consistent discipline ( $\beta = -.12, p < .01$ ) during adolescence were associated with decreased externalizing symptoms. At Step 3, PSDI was positively associated with adolescent girls' externalizing symptoms ( $\beta = .22, p < .01$ ). PD did not contribute to the variance in adolescent girls' externalizing symptoms. There were no two-way interactions between ADHD status and any of the parenting stress predictors.

## DISCUSSION

Overall, the mothers of girls with ADHD reported more PSDI and PD than the comparison mothers, consistent with research suggesting that the amount of stress experienced by a parent is likely to be a function of both parent and child attributes (Abidin, 1995). However, there were also unexpected declines in PD in both groups by adolescence—which may be due to parents' becoming more settled in their parental role as their children enter adolescence (Putnick et al., 2010). Furthermore, there were no significant diagnostic group differences in the longitudinal trends related to either parenting stress construct. Thus, although the mothers of girls with ADHD experienced more parenting stress than comparison mothers throughout both childhood and adolescence, both kinds of mothers

experienced the same relative changes in parenting stress during their daughters' transition to adolescence. More research should be done to explore whether mothers of girls with ADHD experience changes in aspects of parenting or in perceptions of life stress that diverge from those of comparison mothers—perhaps in other developmental transitions, as well.

In terms of predictive associations, maternal PD reported during the girls' childhood was significantly related to mother-reported adolescent internalizing *and* externalizing behaviors. PD during adolescence was concurrently associated with increases (from baseline) in contemporaneous mother-reported internalizing behaviors, whereas PSDI was concurrently associated with increases in youth-reported depressive symptoms and mother-reported externalizing symptoms. This pattern supports previous research suggesting that both parenting stress and dysfunctional interactions in the parent-child relationship have broad implications for adolescent behavioral outcomes (e.g., Anderson et al., 1994; Benzie et al., 2004; Heller et al., 1996). These associations were observed even when accounting for other significant parenting behaviors, supporting the notion that parenting stress has an at least partially independent role from parenting practices per se. Parenting stress may increase children's risk for adverse outcomes by reducing parental responsiveness and hampering children's emotional understanding (see Anthony et al., 2005). Further research should explore additional mechanisms behind the associations between parental stress and adolescent outcomes.

Some differences were found when the girls with ADHD were compared to those without ADHD. In particular, PSDI in childhood was associated with mother-reported adolescent internalizing behaviors for girls with ADHD but not for the comparison group. This finding was especially true when the mothers of girls with ADHD experienced early PSDI, supporting the notion that both parent (i.e., parenting stress) and child characteristics (i.e., ADHD status) are involved in a dynamic and reciprocal process (e.g., Pettit & Ariswalla, 2008). Because children with ADHD may be at increased risk for the development of depression in adolescence (Chronis-Tuscano et al., 2010), the link between early PSDI and later internalizing behaviors for girls with ADHD suggests that early interventions aimed at reducing dysfunctional interactions might mitigate such risk, although causal status cannot be completely asserted here.

In contrast, the relation between PD at adolescence and concurrent internalizing behaviors was stronger for those girls *without* ADHD, even though a significant association was present in the ADHD group as well. Previous research suggests that children with ADHD are particularly prone to the effects of less-than-optimal parenting styles (see Johnston & Mash, 2001). Our results suggest that this vulnerability can vary depending on the aspect of parenting explored and may not generalize to parental distress. As noted earlier, parental distress focuses on the aspect of parenting stress that is associated with parents' perception of their parenting role, whereas PSDI focuses on parents' perceptions of their parent-child interactions. Because of the dynamic nature of parent-child interactions, dysfunction and stress within these interactions may have a more direct role on outcomes in children with ADHD (given their behavioral tendencies), making PSDI more salient than PD in these families. Further research could explore possible mechanisms that explain why PSDI

appears to be more influential in families of girls with ADHD and PD appears to be more influential in families of girls without ADHD.

There were some limitations in our study that should be noted. Because research examining parenting and symptomatic outcomes in female adolescents has been quite limited, we focused on adolescent girls. Given the lack of a male sample, however, we were not able to directly explore gender differences. Few studies have focused on differences in parenting experienced by boys and girls with ADHD and how these may contribute to adolescent developmental outcomes. The relation we uncovered between PSDI and mother-reported internalizing behaviors may not pertain to boys with ADHD, because girls seem particularly prone to increases in internalizing behaviors during the transition to adolescence (e.g., Nolen-Hoeksema & Girgus, 1994). Thus, this aspect of parenting stress may be linked more specifically to adolescent externalizing behaviors in boys with ADHD.

Mothers' reports were used to both assess the girls' adolescent externalizing and internalizing symptoms and to assess parenting stress. In addition, fewer associations were found when adolescent-reported depression was examined as an outcome. Thus, our investigation may be subject to shared method variance. We also only used one measure to assess each construct. Future investigations could include more objective measures and additional indicators of externalizing symptoms, internalizing symptoms, and parenting stress.

In addition, we did not include paternal reports of stress and monitoring, which may be associated with key adolescent outcomes in girls. Adding girls' own accounts of their experience of their parents' stress and dysfunctional interactions may also be beneficial in further understanding how parenting stress and family dysfunction lead to adverse outcomes. Furthermore, because parenting is likely to be involved in a bidirectional process by which both parental and child behaviors influence each other, future research should also explore how early child characteristics and other parent characteristics (e.g., the parent's own ADHD status and depressive symptomology) influence parenting and associated stress. An investigation of early parenting behaviors could also provide more insight into how the dysfunction in the mother-daughter dyad originates and develops over time. Finally, our study only included girls with Combined and Inattentive subtypes, which are by far the two most common types found in elementary school children, and cannot be generalized to girls with the Hyperactive-Impulsive subtype. Despite these limitations, our study has several strengths—in particular, a low participant attrition rate and an ethnically diverse sample—which contribute to the overall validity of our results.

Given these results, baseline parental involvement was included as a covariate in analyses exploring baseline PD and PSDI as predictors of adolescent girls' internalizing behavior and externalizing behavior. In addition, parental involvement and consistent discipline reported during follow-up were included as covariates in the analyses examining follow-up PD and PSDI as concurrent predictors of adolescent girls' externalizing behavior.

## IMPLICATIONS FOR PRACTICE, APPLICATION, THEORY, AND POLICY

Our results suggest that early parental distress and early dysfunction in the mother-daughter relationship are associated with girls' risk of developing later internalizing and externalizing behaviors. Even though we cannot assert causality, interventions targeting parental distress may be beneficial for girls, regardless of ADHD diagnosis. Early dysfunction in the mother-daughter relationship also seems to particularly increase the risk for girls with ADHD. Thus, mothers of girls with ADHD should be encouraged to seek the resources and support needed to reduce dysfunction (and associated stress) in their relationship. As previous research has shown that girls experience dramatic increases in internalizing behaviors in adolescence, the associations found between internalizing behavior and parenting stress may be unique to adolescent girls.

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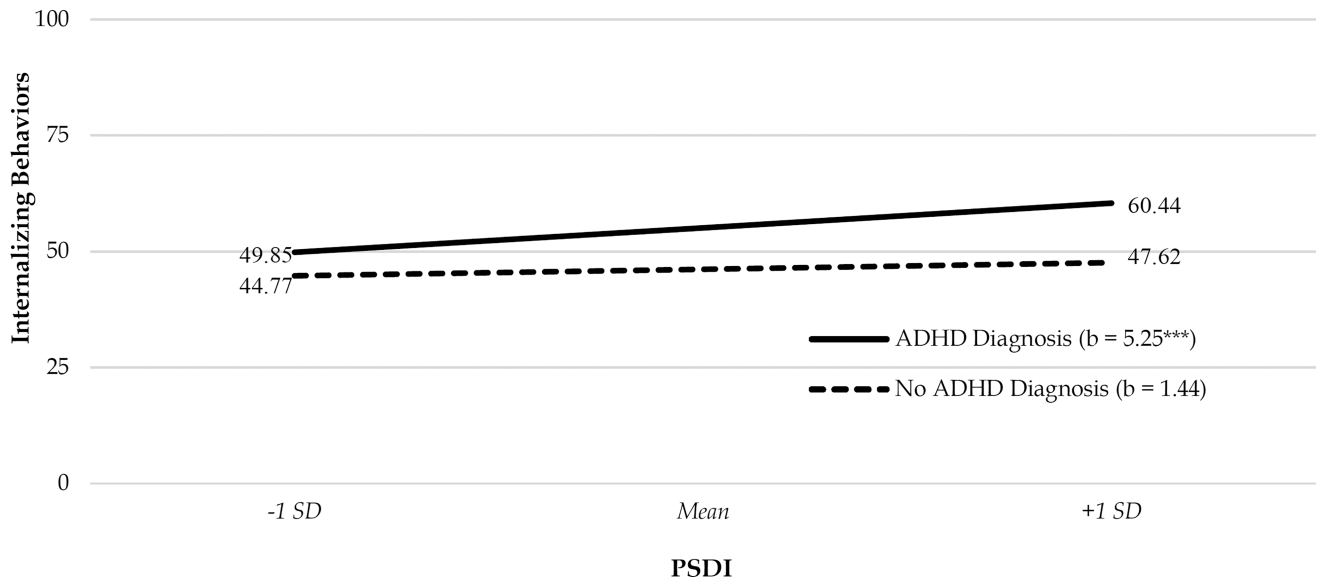
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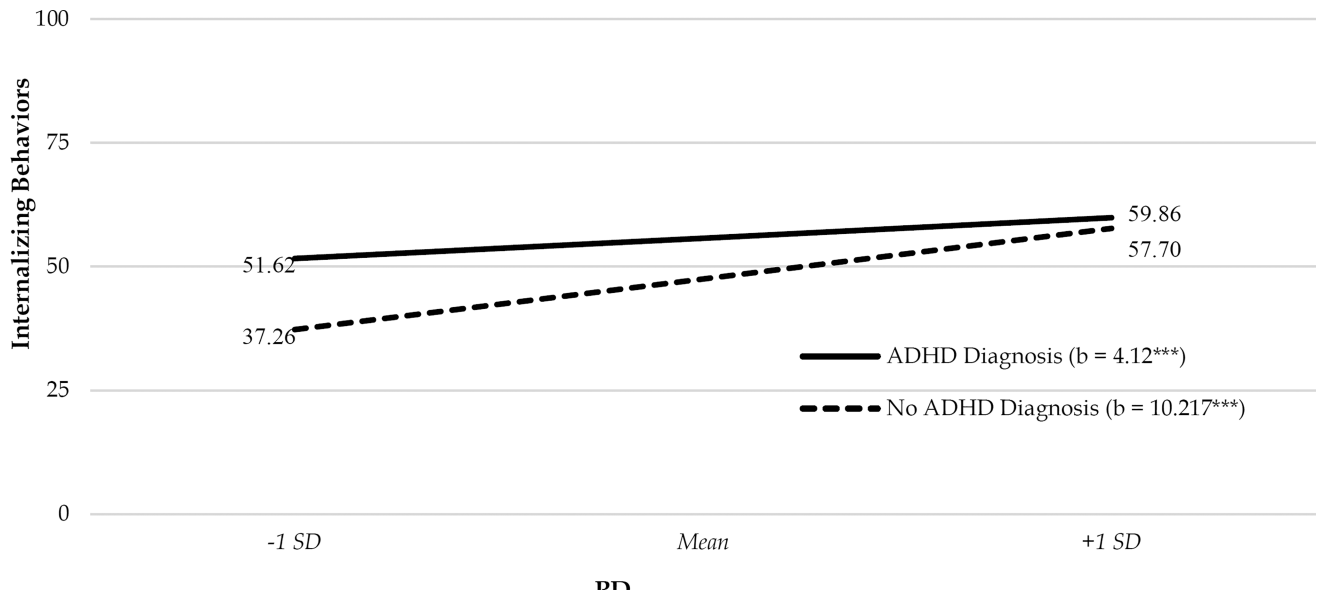
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**Figure 1.**  
Time 2 Internalizing Behaviors as a Function of Time 1 Parental Stress Due Dysfunctional Interactions (PSDI)  
\* $p < .05$ . \*\* $p < .01$ . \*\*\*  $p < .001$ .



**Figure 2.**  
Time 2 Internalizing Behaviors as a Function of Time 2 Parental Distress (PD)  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

TABLE 1

## Demographic Variables

	ADHD <sup>a</sup>		Comparison <sup>b</sup>		T-test <i>t</i> ( <i>df</i> )	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Demographic Variables						
Age (months)	115.95	20.66	111.84	19.31	1.42 (199)	.21
Ethnicity (%)						
European American	60.8		46.9			
African American	22.5		27.2			
Latin American	11.7		11.1			
Asian American <sup>c</sup>	4.2		14.8			
Total Annual Family Income <sup>d</sup>	6.47	2.59	6.81	2.37	-.94 (197)	-.14
<\$10,000 (%)	2.5		5.8			
\$10,001 to \$20,000	3.7		2.5			
\$20,001 to \$30,000	6.2		7.6			
\$30,001 to \$40,000	7.4		6.8			
\$40,001 to \$50,000	7.4		14.4			
\$50,001 to \$60,000	12.3		7.6			
\$60,001 to \$70,000	12.3		11			
\$70,001 to \$75,000	7.4		6.8			
>\$75,000	40.7		36.4			
Maternal Education <sup>e</sup>	4.76	.88	4.98	.95	-1.66 (199)	-.24
Less than 8 <sup>th</sup> grade (%)	0.0		0.0			
Some high school	1.2		0.0			
High school graduate	2.5		4.2			
Some College	30.9		40.8			
College graduate	28.4		30.0			
Advanced or prof. degree	37.0		25.0			

<sup>a</sup>For Wave 1, *n*=120 For Wave 2, *n*=119<sup>b</sup>For Wave 1, *n*=81. For Wave 2, *n*=81

c<sub>1</sub> There was a significantly higher percentage of Asian American girls in the comparison group:  $\chi^2(4), N=201) = 9.298, p < .05$

d<sub>1</sub> For total annual family income, 1 < \$10,000; 9 > \$75,000.

e<sub>1</sub> For maternal education, 1 = less than 8th grade; 6 = advanced or professional degree

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TABLE 2

Wave 1 and Wave 2 Variables

	ADHD <sup>a</sup>		Comparison <sup>b</sup>		T-test <i>t</i> ( <i>df</i> )	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Parenting Practice Variables						
Wave 1 Monitoring	4.49	.40	4.53	.35	-.80 (194)	-.10
Wave 1 Parental Involvement	3.84	.46	3.95	.52	-1.60 (194)	-.22
Wave 1 Positive Parenting	4.21	.53	4.10	.52	1.31 (194)	.21
Wave 1 Consistent Discipline	3.58	.55	3.74	.53	-1.99 (194)*	-.30
Wave 2 Monitoring	4.17	.48	4.15	.46	.27 (194)	.04
Wave 2 Parental Involvement	3.80	.52	3.77	.57	.29 (194)	.05
Wave 2 Positive Parenting	4.03	.62	3.98	.59	.55 (194)	.08
Wave 2 Consistent Discipline	3.76	.61	3.93	.62	-1.90 (194)	-.28
Parenting Stress Variables						
Wave 1 PD	2.43	.73	2.06	.53	4.12 (196)**	.58
Wave 1 PSDI	2.36	.73	1.63	.61	7.62 (188)**	1.09
Wave 2 PD	2.24	.80	1.88	.55	3.69 (192)**	.52
Wave 2 PSDI	2.25	.79	1.68	.67	5.35 (183)**	.78
Outcome Variables						
Youth-reported CDI	7.53	5.87	5.01	5.28	3.10 (198)**	.40
Mom CBC Internalizing	56.60	10.81	45.57	10.94	6.92 (194)**	1.01
Mom CBC Externalizing	61.67	10.87	45.80	9.92	10.38 (194)**	1.53

Notes: CDI = Child Depression Index; CBC = Child Behavior Checklist; PD = Parental Distress; PSDI = Parental Stress due to Dysfunctional Parent-Child Interactions

<sup>a</sup>For Wave 1, *n*=120 For Wave 2, *n*=119

<sup>b</sup>For Wave 1, *n*=81. For Wave 2, *n*=81

\* *p* < .05.

\*\* *p* < .01.

**TABLE 3**

Correlations for Predictors and Outcomes

Measures	1	2	3	4	5	6	7
1. W1 Monitoring	-						
2. W1 Parental Involvement	.23**	-					
3. W1 Positive Parenting	.15*	.60**	-				
4. W1 Cons. Discipline	.25**	.20**	.14	-			
5. W1 PD	-.25**	-.38**	-.29**	-.31**	-		
6. W1 PSDI	-.27**	-.35**	-.30**	-.29**	.55**	-	
7. W2 Monitoring	.43**	.25**	.27**	.11	-.13	-.16*	-
8. W2 Parental Involvement	.20**	.59**	.57**	.17*	-.31**	-.25*	.44**
9. W2 Positive Parenting	.14	.48**	.71**	.19*	-.24**	-.28**	.40**
10. W2 Cons. Discipline	.16*	.10	.00	.58**	-.19*	-.22**	.16*
11. W2 PD	-.22**	-.31**	-.20**	-.26**	.59**	.43**	-.17*
12. W2 PSDI	-.27**	-.36**	-.23**	-.25**	.47**	.58**	-.21**
13. Observed Opposition	.05	-.08	.02	.01	.12	.25**	.08
14. Mom CBC Externalizing	-.18*	-.24**	-.08	-.12	.39**	.41**	-.11
15. Mom CBC Internalizing	-.20**	-.25**	-.05	-.18*	.41**	.43**	-.14
16. Youth-reported CDI	-.07	-.12	-.09	-.04	.16*	.22**	-.19**

\*  $p < .05$ .

\*\*  $p < .01$ .



**TABLE 4**

Correlations for Predictors and Outcomes (Continued)

Measures	8	9	10	11	12	13	14	15
1. W1 Monitoring								
2. W1 Parental Involvement								
3. W1 Positive Parenting								
4. W1 Cons. Discipline								
5. W1 PD								
6. W1 PSDI								
7. W2 Monitoring								
8. W2 Parental Involvement								
9. W2 Positive Parenting	.67**	-						
10. W2 Cons. Discipline	.11	.06	-					
11. W2 PD	-.31**	-.23**	-.30**	-				
12. W2 PSDI	-.36**	-.24**	-.32**	.69**	-			
13. Observed Opposition	.08	.04	-.06	.21**	.26**	-		
14. Mom CBC Externalizing	-.14*	-.05	-.13	.43**	.46**	.29**	-	
15. Mom CBC Internalizing	-.25**	-.10	-.28**	.46**	.58**	.47**	.65**	-
16. Youth-reported CDI	-.17*	-.16*	-.07	.13	.27**	.24**	.33**	.31**

\*  $p < .05$ .

\*\*  $p < .01$ .

**TABLE 5**

Wave 1 Parenting Factors Predicting Outcome Variables

	Youth Reported Depressive Symptoms		Mother Reported Internalizing Symptoms		Externalizing Symptoms	
	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$
Step 1	.14***		.37***		.53***	
ADHD Status		.06		.16*		.15*
Age (months)		.20***		.02		.11*
Family Income		.03		-.08		-.08
Maternal Education		-.02		.06		.00
Observed Oppositionality		.18*		.09		.12
Baseline Symptoms <sup>b</sup>		.17*		.46***		.52***
Step 2	--		.02**		.02*	
Wave 1 Parental Involvement <sup>d</sup>		--		-.16**		-.13*
Step 3	.01		.02		.02*	
Wave 1 PD		.06		.16*		.17**
Wave 1 PSDI		.05		.01		-.05
Step 4	.01		.02		.01	
Wave 1 PD × ADHD		-.26		-.20		-.18
Wave 1 PSDI × ADHD		.12		.26*		-.01
Adj. R <sup>2</sup> for Total Model	.12		.39		.55	

Note.

<sup>a</sup>Wave 1 Parental Involvement did not significantly predict Wave 2 Depressive Symptoms. Thus, it was not included as a covariate for this criterion.

<sup>b</sup>Baseline depressive, internalizing, and externalizing symptoms were entered as covariates for each corresponding outcome variable. (e.g. baseline depressive symptoms were entered as a covariate for model exploring adolescent depressive symptoms as an outcome).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**TABLE 6**

Wave 2 Parenting Factors Associated with Outcome Variables

	Youth Reported Depressive Symptoms		Mother Reported Internalizing Symptoms		Externalizing Symptoms	
	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$
Step 1	.14***		.37***		.53***	
ADHD Status		.07		.16*		.17*
Age (months)		.21***		.03		.11*
Family Income		.04		-.08*		-.08
Maternal Education		-.01		.07		.01
Oppositionality		.19***		.09		.13*
Baseline Symptoms <sup>b</sup>		.15*		.46***		.50***
Step 2	--		--		.07***	
Wave 2 Parental Involvement <sup>a</sup>		--		--		-.22***
Wave 2 Consistent Discipline <sup>a</sup>		--		--		-.12*
Step 3	.02		.08***		.04***	
Wave 2 PD		-.08		.19*		.04
Wave 2 PSDI		.20*		.14		.22**
Step 4	.01		.03**		.01	
Wave 2 PD × ADHD		-.10		-.47**		-.23
Wave 2 PSDI × ADHD		-.15		.21		.12
Adj. R <sup>2</sup> for Total Model	.13		.45		.62	

Note.

<sup>a</sup>Wave 2 Parental Involvement and Wave 2 Consistent Discipline did not significantly predict Wave 2 Depressive Symptoms and Internalizing Symptoms. Thus, they were not included as covariates for these criterion.

<sup>b</sup>Baseline depressive, internalizing, and externalizing symptoms were entered as covariates for each corresponding outcome variable. (e.g. baseline depressive symptoms were entered as a covariate for model exploring adolescent depressive symptoms as an outcome).

\*  $p < .05$ .

.100 > .  
\*\*\*  
*p* < .001  
\*\*\*  
'10' < .  
\*\*

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