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Implications of Early-Onset Psychiatric Symptoms for Peer Functioning in Middle-Childhood: A Validity and Clinical Significance Approach

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Abstract of the Dissertation

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Recent findings indicate that preschoolers experience psychiatric symptoms at rates similar to that of older children and adolescents. However, there are limited data examining the impact of early-onset psychiatric symptoms on subsequent peer functioning. To support the validity and clinical significance of early-emerging symptoms, it is necessary to demonstrate that youth with elevated symptom levels experience significant later difficulties across various domains. Most research linking these constructs has examined the impact of externalizing symptoms on peer functioning cross-sectionally, without consideration of internalizing symptoms. The goals of this study were to derive multiple-informant middle-childhood peer factors, examine the longitudinal impact of internalizing (depression, anxiety) and externalizing (oppositional defiant disorder [ODD], attention deficit/hyperactivity disorder [ADHD]) symptoms at ages 3 and 6 on peer functioning in middle-childhood, and explore mediating and moderating mechanisms between these relationships. The sample was comprised of 427 children, who were roughly half-male (53.2%) and primarily Caucasian (87.6%). Early-onset psychopathology was assessed via the Preschool Age Psychiatric Assessment at ages 3 and 6, and parents, children, and teachers reported on peer functioning at age 9. Results indicated that preschool depressive, anxiety, and ODD symptoms predicted difficulty with peer acceptance and aggression in middle-childhood, above and beyond concurrent symptoms. There were stronger links between symptoms at school entry and peer functioning in middle-childhood, with depression, anxiety, ODD, and ADHD all impacting social discomfort, low acceptance, and aggression with peers. We further found that socially unskilled behavior mediated the relationship between preschool externalizing symptoms and later peer difficulty, and that children with psychiatric symptoms at school-entry consistently evidenced increased peer difficulty in middle-childhood relative to those with low symptoms at school-entry. Finally, we found that children who had elevated preschool depression scores *and* a parent with poor psychiatric functioning and/or marital dissatisfaction were significantly more

prone to low acceptance among peers, elevated aggression levels, and greater exclusion by peers. Our findings underscored the importance of early-onset depressive symptoms, given the numerous unique associations between preschool-onset depression and subsequent peer functioning difficulty. This study supported early identification of psychiatric symptoms in young children, which can lead to intervention for at-risk children.

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Acknowledgments

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Introduction

It is well-documented that associations exist between difficulties with peer relationships and poor psychological adjustment (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). Youth engaged in problematic peer relationships experience increased loneliness, problem behavior, and academic difficulty (Deater-Deckard, 2001; Parker et al., 2006) and are at risk for a host of future negative outcomes, including school drop-out, criminality, psychopathology, and reduced overall life satisfaction (Bagwell, Newcomb, & Bukowski, 1998; Parker & Asher, 1987). On the other hand, the adolescent literature also indicates that psychiatric symptoms have detrimental effects on later interpersonal functioning (e.g., Chen, Cohen, Johnson, & Kasen, 2009). Thus, data support that the relationship between peer functioning problems and psychological adjustment is bidirectional, with children who experience peer difficulties being more likely to develop later psychopathology (Deater-Deckard, 2001; Hymel, Rubin, Rowden, & LeMare, 1990; Parker & Asher, 1987; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Wichstrøm, Belsky, & Berg□Nielsen, 2013), *and* youth with early symptoms of psychopathology being at greater risk of experiencing subsequent difficulty in interpersonal relationships (Chen et al., 2009; Cuevas, Finkelhor, Ormrod, & Turner, 2009; Reijntjes et al., 2010). However, most of the research in young children has focused on the impact of poor peer relationships on later adjustment difficulty and psychopathology (e.g., Ladd & Troop-Gordon, 2003; Ladd, 2006; McDougall, Hymel, Vaillancourt, & Mercer, 2001), although there has been a more recent interest in examining the reverse association in this age set due to the growing interest in psychopathology in preschoolers and early-elementary aged children.

Early-Onset Psychopathology

Historically, very young children were considered incapable of experiencing significant psychiatric symptoms. We now know that this is not the case, as valid and reliable assessment tools for assessing preschool and school-entry psychopathology have emerged over the past decade and suggested otherwise. Indeed, a significant proportion of preschool-aged children experience psychopathology (Angold & Egger, 2007; Bufferd, Dougherty, Carlson, & Klein, 2011; Ezpeleta, de la Osa, & Doménech, 2014) in patterns similar to those seen in early-elementary aged children (Carter et al., 2010), older children (Ford, Goodman, & Meltzer, 2003) and adults (Wichstrøm & Berg-Nielsen, 2013). Importantly, observed forms of psychopathology in the preschool and early-elementary school age groups are not limited to traditional early childhood disorders (e.g., elimination, feeding disorders) but also include a range of both internalizing (e.g., anxiety, depression) and externalizing (e.g., attention-deficit/hyperactivity disorder [ADHD], oppositional defiant disorder [ODD]) conditions.

The literature on early childhood and school-age disorders has traditionally emphasized behavior-based (e.g., elimination, feeding disorders, ADHD, and ODD) as opposed to emotion-based (e.g., depression, anxiety) difficulties. This is in large part because behaviors associated with externalizing disorders (e.g., hyperactivity, temper tantrums, defiance) are more readily identified by adults, relative to behaviors of internalizing disorders (e.g., sadness, withdrawal, avoidance). Partly as a result, it is often assumed that externalizing disorders are more prevalent than internalizing conditions in very young children (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009), although this may not be accurate. In fact, data from a recent study supports that anxiety may be more highly prevalent than some externalizing conditions in preschool-aged children (Bufferd et al., 2011). With findings like this, researchers have been placing a greater emphasis on the role of internalizing symptoms in the mental health of young children as of late

(e.g., Klitzing et al., 2014; Carter et al., 2010), and data support that internalizing symptoms have significant effects on general child and family functioning from a young age (Benjamin, Costello, & Warren, 1990; Bufferd et al., 2011; Fuhrmann, Equit, Schmidt, & von Gontard, 2014; Luby, Belden, Pautsch, Si, & Spitznagel, 2009; Luby, Heffelfinger, Mrakotsky, Hessler, & Hildebrand, 2002). For example, one recent study found that parents of preschool children who have anxiety disorders report a significant negative impact on family functioning and quality of life measures at rates similar to that of externalizing preschoolers (Towe-Goodman, Franz, Copeland, Angold, & Egger, 2014). Similarly, a study of school-entry-aged children revealed that parents of children with either internalizing *or* externalizing disorders reported higher family burden relative to healthy children (Carter et al., 2010).

Despite data supporting significant impairment for young children with psychiatric symptoms, there has been some concern in the field that some of these behaviors (e.g., oppositionality, separation fears) are developmentally normal and should not be pathologized (Campbell, 1991). Indeed, one of the biggest challenges that developmental psychopathologists face is defining the boundary between normative and psychiatrically-relevant behavior in preschool-aged children (Sroufe, 1990). Thus, an important step in defining the boundary between pathological and normative behavior in young children includes examining the predictive validity of psychiatric symptoms. If youth with elevated psychiatric symptom levels go on to experience significant later difficulties across various domains, this supports the validity and clinical significance of those early-emerging symptoms. Recent research has examined the outcomes of a variety of preschool disorders, including depression (Luby et al., 2009), anxiety (Danzig et al., 2013), and conduct disorder (Rolon-Arroyo, Arnold, & Harvey, 2013). These studies support that early psychiatric disorders have important implications for later adjustment.

Thus, early identification of these emotional and behavioral problems may contribute to mitigating adverse long-term consequences for the children who experience them (Carter, Briggs-Gowan, & Davis, 2004).

Peer Functioning in Middle-Childhood

Given the prevalence of early psychiatric symptoms and data suggesting that poor socioemotional functioning puts children at significant long-term risk, better understanding the impact of early symptoms of psychopathology on peer functioning in middle-childhood is important. The developmental period of middle-childhood stands between school-entry and adolescence and is often neglected in research, despite its importance in laying the groundwork for interpersonal functioning through the adolescent transition and into early adulthood (Parker et al., 2006). Socially, age-normative desire for belongingness increases as youth move toward the adolescent period (Baumeister & Leary, 1995), and middle-childhood aged children are motivated to fit in among peers. In fact, it is during this time that status hierarchies become more salient, and social networks reorganize (Parker et al., 2006). However, longitudinal work conducted with young children has mainly focused on shorter-term intervals. Given that studies of early-onset psychopathology have generally not extended follow-up assessments into middle-childhood, the question of how early psychiatric symptoms are tied to social adjustment in this critical period is unanswered.

Child Peer Functioning

Researchers have long been interested in how to best conceptualize children's peer relationships, given the critical role that peers play in children's socioemotional adjustment (McDougall et al., 2001; Parker & Asher, 1987). At the simplest level, children are accepted, rejected, or neglected by peers. Accepted children belong to a peer group and are not actively

disliked. Rejected children are those who are actively disliked by their peers, and this label tends to be relatively stable, meaning that children who are actively disliked by peers at a young age typically remain disliked over the course of childhood (Asher & Coie, 1990). Neglected children are similar to rejected children because they do not belong to a peer group, but they differ because they are not actively disliked. Fortunately for this group, neglected status appears to be less stable over time, with some neglected children eventually becoming accepted (Asher & Coie, 1990). These categorizations are typically assessed by sociometric nomination procedures, which requires that children in an entire classroom or grade record the names of which children they like the best, and which children they like the least. The number of nominations received is how researchers understand whether children are accepted (i.e., the highest number of positive nominations), rejected (i.e., the highest number of negative nominations), or neglected (i.e., not included in the ratings).

Three domains of peer functioning have been emphasized in the literature that are loosely related to the above theoretical understanding (e.g., Ladd, 2006; Parker & Asher, 1987). These indices are acceptance/popularity (related to accepted status), aggressiveness (related to rejected status), and shyness/withdrawal (related to neglected status), all of which predict future adjustment problems. However, the developmental course of these peer-related experiences varies. First, acceptance becomes increasingly relevant as the need for belongingness increases. Thus, children who have more difficulty fitting into a peer group may experience this lack of acceptance more saliently as they age towards the adolescent period. Being accepted by peers is important in all settings, although especially at school and in the neighborhood, since those settings are where children spend the majority of their time. Second, the most commonly observed form of aggression shifts as youth grow older. Broidy and colleagues (2003) examined

the developmental trajectory of early aggressive tendencies and found that physical aggression is observed at much lower rates after preschool. Thus, children who demonstrate high levels of physical aggressiveness during early- and middle-childhood likely experienced aggression problems during the preschool period, since aggression rarely *begins* in middle- or late-childhood. Rather, verbal aggression replaces tendencies toward physical aggression for most children and increases with age (Bierman, 2004). This is partly due to social-cognitive development enabling the practice of relational aggression (i.e., spreading gossip and rumors), such that youth are able to enact harm through non-physical means, like exclusionary experiences and friendship withdrawal (Crick & Grotpeter, 1995). Third, children high on shyness and withdrawal tend to experience more anxiety and rejection, and lower levels of perceived social support among peers (Rubin, Coplan, Bowker, & Menzer, 2011). Shyness and withdrawal can stem from a number of different sources (e.g., temperament [e.g., behavioral inhibition], psychopathology [e.g., anxiety], or peer experiences [e.g., victimization]), becoming especially important in negatively impacting peer relationships in middle-childhood (Deater-Deckard, 2001). In fact, findings indicate that *early* aggressive behaviors are more damaging than early internalizing behaviors on *early* peer functioning but that *older* passively withdrawn children experience increased rates of interpersonal rejection (Ladd, 1999; Rubin, Bukowski, & Parker, 1998) that may approximate that of aggressive children. Thus, there has been substantial interest in better understanding links between broad peer processes and child peer functioning domains. However, the vast majority of studies assessing middle-childhood peer functioning have utilized sociometric nominations or parent- or teacher-reported peer functioning to assess these interpersonal domains, without considering children's self-reported peer experiences.

Notably, prior research among preschool populations has emphasized peer victimization as an outcome, as opposed to general peer functioning factors. This is unfortunate given that victimization is best understood as an outcome that affects relatively few children. Conversely, peer status measures, such as those described above, represent broader domains of peer functioning experienced by many children at some level (e.g., low acceptance, aggressiveness, and shyness/withdrawal). Victimization has been described as lying at the intersection between poor peer relationship functioning and severe maladjustment (Rubin et al., 1998), given the strong associations between victimization and psychopathology (Reijntjes et al., 2010). However, because the current study is focused on broad peer processes among community children, peer victimization is not discussed in the literature review, despite its prevalence in developmental interpersonal relationship research.

Cross-Sectional Research Linking Early-Onset Psychopathology and Peer Processes

The majority of research examining the intersection of peer functioning and psychopathology among preschoolers and early elementary-aged children has been cross-sectional in design, with a particular emphasis on the effects of ADHD-related symptoms (Alessandri, 1992; Campbell, 1990; DuPaul, McGoey, Eckert, & VanBrakle, 2001; Hoza, 2007; Hoza et al., 2005; Keown & Woodward, 2006; Milich, Landau, Kilby, & Whitten, 1982; Wilens et al., 2002) and disruptive behavior problems (Campbell & Cluss, 1982; Keenan & Wakschlag, 2000; Rubin & Clark, 1983). Researchers have found that hyperactive preschoolers are more often rejected, experience less peer acceptance, and engage in significantly more aggression, noncompliance, and nonsocial (e.g., solitary, disengaged) behaviors with peers relative to non-hyperactive control children (Asher & Coie, 1990; Keown & Woodward, 2006). Relatedly, Milich and colleagues (1982) found that teacher and peer ratings of hyperactivity and aggression

were significantly associated with peer nominations of popularity and rejection, with aggressive children being rejected and hyperactive children either being rejected *or* popular during the preschool period. The latter finding suggests that boldness and energy, similar to core symptoms of ADHD, can be attractive to some young children (Milich et al., 1982). Regarding disruptive behavior, Olson (1992) found that preschool boys rated as noncompliant or overactive by teachers were more likely to receive negative sociometric nominations from their peers, and Mikami and Lorenzi (2011) demonstrated that elementary-aged children with conduct problems experienced increased peer relationship difficulty relative to children with low-conduct symptoms. Finally, Hughes and colleagues (2000) showed that "hard-to-manage" preschoolers have significant problems relative to control children in peer play due to negative emotion and antisocial behavior. Importantly, despite the emphasis on externalizing symptoms, Strauss and colleagues (1987;1988) have found that highly anxious elementary-schoolers are also less well-liked and more likely to be rejected by peers relative to non-anxious children.

Longitudinal Research of Early-Onset Psychopathology with Later Peer Functioning

Of the longitudinal work examining the association between early psychiatric symptoms and later social outcomes, problematic externalizing behaviors have again dominated the literature (Campbell, 1995; Campbell, Shaw, & Gilliom, 2000; Keane & Calkins, 2004). For example, Olson and Brodfeld (1991) found that preschool boys who started the year with externalizing problems were more likely to be rejected by classmates at the end of the year. In addition, Campbell & Ewing (1990) conducted a landmark early study that focused on parent-referred "hard to manage" preschoolers' socioemotional adjustment at age 9 relative to healthy controls. Here, "hard to manage" preschoolers were generally inattentive, overactive, oppositional (e.g., displaying temper tantrums and defiance), and experienced difficulty playing

with other children in preschool. Importantly, this group demonstrated significantly greater peer problems related to general social competence and behavioral problems at follow-up in middle-childhood relative to controls. While there are less data to support the longitudinal effects of internalizing problems, there is some empirical support for preschool anxiety having a persisting impact on children's social skills with peers at school-entry above and beyond the effects of depression, ADHD, and ODD symptoms (Danzig et al., 2013).

There are also findings to support the impact of early school-age (i.e., kindergarten through second grade) psychiatric symptoms on later social functioning. It is well documented that ADHD symptoms impact peer functioning in children, with these children being more often rejected and less-well liked over time, even into adolescence (Bagwell, Molina, Pelham, & Hoza, 2001). Although longitudinal associations between early-elementary school anxiety and middle-childhood peer functioning difficulties have been examined, findings are mixed. Some studies support that highly anxious children at school entry experience significantly less peer acceptance later on (e.g., Grover, Ginsburg, & Ialongo, 2007), whereas others provide no conclusive support for such a relationship (e.g., Ialongo, Edelsohn, Werthamer-Larsson, Crockett, & Kellam, 1995). Thus, while the impact of early symptoms is beginning to be explored, their long-term effects on middle childhood peer functioning are still unclear, and the effects of internalizing symptoms are particularly understudied.

Mediating and Moderating Influences on the Relationship between Early-Onset Psychopathology and Peer Functioning

Beyond main effects linking early-onset psychopathology and later peer functioning, there are likely mediating and moderating variables that may more precisely explain this association. For example, mediating variables may help explain the link between preschool

psychiatric symptoms and later peer adjustment. Moderating factors may indicate which children are at greater or lesser risk of experiencing peer difficulties in the face of early psychiatric symptoms.

From a mediation approach, it is probable that a child's socially unskilled behaviors with peers contribute to explaining the link between preschool-onset psychiatric symptoms and peer functioning problems. In a replication of the above findings linking externalizing problems with poor peer adjustment, Keane and Calkins (2004) found that preschoolers with disruptive behavior problems (e.g., oppositionality, aggression) were less liked by their peers in kindergarten. However, the authors extended this finding by asking the children's kindergarten-aged peers about the specific peer-related behaviors these children exhibited. The authors found that peer reports of fighting with peers in kindergarten mediated the relationship between earlier disruptive behavior and concurrent social preference scores for boys, whereas relationally aggressive behaviors (e.g., engaging in "sneaky" behaviors) and prosocial behaviors (e.g., sharing) mediated this same relationship for girls, with the former being associated with *lower* preference scores, and the latter with *higher* social preference scores. However, these findings were cross-sectional for the mediator and outcome variables, so it is unclear whether there were longitudinal effects from the behavioral indices to peer functioning. Together, these findings and data on the importance of social skills in shaping social experiences and allowing opportunity for additional friendship and peer exposure (Blandon, Calkins, Grimm, Keane, & O'Brien, 2010; Gest, Graham-Bermann, & Hartup, 2001; Parker et al., 2006) underscore our need to better understand whether peer-related socially skilled behavior help explains the relationship between early symptomatology and later relationships with peers in middle-childhood. Doing so would

help elucidate the role of early psychiatric symptoms on impacting peer functioning in middle-childhood.

Moderation comes into play because not all children with early psychiatric symptoms will experience subsequent peer problems. Thus, certain factors likely place children at greater risk for experiencing peer difficulties during the middle-childhood period, relative to others. One potential factor is variability in the timing and stability of early-onset psychopathology. For example, Campbell (1987) found that children who had behavior problems in preschool but improved by age 6 experienced fewer peer problems in middle-childhood relative to their counterparts with stable behavior problems. That is, the group who persisted in being "hard to manage" had significantly more peer problems at follow-up relative to other participants, as reported by both parents and teachers. These data suggest that having an early onset of behavioral symptomatology with persisting symptoms contributes to risk for worse peer outcomes in middle-childhood, as one might expect. Unfortunately, the authors did not assess whether children who developed later-onset symptoms were at higher or lower risk for subsequent peer problems relative to the early-onset "hard to manage" group, and there was no early-onset internalizing symptomatology group to compare the externalizing group with. Thus, the role of the timing of psychiatric symptoms (e.g., preschool symptoms vs. school-entry symptoms) in impacting peer functioning in middle-school is understudied and poorly understood.

Parental factors may also moderate the relationship between early-onset psychiatric symptoms and subsequent peer functioning. In particular, parental poor global psychological functioning and marital (dis)satisfaction/discord have been extensively examined in relation to child interpersonal development (e.g., Beardselee, Versage, & Giadstone, 1998; Dickstein et al.,

1998; Gottman & Katz, 1989; Grych & Fincham, 1990; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997) and are thought to impact a variety of developmental outcomes. Indeed, epidemiological data support that children who live with greater parental marital dissatisfaction/separation and poor psychological functioning among mothers experience more stable behavior problems during the transition to elementary school relative to peers (McGee, Silva, & Williams, 1984), which, as discussed above, is associated with peer difficulties (Campbell, Ewing, Breaux, & Szumowski, 1986).

There have been a variety of processes purported to explain the link between parental functioning variables and child interpersonal difficulties, although we will focus on two major behavioral processes here. The first process is social learning, which posits that children mirror behaviors that they learn observationally. According to this model, children who are exposed to parental marital distress and poor global functioning may be more apt to mirror and adopt the dysfunctional behaviors that their parents are modeling (Bandura, 1977). This, in turn, could play a role in poor peer functioning. A second process that could explain links between parental factors and child functioning is through "spillover" effects of family problems (Du Rocher Schudlich, Shamir, & Cummings, 2004; Katz & Gottman, 1996). Spillover addresses the impact of marital distress, for example, on fostering poorer parenting behaviors, which then may partially account for children's continued problems and distress (Webster-Stratton, 1990; Wilson & Gottman, 2002). Indeed, data suggest that young children (ages 4 and 5) experience greater difficulty in behavior problems *and* peer relations when parents are engaged in marital conflict (Katz & Woodin, 2002), so there is reason to suspect that this may be a relevant factor across the childhood developmental period into middle-childhood. In addition, from a diathesis-stress perspective, it is likely that vulnerable children (i.e., those with early psychiatric symptoms) are

at greater risk of being impacted by such environmental spillover effects. Thus, given the emphasis on parenting factors impacting child outcomes, it is possible that parental poor global functioning and marital dissatisfaction may moderate the relationship between early child psychiatric problems and middle-childhood peer functioning.

Finally, child sex is often considered as a potential moderating variable in developmental research, although it is unclear what role child sex might play in linking early-onset psychopathology with middle-childhood peer functioning difficulties. Main effects for gender differences have been much more comprehensively examined. For example, boys are more likely to exhibit ADHD and ODD symptoms relative to girls at a young age, and they are also more likely to be referred for treatment in preschool (Gadow, Sprafkin, & Nolan, 2001). Unfortunately, there are few well-understood sex differences in internalizing symptoms in this age set (Gadow et al., 2001), although previous research supports that girls are more likely than boys to experience anxiety in elementary school (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998), with gender differences for depression not emerging until early adolescence (Nolen-Hoeksema, 2001). Given the data supporting elevated externalizing symptoms in boys, it is not surprising that boys tend to be more physically aggressive than girls (Archer, 2004) when considering the period of middle-childhood that sits between early childhood and adolescence. On the other hand, girls tend to be more relationally aggressive (Crick & Grotpeter, 1995) and shy (Crozier, 1995) relative to boys at this age. Examining the links between early psychiatric symptoms and peer functioning, as moderated by child sex, may help us better understand mechanisms driving this association.

Summary

In sum, there are limited data supporting the link between preschool psychiatric symptoms and poor relationships with peers in middle-childhood. In older children, there are data suggesting that psychopathology negatively impacts broad domains of social functioning, but there are fewer data on this issue in young children. Instead, researchers have primarily focused on peer difficulties predicting subsequent psychiatric problems over time in the younger age set. Given that these relations may be bidirectional, it is important to also examine the relation of early psychopathology on later peer adjustment. Moreover, if these effects exist, it would support the validity and clinical significance of early-onset psychiatric symptoms.

There are also methodological limitations that characterize the current preschool psychopathology literature that need to be addressed. First, of the work that has been done to examine the short-term effects of early psychiatric symptoms on later peer functioning, the great majority has emphasized externalizing symptoms (e.g., ADHD, ODD, behavior problems) as opposed to internalizing symptoms. Second, study designs have largely been either cross-sectional or with very short follow-up periods. Third, previous studies have mainly been limited to informant-reported peer functioning data in middle-childhood (e.g., sociometric nominations; parent- and teacher-report), despite youth's growing cognitive capacity to report on their own emotions and behaviors at this age. Finally, peer victimization has been emphasized over broad domains of social functioning. Thus, there are extremely limited data to understand the impact of early psychopathology on peer functioning in middle-childhood.

The Current Study

The goal of the present study was to evaluate the validity and clinical significance of early-onset psychiatric symptoms by examining the impact of both internalizing (depression, anxiety) and externalizing (ODD, ADHD) symptoms at ages 3 and 6 on peer functioning in

middle-childhood. We elected to examine continuous symptom dimensions rather than categorical diagnoses, as the former are more reliable and powerful relative to dichotomous measures (Hudziak, Achenbach, Althoff, & Pine, 2007) . First, we examined the relative impact of internalizing and externalizing symptoms at age 3 and 6 in predicting key domains of peer functioning in middle-childhood, as reported by children, parents, *and* teachers to cover multiple contexts. Second, we examined whether more proximal socially unskilled behaviors that children use with peers mediated the expected relationship between early psychiatric symptoms and later peer functioning difficulty. Third, we examined potential moderating variables that may place children with early-onset psychiatric symptoms at greater risk for experiencing later peer functioning difficulties. Specifically, we examined the moderating influences of the timing and course of early symptomatology and of parental global functioning difficulties and marital dissatisfaction in predicting children's peer functioning six and three years later. Finally, we explored whether child sex acted as a moderator in the relationship between early-onset psychopathology and peer functioning in middle-childhood.

Based on the literature, we first hypothesized that children with preschool internalizing and/or externalizing symptoms would experience greater interpersonal difficulty with peers in the middle childhood period, and that this association would persist when accounting for concurrent symptomatology. More specifically, we expected that children with early externalizing symptoms would be more apt to experience problems with aggression, whereas children with early internalizing symptoms would experience greater problems with shyness/withdrawal due to persistent withdrawn behavior over the schooling experience. Moreover, we expected that *both* groups would experience difficulty with general acceptance among peers. Second, we expected that socially unskilled behavior with peers in the period

between preschool and middle-childhood would mediate the association between preschool psychiatric symptoms and middle-childhood peer functioning difficulty. Third, we expected that peer functioning difficulties in middle childhood would be more severe if the child continued to experience elevated, stable psychiatric symptomatology from preschool into early elementary school. Fourth, we hypothesized that parental poor general psychological functioning and/or marital dissatisfaction would moderate the relationship between early-onset psychopathology and peer difficulty in middle-childhood, with children who experienced both elevated early psychiatric symptoms *and* had parents with poor functioning or greater marital dissatisfaction being at greater risk of experiencing more subsequent peer functioning difficulties. Finally, mirroring the primary analyses that focus on preschool-onset symptoms, we also expected that there would be links between school-entry psychiatric symptom level and difficulty in peer functioning three years later, following the same pattern as that described above for children with preschool-onset psychopathology.

Method

Participants

Recruitment. The sample was drawn from a suburban community, and families were recruited using commercial mailing lists. Families eligible for participation in the study had a 3-year-old child and at least one biological parent in the household, and they lived within 20 contiguous miles of Stony Brook University. The primary parent was required to speak English, and children with significant medical disorders or developmental disabilities were excluded.

Informed voluntary written consent was obtained from a parent prior to participation. The study was conducted with full IRB approval, and families were monetarily compensated.

Demographics. Approximately two-thirds (66.4%) of the 815 eligible families entered the study and provided diagnostic information about their preschool-aged child (N = 541). Of the initial sample, 462 participants had diagnostic data at the first follow-up around school-entry and 442 participants had diagnostic data at the second follow-up in middle-childhood. Of the initial enrolled sample of 541, 427 parent-child dyads completed questionnaires regarding the child's social behavior with peers six years later, when the child was approximately 9-years-old, which composed the sample for main analyses. A subset of the initial participants' teachers also completed peer measures six years later (N = 287) at the middle-childhood assessment. This subset composed the sample for secondary analyses.

The children in the main sample (N = 427) were roughly half male (53.2%) and primarily White/European-American (87.6%). The mean age of the children at the first assessment was 3.50 years (SD = 0.3), and the mean age at the middle-childhood follow-up assessment was 9.19 years (SD = 0.4), with most of the children being in 3rd (60.6%) or 4th grade (35.2%). The mean ages of the mothers and fathers were 36.1 (SD = 4.5) and 38.3 years (SD = 5.4) at the initial assessment, respectively. The majority of the children's parents were married at the time of the first wave of assessments (94.0%), although this figure decreased somewhat by the middle-childhood follow-up period (85.5%). The sample was generally middle class, as measured by the

Hollingshead's Four Factor Index of Social Status (Hollingshead, 1975; M = 44.9; SD = 11.0), and 57.8% of the mothers and 47.6 % of the fathers had a 4-year college degree or higher.[1]

With one exception, participants in the primary analyses and the remaining participants who initially entered the study but were not included in the primary analyses (N=114) did not differ on the demographic variables mentioned above, preschool psychiatric symptom levels, or peer functioning in middle-childhood. The only difference was that children included in the primary analyses were significantly younger than those not included at the time of the initial assessment (mean age = 42.1 versus 42.8 months, respectively; $t = 2.37$; $p = .02$).

Procedure

The first wave of data collection occurred when the children were 3 years old, and child psychiatric symptoms were assessed using a structured clinical interview with the primary caretaker. Parental global assessment of functioning was also assessed at this point. The second wave of data collection occurred when the children were 6 years old, and psychiatric symptoms were assessed with the same interview used at the prior assessment wave. At this visit, parents were also asked a number of questions about their child's relationships with peers, and they also reported on their own marital (dis)satisfaction. The third wave of data collection occurred when the children were 9 years old, and both parents and children were interviewed about the child's past and current psychiatric symptoms. In addition, parents, children, and teachers reported on the child's peer functioning at this assessment wave.

Measures

Psychopathology.

[1] Demographics were very similar for the smaller sample of participants with teacher-reported peer functioning in middle-childhood (N=287).

Preschool Age Psychiatric Assessment (PAPA; Egger & Angold, 2004; Egger, Ascher, & Angold, 1999). The PAPA is an interview-based structured diagnostic interview that assesses parent-reported psychiatric disorders in preschoolers between age 2 and 5. The primary caregiver reported on their child's psychiatric symptoms using the past 3 months as the primary period. Due to the interview occurring around the time of our participants' sixth birthday, the lack of structured diagnostic interviews appropriate for 6-year-olds, following other recent studies (Luby et al., 2009), and Helen Egger's recommendation (personal communication), we elected to re-administer the PAPA when the children were 6 years old. As an interviewer-based structured interview, the interviewer asked all required questions and elicited examples of relevant behaviors before applying a priori guidelines for rating symptoms using a detailed glossary. Adequate test–retest reliability has been reported using independent interviews (Egger et al., 2006).

The PAPA covers a comprehensive set of symptoms from the DSM-IV-TR (American Psychiatric Association, 2000). Dimensional symptom scales were created by summing items in each diagnostic category. We assessed depression (symptoms of major depressive disorder, dysthymia, and depression not otherwise specified), anxiety (symptoms of specific phobia, separation anxiety, social phobia, generalized anxiety disorder, agoraphobia, selective mutism, and panic disorder), ADHD, and ODD. Because of their rarity at ages 3 and 6, bipolar disorder, conduct disorder, eating disorders, posttraumatic stress disorder, and obsessive–compulsive disorder were not assessed (Egger et al., 2006; Luby, 2006).

Due to concern about interview administration time at the first assessment, we used a parent rating scale to screen for DSM-IV behavioral disorders in 3–6-year-olds. The Early Childhood Inventory-4 (ECI- 4; Sprafkin, Volpe, Gadow, Nolan, & Kelly, 2002) was used in the

first 60% of the sample (n = 324) to determine whether or not to administer the PAPA ADHD and ODD modules. If evidence from this screener indicated the child was very unlikely to meet diagnostic criteria, the interviewer briefly confirmed the absence of ADHD and ODD with the parent. If the parent continued to report that there was no evidence of ADHD and ODD, that section of the PAPA interview was skipped. If there was some evidence of ADHD or ODD sections, the corresponding section of the PAPA was administered. In the remaining 40% of the sample (n = 217), the PAPA ADHD and ODD sections were administered to all parents. ADHD and ODD dimensional scores were estimated for children for whom these sections were skipped using ECI- 4 ADHD and ODD scores and maximum likelihood estimation procedures for missing values (Acock, 2005). This approach is less biased than pairwise and listwise deletion procedures, even with large amounts of missing data (Pastor, 2003). All parents of participants were administered the ADHD and ODD sections of the PAPA in the second assessment wave.

Graduate students in clinical psychology and M.A. level staff members conducted the PAPA interviews after receiving training from a member of the PAPA development group. At age 3, the interviews were conducted by telephone, and at age 6 they were conducted face-to-face. Diagnostic interviews with parents about their children administered by telephone yield equivalent results to in-person interviews (Lyneham & Rapee, 2005). Interviews generally lasted about 1 hour and were primarily conducted with mothers (97.9%).

To examine interrater reliability, a second rater from the pool of interviewers independently rated audiotapes of 21 PAPA interviews at age 3 and 35 interviews at age 6. The interviews were randomly selected, but we oversampled children with mental health problems. At age 3, the intraclass correlations (ICCs) for the dimensional sum scales were .85 for depression, 1.00 for anxiety, .99 for ADHD, and .99 for ODD. At age 6, the ICCs for the

dimensional sum scales were .95 for depression, .71 for anxiety, .97 for ADHD, and .97 for ODD.

Kiddie Schedule for the Affective Disorders and Schizophrenia – Present and Lifetime version (K-SADS-PL; Axelson, Birmaher, Zelazny, Kaufman, & Kay Gill, 2009; Kaufman et al., 1997). The K-SADS is a semi-structured diagnostic interview that was revised to include criteria from DSM-IV (American Psychiatric Association, 2000). The K-SADS is designed to assess a range of psychopathology in children and adolescents, including depression, anxiety, ODD, and ADHD. During the interview, both parents and children reported on child psychiatric symptoms, and the interviewer provided summary ratings for each item based on the responses of both informants. This version of the K-SADS included probes for the present period for the full range of possible psychopathology. Dimensional sum scores for depression, anxiety, ADHD, and ODD were derived on the basis of DSM-IV criteria for each disorder. We used the dimensional scores derived from the screener questions for each form of psychopathology in the K-SADS-PL, since those questions were asked of all participants.

Graduate students in clinical psychology and M.A. level staff members conducted the K-SADS interviews after receiving training from an expert diagnostic interviewer. All interviews were conducted in-person during the age 9 laboratory visit. Parents (91.8% mothers) were interviewed first, with interviews lasting 1-2 hours, and children were interviewed immediately after, with their interviews lasting approximately 1 hour. Significant differences between parent and child report were subsequently reconciled by the interviewer as necessary.

To examine interrater reliability, a second rater from the pool of interviewers independently rated 74 videotapes. The ICCs were adequate for current symptom ratings for depression (.53), anxiety (.82), ODD (.93), and ADHD (.92) screener items.

Peer functioning.

Age 6 assessment.

Ratings of Children's Behaviors (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg et al., 1997). When participants were around the age of school-entry, parents completed this measure. The socially appropriate behavior subscale inquired about whether the child was well-behaved, acted appropriately, got into trouble, and/or had good social skills. (4 items; $\alpha = .74$). This measure was selected as a measure of child socially unskilled behavior with peers.

Age 9 assessment.

K-SADS-PL (K-SADS-PL; Kaufman et al., 1997). Prior to the diagnostic assessment questions in the K-SADS, interviewers assessed child functioning with peers in middle-childhood. Parents and children were asked about the overall quality of the child's functioning with peers at school and in the neighborhood, and the interviewer made an overall summary rating based on information from both informants. For both questions, the scale ranged from 1 (Excellent) to 4 (Poor), with higher scores indicating worse peer functioning. For children who did not live in a traditional neighborhood setting, their answers were marked as 3 (Fair) by the interviewer due to lack of opportunity for these interactions. The same rating decision was made for the few children who were not enrolled in formal schooling unless they had a significant network with fellow local homeschooled children. This measure was included to better understand children's peer group acceptance.

Longitudinal Interval Follow-up Evaluation Range of Impaired Functioning Tool Adapted for Children and Adolescents (Kid-LIFE-RIFT; Fisher, Leon, & Coles, 2002; Leon et al., 1999). Both parents and children were also asked by the interviewer to rate their functioning in a variety of domains, including friendship quality, during the worst week in the past month. The interviewer made a summary rating by combining responses from both informants. The scale ranged from 1 (very good) to 5 (very poor). A rating of "very good" indicated that the child had several special friends that he or she interacted with regularly, either in person or by phone, and felt close to. On the other hand, children who had a rating of "very poor" had no special friends and practically no social contacts. Agreement among raters was adequate for the item (ICC = .55; N = 74). This item tapped children's peer group acceptance.

Social Interaction Survey (SIS; DeRosier, 2001). The SIS measures children's perceived rejection using a single-item. A brief vignette that describes a child in a particular social scenario was presented to assess perceived peer rejection, and the participant was asked to indicate the degree to which they resemble the child described. The item was: "Some kids are very disliked or rejected by lots of other kids in their grade. Often, other kids don't like to play with them or even be on the same team with them. Other kids may try to avoid them or leave them out of their group. How much are you the kind of child that most other kids really don't like?" The response scale ranged from 1 (Not at all) to 10 (Exactly). This item tapped peer rejection; it has been demonstrated to correlate as expected with related self-report measures (Guerra, Asher, & DeRosier, 2004).

Social Support Appraisals Scale (APP; Dubow & Ullman, 1989). Children reported on the social support they receive from peers. The scale is composed of 15 items that tap relationship experiences with friends and classmates; children rated each item on a scale of 1

(Never True) to 5 (Always True). In the original measure, high scores indicate high levels of social support. Here, scores were reverse-coded so that the direction of scoring was consistent across measures in the analyses, with high scores indicating lower levels of peer support. Examples of items are "Do you feel left out by your friends?", "Do your friends like to hear your ideas?" (reverse-scored), and "Do you feel like nobody in your class cares about you?" The measure's validity was established via correlations with measures of global self-esteem, loneliness, peer social preference, and perceived social acceptance (Dubow & Ullman, 1989). Internal consistency was acceptable in this sample ($\alpha = .82$).

Social Anxiety Scale for Children (SASC; La Greca, Dandes, Wick, Shaw, & Stone, 1988). The SASC is a child-reported measure of social anxiety that examines social-evaluative concerns and is related to the shyness/withdrawal domain of peer functioning. In this study, we used the fear of negative evaluation scale, consisting of six items that were scored on a scale from 1 (Never True) to 3 (Always True). High scores indicate higher fear of negative evaluation. Example questions include "I worry about doing something new in front of other kids", "I feel that kids are making fun of me", and "I am afraid that other kids will not like me." Internal consistency was adequate ($\alpha = .72$).

Children's Social Behavior Scale (CSBS; Crick, 1996; Crick & Grotpeter, 1995). The CSBS is a measure that assesses children's social aggression, and includes parent (CSBS-P) and teacher (CSBS-T) versions. Two subscales, overt aggression and relational aggression, were used to measure the extent of these behaviors that the participants engaged in towards peers. Parents and teachers rated each item on a Likert scale from 1 (never true) to 5 (always true). The overt subscale contained four items, and the relational subscale contained five items, with higher scores indicating higher levels of social aggression towards peers for both. Example questions

for the overt aggression subscale include “This child initiates or gets into physical fights with peers” and “This child threatens to hit or beat up other children.” For the relational aggression subscale, example items are “When this child is mad at a peer, s/he gets even by excluding the peer from his or her clique or play group” and “This child spreads rumors or gossips about some peers.” Internal consistency among items was adequate (overt subscale: .81 for parent-report and .79 for teacher-report; relational subscale: .77 for parent-report and .88 for teacher-report). This scale was included to tap into child aggressive tendencies as a broad peer functioning domain.

Child Behavior Scale (CBS; Buhs & Ladd, 2001; Ladd & Profilet, 1996). The CBS is a teacher-rating instrument that assesses a variety of peer-related child behaviors in the classroom, including the extent of children’s exclusion by peers. The peer exclusion subscale consists of seven items rated from 1 (“Does Not Apply”) to 3 (“Certainly Applies”), with higher scores reflecting greater exclusion by peers. Example items are “This child is not chosen as a playmate”, “This child is ridiculed by peers”, and “This child is not much liked.” These behaviors are readily observed by teachers in the classroom, and subscale items are associated with peer report of peer group rejection (Buhs & Ladd, 2001; Ladd & Profilet, 1996). The internal consistency among the items was high ($\alpha = .94$), and this scale tapped into both rejection and withdrawal tendencies.

Parental Characteristics.

Structured Clinical Interview for DSM-IV non-patient version (SCID; First, Spitzer, Gibbon, & Williams, 1992). The SCID is one of the most widely used structured diagnostic interviews, and it has acceptable levels of interrater reliability and procedural validity (Williams, Gibbon, First, & Spitzer, 1992). Around the time of the initial assessment, interviews were conducted with children’s mothers by Master’s level raters via telephone. Results from telephone

interviews are generally consistent with face-to-face interviews (Rohde, Lewinsohn, & Seeley, 1997). The assessment included Global Assessment of Functioning (GAF) score, with a possible range from 1 to 100. The GAF assesses an individual's overall psychological, social, and occupational functioning. The interviewer rated each mother's current GAF (past month), with higher scores indicating better overall functioning. The ICC (n = 30) for this variable was .73.

Dyadic Adjustment Scale – Abbreviated Version (DAS-7; Spanier, 1976). The DAS-7 is a 7-item self-report measure of relationship quality that is widely used to assess marital satisfaction, and it has been demonstrated to be both reliable and valid (Hunsley, Best, Lefebvre, & Vito, 2001). The possible range of scores is 0 to 36. In this study, the DAS was administered to the primary caregiver at the second assessment, when their child was 6 years old (α = .86; score range = 1-21; mean score = 15.99, SD = 3.85), with higher values representing better adjustment.

Data Analytic Plan

The first analytic goal of the study was to derive peer functioning factors for the middle-childhood follow-up data in order to reduce the number of outcome variables. To utilize the full sample, parent- and child-reported peer functioning variables were entered into an exploratory factor analysis together to derive specific domains of peer functioning. The derived factors then served as the dependent variables in the primary analyses described below. The factor analysis used a principal axis factoring extraction method and Promax rotation with Kaiser normalization.

To identify and interpret the factors, I examined a scree plot and the pattern and structure matrices to describe the factors appropriately.

Second, I examined bivariate associations between preschool symptomatology (depression, anxiety, ODD, ADHD) and the middle-childhood peer functioning. These associations were explored two different ways: the first used the peer functioning factors of the full sample (derived from the factor analysis of parent and child reports described above) and the second used scores from the teacher-report scales (overt aggression; relational aggression; exclusion by peers) in the sub-sample of the participants with complete teacher data.

Third, I examined the unique associations between the four preschool symptom dimensions (depression, anxiety, ODD, ADHD) and middle-childhood peer functioning. Again, these associations were analyzed two ways: the first with the parent/child peer functioning factors of the full sample (derived from the factor analysis above) and the second with scores from the teacher-report scales (overt aggression; relational aggression; exclusion by peers) in the sub-sample of the participants with teacher data. I first conducted partial correlations between preschool psychopathology and subsequent peer functioning, controlling for the concurrent symptom dimension (e.g., preschool depression score predicting a derived peer functioning factor, accounting for the concurrent middle-childhood depression score in the analysis) and child sex. This explored the power of early symptomatology to predict later peer functioning over and above the influence of concurrent symptom level and child sex. Next, I included all of the significant symptom dimensions (depression, anxiety, ODD, and/or ADHD) identified in the partial correlation analyses together in a series of multiple regression analyses to examine the unique contribution of particular symptom dimensions in predicting the middle-childhood peer

functioning factors, accounting for child sex, corresponding concurrent symptoms, and other significant symptom dimensions.

Fourth, I examined bivariate associations between the four symptom dimensions from around the time of school-entry (depression; anxiety; ODD; ADHD) and middle-childhood peer functioning. Again, these associations were conducted two ways: first with the peer functioning factors using the full sample (derived from the factor analysis above) and second with the scores from the teacher-report scales in the sub-sample with teacher data.

Fifth, I examined the unique associations between symptomatology around the time of school-entry and middle-childhood peer functioning. Again, these associations were conducted with the peer functioning factors of the full sample (derived above) and teacher-reports in the sub-sample with teacher data. Mirroring the above analyses conducted with preschool symptomatology, I conducted both partial correlations (accounting for concurrent symptoms and child sex) *and* multiple regression analyses (with the significant symptoms identified in the partial correlations) to examine unique longitudinal associations between the symptom dimensions and peer functioning from school-entry to middle-childhood, accounting for child sex, corresponding concurrent symptoms, and other significant symptom dimensions at school entry.

Sixth, I examined whether children's socially unskilled behavior mediated the longitudinal associations between the four preschool symptom dimensions and children's peer functioning in middle-childhood. I tested this hypothesis via mediational analyses in which preschool symptom domains (depression; anxiety; ODD; ADHD) served as the predictor variables, socially unskilled behavior at age 6 served as the mediator, and the middle-childhood

peer functioning factors served as the dependent variables. This model was temporally ordered to match chronology. Analyses were conducted using SPSS AMOS 22.0 (Arbuckle, 2006), and estimates of the means and intercepts of data in the absence of missing values were computed using Full Information Maximum Likelihood (FIML). Predictor variables (i.e., preschool psychopathology) were initially covaried, to estimate specific indirect effects of each type of symptomatology on peer functioning via socially unskilled behavior, which in turn predicted each peer functioning variable, which were themselves covaried, in order to adjust for their shared variance. While there may be concerns that this approach is overly conservative, analyses were repeated while including only one peer functioning variable at a time, but effects were similar in magnitude to those presented here, and so we opted to present only our combined model. Next, based on Wald tests (Fox, 1997), non-significant paths were trimmed to ensure parsimony in the final model. Chi-square difference tests were computed after each deleted path in order to ensure the reduced model did not fit the data significantly worse than the more complex model (i.e., retaining the non-significant path). Presenting fit indices following every deleted path would be exhaustive, and so they are not presented here, but are available upon request. For the final model, we presented chi-square, ratio of chi-square to degrees of freedom (X^2/df), comparative fit index (CFI), and root mean square error of approximation (RMSEA) as measures of goodness of fit. Generally, CFI values > .90 (Hoyle & Panter, 1995), a $X^2/df < 2$ (Carmines & McIver, 1981), and an RMSEA < .08 (Kline, 1998) indicate acceptable fit. Further, multigroup models examined whether any were moderated by gender. Under this approach, chi-square difference tests compare the fit of a model in which each regression path is constrained to be equal across groups to one in which regression paths are free to vary across groups. However, these difference tests revealed no improvement in model fit in the unconstrained compared to the

constrained model, indicating that no regression paths differed significantly across groups. Results were therefore presented for both genders together. Finally, mediational analyses were run for the full sample only, given the power needed to appropriately assess mediation and moderation within a path model.

Seventh, I examined the potential moderating impact of the timing and stability of homotypic early psychiatric symptoms (e.g., preschool and school-entry onset of symptoms) on peer functioning in middle-childhood. I used a series of moderation analyses to examine whether children who had preschool-onset psychiatric symptoms in a particular domain *and* continued to experience elevated symptomatology around the time of school-entry were at increased risk for peer functioning difficulties in middle-childhood. Dimensional psychiatric symptom scores from preschool (age 3) and school-entry (age 6) and their interaction were entered into a hierarchical multiple linear regression model to examine the impact of symptom stability on middle-childhood peer functioning. Following Aiken and West's (1991) procedures for testing moderation, I centered the predictor (preschool depression, anxiety, ODD, and ADHD) and moderator (school-entry depression, anxiety, ODD, and ADHD) variables, created cross-product terms, and entered two statistical blocks in the hierarchical regression analysis. The main effects were included the first block, and the cross-product term was entered in the second block. Consistent with the above analyses, this set of moderation analyses was tested with two sets of outcome variables; the peer functioning factors (derived from the factor analysis using the entire sample) and teacher-reported scores for a subset of the participants.

Eighth, I examined whether parent variables (e.g., global assessment of functioning and marital dissatisfaction when the children were preschool-aged) moderated the association between preschool psychiatric symptoms (depression, anxiety, ODD, ADHD) and peer

functioning in middle-childhood. These moderation analyses were consistent with Aiken and West's procedures outlined above. As above, these analyses were run separately using the peer functioning factors derived from the full sample (via the above factor analysis) and the teacher-reported peer functioning scores for a sub-sample.

Finally, I examined whether there were gender differences in the relationship between preschool psychiatric symptoms and middle-childhood peer functioning factors. This analysis was also conducted using moderation analyses and in accordance with Aiken & West's guidelines. However, because child sex was the moderator and is dichotomous, I did not center it. In addition, this final set of analyses *only* included the peer functioning factors derived from the above factor analysis with the full sample. This analytic decision was made because there was limited power to detect sex differences in the much smaller subsample of participants with teacher reports.

Results

See Table 1 for a full description of means and standard deviations of all study variables.

Middle-Childhood Peer Functioning Factors

To derive specific domains of peer functioning in middle-childhood, principal axis factor analysis (EFA) with a Promax rotation with Kaiser normalization was conducted on the 8 mother- and child-reported peer-functioning variables. The utility of the EFA factor solution was evaluated against the following criteria for factor retention: (a) eigenvalue >1.00 rule (Kaiser-Guttman criterion); (b) scree test (Gorsuch, 1983); and (c) the configuration accounted for at

least 50% of the total variance (Streiner, 1994). We considered variables meaningful when their factor loadings exceeded .30 (Floyd & Wildman, 1995).

Upon examining the scree plot and pattern and structure matrices, a 3-factor solution emerged, which accounted for 62% of the total variance (see Table 2). The first factor represented social discomfort, with child-reported anxiety, rejection, and low support scales comprising the factor (*EV* = 2.53). The second factor represented difficulty with peer acceptance or belongingness, as rated by both children and parents regarding friendship quality in multiple settings (*EV* = 1.42). The third, and final, factor represented children's aggression, both overt and covert, as rated by parents (*EV* = 1.01). These factors all achieved a clear structure with all factor loadings above .35. Correlations among the factors were low-moderate to moderate: .54 for social discomfort and low peer acceptance, .46 for low peer acceptance and aggression, and .20 for social discomfort and aggression.

Relationships between Preschool Symptomatology and Middle-Childhood Peer Functioning Factors

Parent- and child-reported factor scores. Bivariate associations between preschool symptomatology and middle-childhood peer functioning factors were small to moderate (range: .04 to .28; see Table 3). Preschool depression, anxiety, ODD, and ADHD symptoms were all significantly associated with the low peer acceptance and aggression factors at age 9. However, the child social discomfort in peer settings factor was only significantly associated with preschool ODD symptoms.

Next, partial correlations were conducted to further examine associations between preschool symptomatology and middle-childhood peer functioning factors, controlling for child sex and the corresponding concurrent middle childhood symptom dimension (see Table 4 for

complete results). Preschool depression and anxiety continued to predict difficulties with the low peer acceptance factor, even when accounting for concurrent symptoms, but ODD and ADHD symptoms no longer predicted this factor. Similarly, preschool depression, anxiety, and ODD symptoms continued to predict the aggression factor, although ADHD was no longer predictive of middle-childhood aggression. Finally, there was no association among any domain of preschool symptoms in predicting the social discomfort factor when accounting for child sex and concurrent symptoms ($p > .05$ for all analyses).

Last, we used multiple regression analysis to examine unique effects of symptom dimensions predicting middle-childhood peer functioning (Table 5). Child sex and concurrent symptoms were entered into the model as covariates. Child sex, preschool depression, and concurrent depression uniquely predicted the low peer acceptance factor, indicating that boys and children with elevated preschool and concurrent depression scores had the most difficulty with peer acceptance. Anxiety did not uniquely predict difficulty with low peer acceptance when included in the same model as depression. In the second multiple regression model, which predicted the middle-childhood aggression factor, child sex, preschool depression, concurrent depression, and concurrent ODD were each unique predictors of middle-childhood aggression. Similar to the previous model, boys and children with elevated preschool depression and/or concurrent ODD and depressive symptoms displayed elevated aggression scores in middle-childhood. In addition, preschool symptoms of ODD and anxiety no longer predicted the aggression factor when included in the same model as depression.

Teacher-reported scores. Correlations among preschool-age psychiatric symptoms and teacher-reported peer functioning in middle-childhood are shown in Table 6. There were only two significant bivariate associations. The first was between preschool depression symptoms and

teacher-reported relational aggression in middle-childhood, and the second was between preschool ODD symptoms and teacher-reported overt aggression.

Mirroring the full-sample analyses, we next conducted partial correlations, controlling for child sex and concurrent symptom dimensions in predicting middle-childhood teacher-reported peer functioning variables. The results remained consistent with the bivariate correlations, with preschool ODD symptoms continuing to predict overt aggression, and preschool depression still predicting relational aggression, even when controlling for middle-childhood symptom dimensions (see Table 7).

Because there was only one unique effect for each dependent variable, multiple regression was not used to examine the unique effects of symptom dimensions above and beyond one another.

Relationships between School-Entry Symptomatology and Middle-Childhood Peer Functioning Factors

Parent- and child-reported factor scores. Bivariate associations between school-entry symptomatology and middle-childhood peer functioning factors were small to moderate (range: .09 to .33; see Table 3). With one exception, each of the three peer functioning factors (social discomfort; low peer acceptance; aggression) was significantly associated with all of the school-entry symptom domains. The only exception was that school-entry anxiety symptoms were of trend-level significance in predicting the child social discomfort factor.

Next, partial correlations were conducted to examine associations between school-entry symptomatology and middle-childhood peer functioning factors, controlling for child sex and the corresponding middle childhood concurrent symptom dimension (see Table 4). First, school-entry depression and ODD still predicted the social discomfort factor, even when accounting for

concurrent symptoms, although ADHD no longer predicted this factor. Second, all of the school-entry symptoms (depression, anxiety, ODD, and ADHD) continued to predict the low peer acceptance factor, over and above the effects of concurrent symptoms. Third, school-entry depression, anxiety, and ODD predicted the aggression factor above and beyond the role of concurrent symptoms. ADHD, however, no longer predicted aggression difficulties when controlling for concurrent symptomatology.

Last, mirroring the analyses above, we used multiple regression analyses to examine unique effects of symptom dimensions predicting middle-childhood peer functioning (see Table 8). Child sex and the concurrent symptoms were entered into the model as covariates. Child sex and concurrent depression, but no school-entry symptoms, uniquely predicted the social discomfort factor. These findings indicated that, again, males were more likely to report social discomfort, as were children with elevated concurrent depression symptoms. In the second model, school-entry ODD, concurrent depression, and concurrent ADHD predicted the low peer acceptance factor. That is, school-entry depression, anxiety, and ADHD no longer uniquely predicted the low peer acceptance factor when included in the same model as school-entry ODD and all concurrent symptoms. Finally, child sex and school-entry ODD uniquely predicted the aggression factor in middle-childhood.

Teacher-reported scores. Correlations among school-entry psychiatric symptoms and teacher-reported peer functioning in middle-childhood are shown in Table 6. The pattern of findings was consistent, with school-entry symptoms of depression, ODD, and ADHD being significantly associated with relational aggression and exclusion by peers in middle-childhood. No symptom dimensions were significantly associated with overt aggression, and school-entry anxiety was unrelated to aggression (overt or relational) and exclusion by peers.

Mirroring the above analyses, we next conducted partial correlations, controlling for child sex and concurrent symptom dimension in predicting middle-childhood teacher-reported peer functioning variables. No school-entry symptom dimension uniquely predicted teacher-reported middle-childhood overt aggression when controlling for concurrent symptoms. However, school-entry depression and ADHD both uniquely predicted teacher-reported relational aggression against peers, although school-entry ODD no longer predicted relational aggression once concurrent symptoms were accounted for. Finally, school-entry depression symptoms predicted teacher-reported exclusion by peers, even when accounting for concurrent symptomatology. See Table 7 for the full set of correlations.

We ran a multiple regression analysis to examine the unique contributions of depression and ADHD in predicting teacher-reported relational aggression in middle-childhood. Child sex and concurrent symptom dimensions were included as covariates in the analysis. Results indicated that being female and school-entry ADHD symptoms uniquely predicted teacher-reported relational aggression three years later. Concurrent ADHD symptoms were of trend-level significance, and school-entry and current depressive symptoms were no longer predictive of relational aggression. See Table 9.

Mediational Mechanism of Socially Unskilled Behavior

It is possible that socially unskilled behavior around the time of school-entry contributes to the association between preschool psychopathology and peer functioning difficulty in middle-childhood. I tested this hypothesis via mediational analyses in which preschool symptom domains (depression; anxiety; ODD; ADHD) served as the predictor variables, socially unskilled behavior at age 6 served as the mediator, and the middle-childhood peer functioning factors served as the dependent variables. Child sex was included as a covariate. All predictor variables

were covaried with one another, and all dependent variables were also covaried with one another. Our initial model is depicted in Figure 1.

The final model (i.e., after non-significant paths and covariances were trimmed) yielded the following fit indices: X^2 (18, N = 36) = 37.75, p = .004, X^2/df = 2.10, CFI = .981, RMSEA = .045. While the X^2/df value was somewhat high, CFI and RMSEA values suggested an adequate fit to the data.

Figure 2 presents the standardized parameters for the final model. Child sex was included as a covariate in the model, and being male was significantly associated with greater socially unskilled behavior. Further, at baseline, preschool ODD and ADHD symptoms were significantly predictive of socially unskilled behavior at school-entry, with greater symptom level predicting higher levels of unskilled behavior. There was a trend-level association between preschool depressive symptoms predicting socially unskilled behavior three years later, with elevated depression associated with *less* unskilled behavior. Anxiety was unrelated to socially unskilled behavior. In turn, socially unskilled behavior predicted all three peer functioning factors, with more unskilled behavior predicting greater peer difficulty across domains. Regarding indirect effects from symptomatology to peer functioning, ODD predicted the social discomfort factor through socially unskilled behavior, 95% CI [.003, .01], as did ADHD, 95% CI [.002, .01]. The same pattern was observed for externalizing symptoms predicting the low peer acceptance factor through socially unskilled behavior, for ODD, 95% CI [.007, .02], and ADHD, 95% CI [.005, .02]. Finally, both ODD (95% CI [.006, .02]) and ADHD (95% CI [.004, .01]) symptoms predicted the aggression factor via socially unskilled behavior. There was no evidence of depression or anxiety indirectly predicting peer functioning difficulty through socially unskilled behavior.

Moderational Mechanisms

Timing and stability of homotypic early-onset symptoms. The following series of moderation analyses were conducted to examine whether children who had preschool-onset psychiatric symptoms in a particular domain *and* continued to experience elevated homotypic continuity in symptoms around the time of school-entry were at increased risk for peer functioning difficulties in middle-childhood. We were also interested in the unique effects of timing of psychopathology on later peer difficulties. Four separate regression analyses (one per symptom domain) were conducted for each peer functioning variable, for a total of twelve regression models. As above, the regression analyses that included homotypic symptom interactions were conducted separately for the full sample, using parent- and child-reported factor scores (see Table 10 for regression models), and for a subsample of children with teacher-reported peer functioning (see Table 11 for regression models).

Although interactions were the statistics of interest in the following moderation analyses, there were a number of main effects observed for early-onset symptoms in patterns similar to above. For example, there was evidence of preschool depressive and anxiety symptoms predicting the aggression factor. There was also consistent evidence of school-entry symptoms across all domains predicting the child social discomfort, low peer acceptance, and aggression factors. For the teacher-reported variables, there was evidence of preschool depression and school-entry externalizing symptoms predicting relational aggression. Finally, school-entry depressive, ODD, and ADHD symptoms predicted children being excluded by peers, as reported by teachers.

Parent- and child-reported factor scores. Our first set of regression models examined the interaction of homotypic symptoms at age 3 and 6 on the middle-childhood social discomfort

factor. The two externalizing symptom models (e.g., ODD and ADHD) were similar. In both, there was a significant homotypic interaction for each of the diagnostic domains (t = -2.27, p = .02 for ODD; t = -2.54 p = .01 for ADHD) on later child social discomfort with peers (see Figures 3 and 4). The simple slopes were significant for each group of children in both models, meaning that children with elevated age 3 ODD symptoms had significantly greater social discomfort at age 9 when their ODD symptoms persisted at age 6 (B = .05, SE = .01; t = 3.69, p < .001), *and* that children who had low age 3 ODD symptoms had significantly higher social discomfort when they experienced an onset of ODD symptoms by age 6 (B = .10, SE = .01; t = 7.69, p < .001). The same was true for ADHD, as children who had elevated age 3 ADHD symptoms experienced significantly more subsequent social discomfort when their ADHD symptoms persisted to age 6 (B = .04, SE = .01; t = 8.34, p < .001), *and* children who had low age 3 ADHD symptoms but developed elevated symptoms by age 6 experienced more subsequent social discomfort (B = .06, SE = .004; t = 14.00, p < .001). In addition, for both interactions, there was a crossover that indicated a steeper slope for the group of children with low symptoms at age 3 but elevated symptoms at age 6. There were no interactions in the depression or anxiety models.

Next, we ran four separate regression analyses that examined the impact of early psychopathology in each domain on difficulty with peer acceptance in middle-childhood. There were significant homotypic interactions for anxiety (t = -3.36, p = .001) and ADHD (t = -2.71, p = .007), but not for depression or ODD. For anxiety, the pattern of interaction indicated that children who had low anxiety in preschool but elevated anxiety at age 6 were significantly less accepted among peers in middle-childhood relative to children who had stable low anxiety symptoms across early childhood (B = .03, SE = .01; t = 5.05, p < .001). On the other hand, there

was no difference in peer acceptance among children who had elevated anxiety symptoms at age 3, regardless of symptom level at age 6 (B = .01, SE = .01; $t = 1.10$, $p > .05$). That is, children who had age 3 symptoms but "recovered" by age 6 were similarly less accepted among peers relative to children with elevated anxiety symptoms at both time points (see Figure 5), and low acceptance was high relative to children with persistently low anxiety symptoms. Alternatively, for the homotypic ADHD interaction model, we observed a significant increase for difficulty in peer acceptance for children with elevated age 6 ADHD symptoms, regardless of whether they had elevated ADHD symptoms at age 3 (B = .06, SE = .01; $t = 4.05$, $p < .001$) or not (B = .08, SE = .01; $t = 5.84$, $p < .001$; see Figure 6). However, there was a steeper slope for the group of children with low ADHD symptoms at age 3 but elevated symptoms by age 6 relative to children who had elevated preschool ADHD symptoms.

In the final set of analyses predicting middle-childhood peer functioning factors, we examined the impact of early-onset psychopathology and their homotypic interactions in predicting the aggression factor. There were interactions for anxiety ($t = -2.07$, $p = .04$), ODD ($t = -2.27$, $p = .02$), and ADHD ($t = -2.02$, $p = .04$). The pattern of interaction for anxiety was the same as that observed above in the anxiety model predicting low peer acceptance (see Figure 7). That is, children who had low anxiety in preschool but elevated anxiety at age 6 were significantly more aggressive relative to children who had stable low anxiety symptoms (B = .02, SE = .01; $t = 3.09$, $p = .002$). On the other hand, there was no difference in aggression among children who had elevated anxiety symptoms at age 3, regardless of symptom level at age 6 (B = .004, SE = .01; $t = 0.68$, $p > .05$), and aggression levels were high relative to children with stable low anxiety. In addition, the homotypic interactions for the externalizing domains were similar to one another (see Figures 8 and 9), and to the pattern observed in the ODD and ADHD homotypic

interactions described above. Specifically, we observed a significant increase in aggression for children with elevated ODD at age 6 relative to those with low age 6 ODD symptoms, regardless of whether they had elevated symptoms at age 3 (B = .06, SE = .01; $t = 5.20$, $p < .001$) or not (B = .11, SE = .01; $t = 9.82$, $p < .001$). The same was true for the ADHD model, with significant increases in aggression reported for children who had elevated age 6 symptomatology, regardless of whether they had high symptoms at age 3 (B = .03, SE = .004; $t = 8.41$, $p < .001$) or a history of low ADHD symptoms (B = .05, SE = .004; $t = 11.57$, $p < .001$). As we observed earlier, there was a steeper slope for the group of children with low symptoms at age 3 but elevated symptoms at age 6 in both models.

Teacher-reported scores. Regression models were also run to examine the three teacher-reported peer functioning variables at the middle-childhood assessment. The first set of regression models examined the impact of symptoms at age 3 and 6, as well as their homotypic interactions, on the middle-childhood teacher-reported overt aggression. We observed a significant homotypic interaction for age 3 ADHD and age 6 ADHD ($t = -1.95$, $p = .05$) on later teacher-reported overt aggression (Figure 10). Similar to the interactions described above, this pattern of interaction also suggested that children with elevated ADHD symptomatology at age 6 were more likely to overtly aggress at age 9. However, this relationship was only statistically significant for children with low ADHD symptoms in preschool (B = .07, SE = .03; $t = 2.24$, $p = .03$). That is, children with stable low ADHD symptoms displayed significantly lower levels of overt aggression against peers relative to children who were low on ADHD symptoms in preschool but developed them by age 6. There was no statistical difference among children with high ADHD symptoms at age 3, regardless of ADHD symptom score at age 6.

In the set of models predicting teacher-reported child relational aggression in middle-childhood, there were homotypic interactions for depression ($t = 2.65$, $p = .01$) and ODD ($t = 2.09$, $p = .04$). The interaction for depression showed a different pattern than others observed (see Figure 11), with children who had elevated age 3 depression relationally aggressing more against peers if they also had elevated age 6 depression symptoms; however, this simple slope was not significant. On the other hand, children with low preschool depressive symptoms who developed elevated symptoms by age 6 relationally aggressed *less* against peers relative to those with low depressive symptoms at both time points, although that simple slope was not significant either. Next, the homotypic interaction for ODD symptoms, as shown in Figure 12, demonstrates that children who had elevated ODD symptoms at ages 3 and 6 were significantly more relationally aggressive against peers relative to those who had elevated ODD symptoms in preschool but not at age 6 (B = .26, SE = .11; $t = -2.45$, $p = .02$). There was no association between age 6 ODD symptom level and relational aggression among children with low preschool ODD symptoms.

The final set of homotypic symptom models predicted age 9 teacher-reported exclusion by peers. There were significant homotypic interactions for depression ($t = 3.31$, $p = .001$) and ADHD ($t = -2.53$, $p = .01$). For the depression model, the interaction showed that children who had elevated depression symptoms at ages 3 and 6 were significantly more often excluded by peers relative to the children who had elevated depressive symptoms in preschool but who had "recovered" by age 6 (B = .24, SE = .04; $t = 5.46$, $p < .001$; see Figure 13). However, there was no difference in being excluded by peers among children with low age 3 depression symptoms, regardless of age 6 depression scores, and in fact, children with low depression tended to be excluded by peers at a stable elevated level. In addition, the interaction in the ADHD model

suggested that children who had elevated ADHD symptoms at age 6 were significantly more likely to be excluded by peers (see Figure 14). This was true for children who had previously elevated symptoms at age 3 but "recovered" by age 6 (B = .22, SE = .05; $t = 4.73$, $p < .001$) and for children with stable low ADHD symptoms at both early symptom assessments (B = .28, SE = .05; $t = 6.05$, $p < .001$), although there was a steeper slope for the group of children who had low ADHD symptoms in preschool but developed symptoms by age 6.

Parental variables. Next, the following set of moderation analyses were conducted to examine whether parental factors (i.e., global assessment of functioning score [GAF] and dyadic adjustment score [DAS]) moderated the relationship between preschool-onset child symptoms and later peer functioning difficulties in middle-childhood. Four separate regression analyses (one per symptom domain) were conducted for each of the three peer functioning variables, for a total of twelve multiple regression analyses. As above, these regression analyses were conducted separately for the full sample, using parent- and child-reported factor scores, and for a subsample of children with teacher-reported peer functioning.

Global assessment of functioning.

Parent- and child-reported factor scores. See Table 12 for these regression models. Again, while interactions were the statistics of interest in the following moderation analyses, there were a number of main effects observed for early-onset symptoms. Symptoms of depression, ODD, and ADHD in preschool predicted both the low acceptance and aggression factors. Further, for teacher-reported peer variables, preschool ODD symptoms predicted overt and relational aggression, and preschool depressive symptoms predicted relational aggression. Finally, there was a main effect for parental GAF observed consistently across models predicting

factor scores, with low parental global functioning scores predicting greater social discomfort, low peer acceptance, and aggression.

Our first set of regression models examined the interactions of age 3 symptoms and parental GAF on the middle-childhood social discomfort factor: none of the interactions were significant.

The second set of regression models examined interactions of age 3 symptoms and parental GAF on the middle-childhood low peer acceptance factor. There was a significant interaction for age 3 depression symptoms X GAF in predicting difficulty with peer acceptance (t = -1.98, p = .05; see Figure 15). The pattern of interaction suggested that children with elevated depression symptoms at age 3 *and* a parent with a low GAF score had significantly more difficulty with peer acceptance in middle-childhood relative to low-depressed children whose parent had a low GAF score (B = .08, SE = .01; t = 7.58, p < .001). Among children of parents with high GAF scores, there was no difference in peer acceptance difficulty in light of preschool depressive symptoms.

The final set of regressions for the factor scores examined the interactions of age 3 symptoms and parental GAF on the middle-childhood aggression factor. We again observed an age 3 depressive symptoms X GAF interaction when predicting the aggression factor (t = 3.03, p = .003; see Figure 16). The pattern of interaction suggested that among children of parents with high GAF scores, greater preschool depression symptoms were associated with a significantly higher level of aggression (B = .15, SE = .02; t = 7.89, p < .001). In contrast, among children of parents with low GAF scores, fewer depression symptoms at age 3 significantly predicted more aggression (B = -.03, SE = .01; t = -2.58, p = .01).

Teacher-reported scores. In the set of regressions that examined the main effects and interactions of age 3 symptoms and parental GAF on the middle-childhood teacher-reported symptoms, we again examined the outcome variables of overt aggression, relational aggression, and exclusion by peers (see Table 13). There were no interactions observed between age 3 symptoms and parental GAF on middle-childhood teacher-reported overt aggression, relational aggression, or exclusion by peers.

Marital dissatisfaction.

Parent- and child-reported factor scores. See Table 14 for these regression models. There were a number of main effects observed for early-onset symptoms that were consistent with previous findings throughout the next set of moderation analyses. Again, all preschool symptom domains predicted the low acceptance and aggression factors. Further, for teacher-reported peer variables, preschool ODD symptoms predicted overt and relational aggression, and preschool depressive symptoms predicted relational aggression. Finally, there was a main effect for parental DAS observed consistently across models predicting factor scores, with low parental marital satisfaction scores predicting greater social discomfort, low peer acceptance, and aggression, as well as higher levels of teacher-reported exclusion by peers.

Our first set of regression models examined the interactions of age 3 symptoms and parental DAS on the middle-childhood social discomfort factor. There were no significant interactions among variables in predicting the social discomfort factor.

The second set of regression models examined the interactions of age 3 symptoms and parental DAS on the middle-childhood low peer acceptance factor. Again, there were no significant interactions between age 3 symptom and parental DAS in predicting difficulty with peer acceptance in middle-childhood.

The final set of regressions for the factor scores examined the interactions of age 3 symptoms and parental DAS on the middle-childhood aggression factor. We observed an age 3 depressive symptoms X DAS interaction when predicting the aggression factor (t = -2.41, p = .02; see Figure 17). The pattern of interaction suggested that children with elevated preschool depression symptoms had significantly greater aggression with peers relative to their counterparts, when their parents had low DAS (B = .12, SE = .01; t = 8.16, p < .001) *or* high DAS scores (B = .04, SE = .02; t = 2.24, p = .03), although it was a steeper slope gradient for children whose parents reported greater marital dissatisfaction (i.e., low DAS).

Teacher-reported scores. See Table 15 for these regression models. When using teacher-reported peer functioning variables, we first examined overt aggression as the dependent variable, followed by relational aggression as the outcome. There were no interactions in these models.

Next, we examined the interactions of age 3 symptoms and parental DAS on middle-childhood teacher-reported exclusion by peers. There was an interaction between age 3 depression symptoms and parental DAS (t = -2.13, p = .01; see Figure 18). The pattern of interaction suggested that children with elevated depression symptoms at age 3 *and* whose parents had low DAS were significantly more frequently excluded by peers relative to their non-depressed counterparts whose parents reported low marital satisfaction (B = .19, SE = .06; t = 3.39, p = .001). There was no difference in being excluded by peers among children of parents with high DAS, regardless of preschool depressive symptomatology.

Gender effects. We observed consistent main effects for gender throughout the moderation analyses. For the most part, they mirrored the main effects observed in bivariate and

partial correlations. Boys were consistently more likely to have difficulty with the three peer functioning factors: social discomfort, low acceptance among peers, and aggression, relative to girls. In addition, boys were more likely to be rated by teachers as expressing overt aggression, whereas teachers rated girls as more often relationally aggressing against peers. The only dependent variable without observed gender effects was for teacher-reported exclusion by peers.

The final set of moderation analyses were conducted to examine whether child sex moderated the relationship between preschool-onset child symptoms and later peer functioning difficulties in middle-childhood. Four separate regression analyses (one per symptom domain) were conducted for each of the three peer functioning variables, for a total of twelve multiple regression analyses. These analyses were only conducted for the full sample (see Table 16). There were no sex interactions observed in any of the analyses.

Discussion

The goal of this study was to examine the impact of early-onset psychiatric symptoms on peer relationship functioning in middle-childhood. Research demonstrating the long-term impact of early psychiatric symptoms lends validity to their clinical significance; in addition, these findings contribute to further defining the boundary between normative and psychiatrically-relevant behavior in young children. While the majority of previous literature has emphasized the role of externalizing symptoms on cross-sectional outcomes, we examined internalizing (depression; anxiety) *and* externalizing (ODD; ADHD) symptomatology together in predicting subsequent peer functioning at age 9 in a longitudinal study, finding effects for the impact of

early-onset psychiatric symptoms across multiple domains of peer functioning. Our most exciting findings included the significant unique effects of preschool-onset depressive symptoms predicting subsequent low peer acceptance and aggression with peers, over and above other symptom domains in early childhood, and after accounting for concurrent depression scores. In addition, we observed that children with school-entry-onset psychiatric symptoms consistently evidenced increased peer difficulty in middle-childhood relative to those with low symptoms at school-entry, although children with "recovered" preschool symptoms at age 6 appeared qualitatively worse than children with stable low symptoms. Further, we observed interactions of preschool-onset depressive symptoms with parental functioning variables (GAF, DAS). Findings indicated that children who had elevated depression scores *and* a primary parent with poor psychiatric functioning and/or marital dissatisfaction were significantly more prone to low acceptance among peers, elevated aggression levels, and greater exclusion by peers.

Middle-Childhood Peer Factors

The first step in approaching this research question was to factor analyze parent- and child-reported peer functioning variables in middle-childhood. Three factors emerged in this analysis: the first was comprised of child-reported social anxiety, perceived rejection by peers, and perceived low levels of social support. Thus, this was a heterogeneous factor with a theme of discomfort and/or dissatisfaction in social settings, as rated by children themselves. The second factor represented difficulty with peer acceptance, and was the only factor to include both parent- and child-reported ratings. This was a less specific factor than the others, yet provided a broader perspective as to overall acceptance by documenting belongingness (or lack thereof) in peer groups across multiple settings (school; neighborhood). The third factor was an aggression factor, with both overt and covert indices of aggression loading onto this factor. Children did not

report on their own aggressive tendencies, and so this factor was comprised only of parent-report. Although there were possible informant-related influences in the composition of these factors (i.e., child-only report for Factor 1, and parent-only report for Factor 3), the correlations among them were moderate and significant. The lowest correlation among the factors was between social discomfort and aggression, which could reflect the difference in informants and/or the conceptual distinction between the factors (i.e., social discomfort as related to internalizing difficulty, and aggression as related to externalizing problems). Despite this, the three derived factors related to the broad domains of peer functioning described previously in the literature.

There is a bevy of peer relationship research that has used different methodology (e.g., sociometric nomination) to conceptualize children's peer status, and our broadest understanding is that children are accepted, neglected, or rejected by peers (e.g., Asher & Coie, 1990). Domains of peer functioning (acceptance/popularity, aggressiveness, and shyness/withdrawal) have been loosely mapped onto this theoretical understanding (e.g., Ladd, 2006; Parker & Asher, 1987), and the factors derived in this study were closely linked to these three domains. Indeed, our first factor of social discomfort was related to shyness/withdrawal, the second factor of difficulty with peer acceptance was inversely related to acceptance/belongingness to a peer group, and the third factor was overt and relational aggression, which wholly captures aggressiveness. Thus, there was strong theoretical and empirical backing for the peer functioning domains derived using this community sample data.

Main Effects of Preschool-Onset Symptoms

Previous research supports that young children are capable of experiencing significant psychiatric symptoms. Historically, researchers have focused on the impact of externalizing (i.e.,

ODD; ADHD) rather than internalizing (i.e., depression; anxiety) symptoms, using primarily cross-sectional research as opposed to longitudinal design. Using both internalizing and externalizing preschool symptoms as predictors, we first hypothesized that elevated preschool-onset symptoms in *any* domain would predict difficulty with peer acceptance, and our results partially supported this. Indeed, bivariate correlations revealed significant associations between each domain of preschool-onset symptoms and difficulty with peer acceptance six years later, although when concurrent symptoms were controlled for in subsequent partial correlations, only preschool-onset depression and anxiety continued to predict difficulty with peer acceptance. That is, there was a unique impact of preschool-onset depression and anxiety on low peer acceptance beyond the effects of current symptoms at age 9, which was not observed for children with preschool-onset ODD or ADHD symptoms. This suggests that internalizing symptoms in preschool have a lasting impact on later difficulty with peer acceptance in ways that externalizing symptoms do not. Further, when including preschool *and* concurrent depression and anxiety symptoms in the same model, depressive symptoms at both time points emerged as the only unique predictors of difficulty with peer acceptance in middle-childhood. These findings stand in contrast to previous research that identified hyperactive and disruptive preschoolers as the most rejected and poorly accepted by peers, both concurrently (Asher & Coie, 1990; Keown & Woodward, 2006; Olson, 1992) and in a short-term follow-up study (Olson & Brodfeld, 1991). Given the dearth of understanding about depression in young children, observing the unique lasting impact of these symptoms over a 6-year period underscores their clinical significance.

Elevated preschool-onset symptoms in all domains also predicted the aggression factor at age 9, and persisted when including concurrent symptom level at age 9 for depression, anxiety,

and ODD. When each of these symptom domains from preschool and age 9 were included together in a model, preschool depression was the only early-onset symptom domain to significantly predict aggression at age 9. Thus, we again observed a unique effect of preschool depression, this time predicting later aggression beyond the effects of preschool anxiety and ODD, even when accounting for depressive symptoms at age 9. This finding stood in contrast to Campbell & Ewing's (1990) findings that "hard to manage" preschoolers (i.e., elevated ADHD and ODD symptoms) had more behavioral problems in middle-childhood, although perhaps this difference was observed because they did not measure depressive symptomatology in their sample.

There was less evidence of preschool-onset symptoms predicting difficulties in social discomfort at age 9. The only significant bivariate correlation was for ODD, and that relationship disappeared when concurrent ODD was included in the model, suggesting that concurrent ODD symptoms better account for social discomfort. This may have been a reflection of informant biases, as early-onset symptoms were based on parent report, and the social discomfort factor at age 9 included only child-reported peer functioning difficulty. Alternatively, this finding may have reflected that social discomfort is most accurately reflected in current symptomatology, the latter of which likely contributes to negative peer processes.

As for associations between preschool-onset symptoms and teacher-reported peer functioning difficulties in middle-childhood, only two relationships emerged. The first was preschool depressive symptoms predicting relational aggression, and the second was preschool ODD symptoms predicting overt aggression. Both of these relationships persisted when concurrent homotypic symptoms were included in partial correlations. The specificity of these findings over a six-year period and across informants was exciting. The relationships were as

expected, given the evidence of relational aggression and depression coupling together (e.g., Murray-Close, Ostrov, & Crick, 2007), and overt aggression and ODD being closely linked as key components of disruptive behavior.

Main Effects of School-Entry Symptoms

When examining the impact of elevated school-entry symptoms, the pattern of findings diverged somewhat. Overall, associations between school-entry symptoms and later peer functioning difficulty across all three factors were significant, and many of these relationships persisted when controlling for child sex and concurrent symptom level. Thus, there was less specificity between internalizing and externalizing symptoms predicting peer domains, relative to the preschool symptom analyses. In addition, there was some evidence of school-entry anxiety predicting later peer difficulty, which is a symptom domain with mixed support in previous research for predicting peer problems (e.g., Grover et al., 2007; Ialongo et al., 1995).

We observed significant correlations between each symptom domain at age 6 and increased difficulty in peer acceptance at age 9. Thus, children who experienced increased internalizing *or* externalizing symptoms around the time of school-entry were at increased risk for low peer acceptance three years later, regardless of continued elevated symptomatology. This was consistent with prior research that has documented that children with disruptive problems had peer relationship difficulties (Mikami & Lorenzi, 2011), *and* that highly anxious children had increased rates of peer rejection (Strauss et al., 1987; Strauss et al., 1988). Because the follow-up period in our study encompassed the same cohort of children (i.e., kindergarten or first grade through third or fourth grade), it may have been that peers recognized children with increased symptoms early on, and it was difficult for symptomatic children (regardless of "type") to recover socially in the face of peers. However, when all school-entry and concurrent symptom

dimensions were entered together in one model, it was school-entry ODD that uniquely predicted the low peer acceptance factor longitudinally. This pattern of findings stood in contrast to the longitudinal effects of depressive symptoms observed from preschool to middle-childhood in this study. It is possible that irritability, a trait observed in both depression and ODD, manifested differently from preschool to school-entry. Another explanation is that there was heterotypic development of depressive symptoms into oppositional/defiant symptoms in childhood, as previously documented in this sample (Bufferd, Dougherty, Carlson, Rose, & Klein, 2012).

There were also significant bivariate correlations between all age 6 symptom domains and the aggression factor. Identical to the preschool-onset symptom analyses, partial correlations revealed that these relationships persisted when including concurrent symptom level at age 9 for depression, anxiety, and ODD. However, when school-entry and concurrent depression, anxiety, and ODD symptoms were included together in a model, school-entry ODD was the only significant predictor of the aggression factor, above and beyond the impact of concurrent symptoms, which supported ODD's clinical significance and predictive validity over a 3-year period. Indeed, of the symptom domains examined, ODD has the closest link with aggression, given diagnostic criteria such as often losing temper, arguing with adults, and being angry/resentful or spiteful/vindictive, so this link is theoretically supported.

There was more evidence for social discomfort relating to age 6 symptoms, relative to preschool symptoms. Indeed, the social discomfort factor was associated with school-entry depression, ODD, and ADHD, although only relationships for depression and ODD persisted when accounting for current symptomatology. When school-entry and concurrent depression and ODD symptom scores were included in the same model, concurrent depression was the only symptom score that uniquely explained the relationship between psychiatric symptoms and

child-reported social discomfort in middle-childhood, suggesting that there was little evidence for pre-existing symptoms to impact social discomfort in middle-childhood over and above current symptoms. It is probable that children with elevated social discomfort experience elevated symptoms across childhood, such that current symptoms fully explain the longitudinal relationship and wash out the effect of earlier symptoms. Regardless, this finding was consistent with the relatively less-robust associations of the social discomfort factor with preschool-onset psychiatric symptoms.

There was a different pattern of findings when examining associations between school-entry symptoms and teacher variables. Teacher reports of children's relational aggression and exclusion by peers at age 9 were related to symptoms of depression, ODD, and ADHD three years prior. Partial correlations, controlling for concurrent symptoms, revealed a unique effect of school-entry depressive symptoms on both relational aggression and exclusion by peers, as well as a unique effect of school-entry ADHD on relational aggression at age 9. However, when age 6 and 9 symptom scores for depression and ADHD were included in the same model, school-entry ADHD was the only unique symptom predictor of relational aggression, as reported by teachers. This finding was consistent with the literature that supports elevated levels of relational aggression in ADHD children (e.g., Zalecki & Hinshaw, 2004), which may have to do with the impulsive tendencies associated with ADHD. Interestingly, no symptom dimensions were associated with overt aggression, which may have had to do with the restricted range of overt aggression in middle-childhood given its lower prevalence by this age (Broidy et al., 2003). Further, school-entry anxiety was not predictive of peer problems as reported by teachers in middle-childhood, which added to the mixed findings that have failed to consistently link anxiety with peer problems.

Mediational Mechanisms

We next hypothesized that children's socially unskilled behavior with peers in the interim period between preschool and middle-childhood would mediate the relationship between preschool-onset symptoms and subsequent peer functioning. That is, we expected that children with early symptoms would *behave* in maladaptive ways around the time of school-entry that would impact how peers viewed them in middle-childhood. Our results suggested that this was true for externalizing children, but not children with internalizing symptoms. That is, socially unskilled behavior at school-entry explained the link between early-onset externalizing symptoms and peer relationship functioning difficulty six years later. Because externalizing disorders are behavior-based problems, perhaps it is not surprising that impulsive and oppositional children were acting in socially unskilled ways with peers, which then promoted further aggression, social discomfort, and low acceptance among peers. On the other hand, depression/anxiety are defined as emotion-based problems, which children can internalize more, and may be less obvious to their peers. The results supported that any effect of internalizing symptoms was due to their overlap with externalizing symptoms.

Indeed, there were no links between early anxiety symptoms and peer functioning that were best explained by socially unskilled behavior, and only trend-level effects for depression. This suggests that there are other mechanisms at play that further contribute to explaining the relationship between early internalizing symptoms and later peer problems. Given the associations between depression/anxiety and emotional dysregulation (Zeman, Shipman, & Suveg, 2002), it may be that these children have appropriate social skills, but it is emotion regulation difficulty that sets the stage for peer problems. Alternatively, and possibly as a result of poor emotion regulation, children with internalizing symptoms fail to form close relationships

in early childhood and do not develop early friendship skills that are the basis for later appropriate interpersonal functioning (Parker et al., 2006). Finally, shyness and social withdrawal predominate among anxious children, and this could further contribute to lack of friendship-forming abilities.

Moderational Mechanisms

Timing and stability of homotypic early-onset symptoms. Third, we expected that peer functioning difficulties in middle-childhood would be more severe if a child continued to experience stable homotypic psychiatric symptoms from preschool into early elementary school. While we observed a number of instances of moderation, they did not indicate that children with persisting homotypic symptoms were significantly more impaired in terms of peer relationship functioning than children with single time-point psychiatric symptoms, as we expected based on Campbell's (1987) previous findings.

Instead, for the homotypic interactions predicting factor scores, we found that children with elevated symptoms at age 6 had increased peer difficulty in middle-childhood, regardless of preschool symptom level. However, age 3 symptoms had some effect across analyses, as children with a history of elevated symptoms tended to have greater peer difficulty relative to their stable low-symptomatic peers, even though they had "recovered" by age 6. For example, children with elevated anxiety symptoms at age 3 had the same level of difficulty with peer acceptance and aggression as children who had stable elevated anxiety from 3 to 6, *and* those who experienced later onset of anxiety at age 6. That is, all three groups of children with any history of anxiety were significantly more impaired than children with stable-low anxiety across childhood, and there was evidence that persisting anxiety is associated with high aggression. There was similar evidence for this pattern in the externalizing symptom interactions, with

"recovered" children who had a history of symptoms in preschool faring qualitatively worse across peer functioning domains relative to those with stable-low symptoms. Interestingly, children who had elevated ODD or ADHD symptoms at both time points had qualitatively *less* social discomfort than those with school-entry onset of symptoms. This suggested that children with longstanding externalizing symptoms may have learned to cope with them better over time. Overall, the pattern of homotypic interactions suggested that children with more proximal symptoms to middle-childhood (i.e., age 6) experienced greater difficulty with peer relationships three years later, although "recovered" children who had a history of preschool symptoms (internalizing *or* externalizing) were worse off than those with stable low symptoms.

We also observed a number of significant homotypic interactions when using the teacher-reported peer variables as the dependent variables. The pattern of interactions was less consistent within this subsample of participants, and did not follow the same pattern observed in the larger sample using factor scores. There were some instances of children with age 6 symptoms demonstrating significantly worse peer functioning relative to their peers, including in the ADHD models predicting overt aggression and exclusion by peers. However, there was no evidence of the lasting impact of preschool symptoms persisting into peer relationship functioning despite "recovery" by age 6 in any of the interactions. In fact, in two instances, children who had elevated symptoms in preschool but "recovered" by age 3 had significantly *less* peer problems at age 9; this was observed in the ODD model predicting relational aggression with peers, and in the depression model predicting exclusion by peers. One possible explanation is that children with early symptoms learned to manage their symptoms better, or perhaps acquired coping skills to use in peer interactions. The most interpretable and expected interaction within this set of analyses was that of depression predicting relational aggression, where we

observed that children who had elevated depression at age 6 were significantly more relationally aggressive if they also had experienced elevated depressive symptoms in preschool. However, because of the smaller sample size and mixed pattern of results, we were hesitant to over-interpret the findings based on teacher-reported peer functioning only.

Parental variables. Fourth, we examined the impact of parental poor global functioning and marital distress on child outcome. There were significant main effects for parental low global functioning scores *and* elevated marital dissatisfaction on each of the child peer functioning difficulty factor scores. These findings are consistent with the literature supporting that children whose parents have a history of psychiatric problems and/or marital dissatisfaction are at increased risk for poor outcomes themselves. This may be due to modeling influences (Bandura, 1977), spillover effects (Du Rocher Schudlich et al., 2004; Katz & Gottman, 1996), or genetic links between parent and child psychopathology.

Regarding interactions, we hypothesized that children with early-onset symptoms whose parents had poor global functioning or marital distress would be at greater risk for experiencing peer functioning difficulties at age 9. This finding was partially supported, and it was uniquely observed with children with elevated depressive symptoms. Specially, children who had elevated depressive symptoms in preschool *and* whose parents had either low global functioning scores *or* marital dissatisfaction were significantly more likely to have more difficulty with peer acceptance, aggression with peers (as measured by the aggression factor), and teacher-reported exclusion by peers. This again pointed to the clinical significance and validity of preschool-onset depressive symptoms, and the uniqueness of these symptoms in predicting negative outcomes. As expected, these results suggested that children who experienced depressive symptoms *and* who came from a difficult environment (i.e., low parental functioning; high marital

dissatisfaction) were at significantly greater risk for experiencing a bevy of peer problems six years later.

However, one interaction fit a different pattern. There was an interaction between age 3 depressive symptoms and parental GAF score predicting the aggression factor that showed no difference among aggression scores for children who had elevated depression at age 3, regardless of parental global assessment of functioning score. Instead, the significant difference lay among non-depressed children, with those who had low psychiatrically functioning mothers displaying significantly greater aggression than low-depressed children whose parents were high functioning. This suggests that having a low functioning parent is a general risk factor for children, regardless of the child's own psychopathology, and that parental functioning can have a negative effect on child functioning even when children are relatively symptom-free. In addition, these findings suggest that children of low-functioning parents have high levels of aggression regardless of child depression. As child depression increases, aggression was somewhat attenuated for children of low-functioning parents, which may be due to the effect of some depressive symptoms (e.g., withdrawal, anhedonia, lack of energy, or lack of confidence).

Gender effects. Last, we were interested in the impact of child sex on subsequent peer functioning difficulty. There were consistent main effects observed throughout analyses, with boys having significantly more peer difficulty across all three factors. Based on the current literature, we did not anticipate that males would display greater difficulty with social discomfort (anxiety, rejection, and low social support). However, if males were having significantly more problems with peer acceptance and aggression, perhaps it is not surprising that they felt rejected, minimally supported by peers, and more socially sensitive to peer feedback. This may have reflected a more general sample characteristic, albeit one that should be considered in

developmental research of this sort. It is possible that we did not observe greater social discomfort among girls because they were too young, given the evidence linking social discomfort to older adolescents (e.g., La Greca & Lopez, 1998). Relatedly, we had no a priori hypothesis about whether boys or girls would have more difficulty with peer acceptance, and it is interesting that boys demonstrated greater difficulty overall. Using teacher-only reports, we observed main effects for girls engaging in relational aggression, and boys displaying overt aggression, as one would expect based on prevalence of aggression subtypes across gender (Archer, 2004; Crick & Grotpeter, 1995).

Finally, we hypothesized that girls with early symptoms would be at greater risk for social discomfort, and early-onset symptomatic boys would be more aggressive than girls. However, we did not specify expected interactions between child sex and symptoms in predicting peer difficulties, given the exploratory nature of this question, and we did not observe any moderating influence of child sex and early-onset symptoms predicting peer difficulty.

Implications

Thus, our findings supported the validity of early-onset symptoms in young children. Specifically, preschool depressive, anxiety, and ODD symptoms predicted difficulty with peer acceptance and aggression six years later, even when accounting for concurrent symptoms. There were even stronger links between symptoms at school entry and peer functioning in middle-childhood, with depression, anxiety, ODD, and ADHD impacting peer domains beyond concurrent symptomatology. Moreover, our findings particularly underscored the importance of focusing on early-onset depressive symptoms, given the numerous unique associations between preschool-onset depressive symptoms and subsequent peer functioning difficulty. Interestingly, although depression and anxiety often co-occur, we did not observe the same predictive

relationships between early-onset anxiety and later peer difficulty that we did for depression. Previous research supports that preschool anxiety predicted socially unskilled behavior with peers at school entry (Danzig et al., 2013), but perhaps our findings here suggest that children with early anxiety learned to cope better socially in the few years following school entry. An alternative explanation is that preschool-onset depressive symptoms are rare and represent a more severe cluster of symptoms that is infrequently observed in children, but when present, has substantial predictive validity for later negative adjustment outcomes. Somewhat relatedly, it is also possible that depression in children is not interchangeable with adolescent/adult depression, but rather best understood as a cluster of symptoms is indicative of a more general at-risk status.

Strengths

This study had a number of strengths. First, we examined early-onset internalizing (depression; anxiety) and externalizing (ODD; ADHD) symptoms together to consider both bivariate and unique effects of differing forms of psychopathology. Second, we had multiple early-onset time points at which we evaluated symptomatology, such that we were able to compare the relative impact of preschool and school-entry symptoms on middle-childhood peer functioning. Third, the longitudinal design and relatively long-term follow-up period allowed us to robustly examine the effects of early symptoms that support their validity and clinical significance. This was key, given that nearly all research examining psychopathology and peer relationships in young children has been either cross-sectional or with very short follow-up periods. Fourth, our emphasis on middle-childhood peer functioning has been largely neglected in the field but is an important socioemotional development period for children that lays the groundwork for peer functioning skills prior to entering the turbulent adolescent years. Fifth, we included peer functioning data from multiple informants, including parents, teachers, and

children. Most previous research has not taken into account children's perceived peer functioning, despite their ability to self-report on experiences at this developmental age. Finally, most of the recent peer functioning literature has focused on peer victimization rather than broader domains of peer functioning, although the latter is relevant for a wider group of children and provides greater understanding of normative peer functioning domains in light of psychopathology.

Limitations

Despite its strengths, there were also many limitations in the current study. First, psychopathology was rated on the basis of parental report at both time points, which may not always accurately reflect child functioning, but there were currently no other validated alternatives to assessing psychopathology in preschoolers. Second, we used skip-outs for ADHD and ODD for the first part of the sample, so we may have missed some symptoms in children with low levels. Third, it was unfortunate that we did not have a larger teacher response rate to include teacher-reported peer functioning variables in the factor analysis; this would have simplified data analysis and reduced the number of analyses run. Fortunately, we did not observe systematic biases between children who had teacher-reported data and those who did not. Fourth, we did not have direct observation or peer-reported sociometric nominations for classroom functioning, as the latter is the gold standard in assessing peer relationship quality in children; however, including multiple informants helped reduce this bias. Fifth, we did not examine the comorbidity of symptoms in children, which may have shed more understanding on the unique effects that emerged. Sixth, we did not break down anxiety symptoms based on type (e.g., separation anxiety vs. generalized anxiety vs. specific phobia), which may have elucidated more specific effects within the broad anxiety domain. Seventh, we did not examine extensive peer

relationship functioning at earlier time points, and thus, we could not measure whether psychopathology impacted *change* in peer relationship functioning. Eighth, we neglected to collect information on whether child participants sought psychiatric treatment between the time points, which may have influenced their outcomes at age 6. Ninth, our effect sizes were small, which highlights the likely role of additional variables and necessity of exploring other processes that impact peer functioning difficulties in middle-childhood. Small effect sizes are typical in interaction analyses, however, as the main effects of the relevant variables have already been accounted for. Finally, participants were recruited using commercial mailing lists, which may have unknown biases, and the sample consisted of middle-class and relatively highly educated Caucasian individuals, although the sample reflected census data in the area.

Future Directions

Many of these limitations will be important to consider in future research. Certainly, an increased emphasis on examining preschool-onset depressive symptomatology is warranted, and a potentially fruitful area of future research given these findings. It will be important to consider what mechanisms or specific symptoms within the depression criteria placed these children at elevated interpersonal risk six years later. Further, conceptualizing children not as individuals with homotypic psychopathology, but as children with co-occuring clinical symptoms, would better elucidate mechanisms of risk for subgroups of children based on symptom grouping. Beyond the symptom level, there are certainly additional mediational and moderational variables at play that better explain the longitudinal associations between early-onset psychopathology and later peer functioning difficulty across multiple domains. Socially unskilled behavior explained much of the relationship between early externalizing symptoms and later peer problems, but this was not the case for children with internalizing symptoms. Given the links between early

depressive symptoms and later peer difficulty, better understanding what other mechanisms are operating would shed more light on these findings. It is possible that emotion dysregulation, theory of mind, shyness, or simply limited exposure to peers is driving these relationships, but there are likely other explanations as well. As related to this study, the mediation and moderation variables could have been treated differently, and will be important to further unpack in future research. For example, socially unskilled behavior could moderate the relationship between early symptoms and later peer functioning, as highly skilled behavior may operate as a buffer between symptoms and peer relationships. In addition, parental functioning variables (i.e., global assessment scores, marital dissatisfaction, psychopathology) may indirectly impact peer relationships through child symptoms as a mediator, which was something left unexamined in these data. Finally, our results supported that environmental variables, such as parental global functioning difficulty and marital dissatisfaction, could be particularly disruptive to interpersonal functioning development for psychiatrically at-risk children. Examining relative impact of other parental and environmental variables could further identify risk markers and elucidate areas for intervention.

In conclusion, this study added to the growing literature on the validity of early childhood psychopathology. Early identification of psychiatric symptoms in young children has been a source of debate, and researchers have been carefully carving the boundary line between normative and pathological behaviors in children for decades. Results from this study supported that early identification of symptoms of emotional and behavioral problems may contribute to mitigating their long-term negative impact on peer relationships in middle-childhood, as Carter and colleagues proposed (2004). The unique negative effects of early depressive symptoms on later peer functioning, persisting peer impairment that symptomatically "recovered" children

face, and interaction between environmental and psychiatric risk factors for depressed young children underscored the importance of early identification of early-onset symptoms. Indeed, early identification can lead to intervention for preschool children, as they are at increased risk for later peer functioning problems in middle-childhood.

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Table 1.

Means and standard deviations of study variables.

	Mean	SD
Age 3 PAPA symptoms		
Depression dimensional score	1.95	2.29
Anxiety dimensional score	7.72	6.56
ODD dimensional score	7.57	5.91
ADHD dimensional score	3.88	6.23
Age 6 PAPA symptoms		
Depression dimensional score	4.14	3.43
Anxiety dimensional score	11.14	8.92
ODD dimensional score	2.49	2.80
ADHD dimensional score	2.38	3.81
Age 6 peer variable		
Socially unskilled behavior (RCB)	6.12	2.06
Age 9 peer variables		
Parent-reported		
Peer acceptance at school (K-SADS)	1.56	.67
Peer acceptance in the neighborhood (K-SADS)	1.77	.74
Overall friendship quality (Kid-LIFE-RIFT)	1.38	.66
Overt aggression (CSBS-P)	4.41	1.13
Relational aggression (CSBS-P)	7.47	2.64
Child-reported		
Peer acceptance at school (K-SADS)	1.56	.67
Peer acceptance in the neighborhood (K-SADS)	1.77	.74

Overall friendship quality (Kid-LIFE-RIFT)	1.38	.66
Perceived rejection (SIS)	2.77	2.11
Perceived social support (APP)	67.61	6.33
Social anxiety (SASC)	3.29	2.47
Teacher-reported		
Overt aggression (CSBS-T)	4.26	1.02
Relational aggression (CSBS-T)	7.28	3.31
Exclusion by peers (CBS)	7.71	2.04
Age 9 KSADS symptoms		
Depression dimensional score	.28	.76
Anxiety dimensional score	2.51	2.97
ODD dimensional score	.55	1.17
ADHD dimensional score	1.23	1.77
Parent variables		
Global Assessment of Functioning (GAF)	80.80	8.63
Dyadic Adjustment Scale (DAS-7)	15.99	3.85

Note. PAPA: Preschool Age Psychiatric Assessment; ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder; RCB: Ratings of Children's Behaviors scale (parent report); K-SADS: Kiddie Schedule for the Affective Disorders and Schizophrenia; Kid-LIFE-RIFT: Longitudinal Interval Follow-up Evaluation Range of Impaired Functioning Tool Adapted for Children and Adolescents; CSBS-P: Children's Social Behavior Scale - Parent Version; SIS: Social Interaction Survey; APP: Social Support Appraisals Scale; SASC: Social Anxiety Scale for Children; CSBS-T: Children's Social Behavior Scale - Teacher Version; CBS: Child Behavior Scale

Table 2.

Exploratory factor analysis with all of the parent- and child-reported peer functioning variables in middle-childhood.

Variable	Social Discomfort	Low Acceptance	Aggression
Overt Aggression (SEQ)			.73
Relational Aggression (SEQ)			.62
Quality of Relations with Peers at School (K-SADS)		.69	
Quality of Relations with Peers in the Neighborhood (K-SADS)		.74	
Rating of Friendship Quality (LIFE-RIFT)		.36	
Perceived Social Rejection (SIS)	.60		
Peer Social Support (APP)	-.64		
Social Anxiety (SASC)	.56		

Table 3.

Bivariate associations between early-onset symptomatology and middle-childhood peer functioning factors.

	Factor 1 Social Discomfort	Factor 2 Low Acceptance	Factor 3 Aggression
Depression			
Preschool	.09[t]	.20***	.28***
School-Entry	.20***	.29***	.22***
Anxiety			
Preschool	.04	.14**	.17**
School-Entry	.09[t]	.17**	.17**
ODD			
Preschool	.11*	.17**	.23***
School-Entry	.21***	.33***	.31***
ADHD			
Preschool	.08	.16**	.15**
School-Entry	.16**	.26***	.20***

[t] $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 4.

Partial correlations between early-onset symptomatology and middle-childhood peer functioning factors, controlling for child sex and the corresponding middle-childhood symptom dimension.

	Factor 1 Social Discomfort	Factor 2 Low Acceptance	Factor 3 Aggression
Depression			
Preschool	.06	.17**	.26***
School-Entry	.16**	.24***	.18***
Anxiety			
Preschool	.01	.10*	.13*
School-Entry	.04	.11*	.11*
ODD			
Preschool	.02	.04	.12*
School-Entry	.13*	.23***	.20***
ADHD			
Preschool	-.06	.02	.04
School-Entry	.01	.10*	.07

[t] $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 5.

Multiple regression analyses between preschool symptoms and middle-childhood peer factors.

	Low Acceptance	B	SE	Beta	t-value
Child sex		-.22	.08	-.13	-2.88**
Preschool depression		.05	.02	.13	2.37**
Preschool anxiety		.01	.01	.05	0.88
Concurrent depression		.26	.05	.23	4.85***
Concurrent anxiety		.02	.01	.06	1.14
	Aggression	B	SE	Beta	t-value
Child sex		-.15	.07	-.10	-2.26*
Preschool depression		.05	.02	.16	2.56*
Preschool anxiety		.004	.01	.04	.74
Preschool ODD		.004	.01	.04	.65
Concurrent depression		.10	.05	.10	1.97*
Concurrent anxiety		.01	.01	.04	.87
Concurrent ODD		.09	.03	.15	2.68**

Note. ODD: Oppositional Defiant Disorder.

^{t} $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 6.

Bivariate associations between early-onset symptomatology and middle-childhood teacher-reported peer functioning.

	Overt Aggression	Relational Aggression	Excluded by Peers
Depression			
Preschool	.02	.16**	.09
School-Entry	.05	.13*	.24***
Anxiety			
Preschool	.03	-.03	-.05
School-Entry	-.01	.00	.07
ODD			
Preschool	.13*	.11^{t}	.06
School-Entry	.07	.20**	.18**
ADHD			
Preschool	.04	.08	.08
School-Entry	.10^{t}	.30***	.26***

^{t} $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 7.

Partial correlations between early-onset symptomatology and middle-childhood teacher-reported peer functioning, controlling for child sex and homotypic symptomatology in middle childhood.

	Overt Aggression	Relational Aggression	Excluded by Peers
Depression			
Preschool	.01	.16**	.06
School-Entry	.06	.12*	.20***
Anxiety			
Preschool	.04	-.04	-.07
School-Entry	-.01	-.01	.04
ODD			
Preschool	.14*	.02	-.02
School-Entry	.09	.08	.11[t]
ADHD			
Preschool	.01	.02	-.05
School-Entry	.09	.21***	.11[t]

[t] $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 8.

Multiple regression analyses between school-entry symptoms and middle-childhood peer factors.

Social Discomfort	B	SE	Beta	t-value
Child sex	-.24	.08	-.15	-3.14**
School-entry depression	.02	.01	.10	1.80[t]
School-entry ODD	.03	.02	.11	1.71[t]
Concurrent depression	.16	.06	.14	2.67**
Concurrent ODD	.01	.04	.02	.32

Low Acceptance	B	SE	Beta	t-value
Child sex	-.14	.08	-.09	-1.87[t]
School-entry depression	.02	.02	.08	1.24
School-entry anxiety	-.001	.01	-.01	-.10
School-entry ODD	.05	.02	.18	2.99**
School-entry ADHD	-.003	.01	-.01	-.22
Concurrent depression	.17	.06	.15	3.06**
Concurrent anxiety	.01	.01	.05	.94
Concurrent ODD	.01	.04	.01	.16
Concurrent ADHD	.11	.03	.23	4.26***

Aggression	B	SE	Beta	t-value
Child sex	-.15	.07	-.10	-2.15*
School-entry depression	-.002	.01	-.01	-.13
School-entry anxiety	.01	.01	.07	1.10
School-entry ODD	.05	.02	.21	3.36***
Concurrent depression	.09	.05	.09	1.73[t]
Concurrent anxiety	.02	.01	.06	1.27
Concurrent ODD	.07	.04	.11	1.92[t]

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention-Deficit/Hyperactivity Disorder.

[t] $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 9.

Multiple regression analysis between school-entry symptoms and middle-childhood teacher-reported relational aggression.

Relational aggression	B	SE	Beta	t-value
Child sex	.94	.37	.15	2.55**
School-entry depression	-.005	.06	-.005	-.08
School-entry ADHD	.20	.06	.24	3.39***
Concurrent depression	.10	.25	.02	.40
Concurrent ADHD	.25	.13	.13	1.92[t]

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention-Deficit/Hyperactivity Disorder.

[t] $p < .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 10.

Multiple regression analyses, including interactions, between age 3 and 6 symptoms and middle-childhood peer factors.

Social Discomfort

	B	B(SE)	β
Depression Model			
Child sex	-.26	.08	-.16***
Age 3 depression symptoms	-.01	.02	-.02
Age 6 depression symptoms	.05	.01	.21***
Age 3 X age 6 depression symptoms	-.01	.01	-.09
Anxiety Model			
Child sex	-.25	.08	-.15**
Age 3 anxiety symptoms	-.001	.01	-.01
Age 6 anxiety symptoms	.01	.01	.08
Age 3 X age 6 anxiety symptoms	-.001	.001	-.07
ODD Model			
Child sex	-.24	.08	-.15**
Age 3 ODD symptoms	-.001	.01	-.01
Age 6 ODD symptoms	.06	.02	.21***
Age 3 X age 6 ODD symptoms	-.004	.002	-.13*
ADHD Model			
Child sex	-.25	.08	-.16***
Age 3 ADHD symptoms	-.01	.01	-.05

Age 6 ADHD symptoms	.04	.01	.18**
Age 3 X age 6 ADHD symptoms	-.002	.001	-.17*

Low Acceptance

	B	B(SE)	β
Depression Model			
Child sex	-.25	.08	-.15***
Age 3 depression symptoms	.03	.02	.09[t]
Age 6 depression symptoms	.06	.01	.25***
Age 3 X age 6 depression symptoms	.00	.01	-.01
Anxiety Model			
Child sex	-.23	.08	-.14**
Age 3 anxiety symptoms	.01	.01	.08
Age 6 anxiety symptoms	.01	.01	.11*
Age 3 X age 6 anxiety symptoms	-.002	.001	-.19***
ODD Model			
Child sex	-.22	.08	-.14**
Age 3 ODD symptoms	.00	.01	.03
Age 6 ODD symptoms	.09	.02	.32***
Age 3 X age 6 ODD symptoms	-.003	.002	-.08
ADHD Model			
Child sex	-.23	.08	-.14**
Age 3 ADHD symptoms	.00	.01	.003
Age 6 ADHD symptoms	.05	.01	.25***
Age 3 X age 6 ADHD symptoms	-.002	.001	-.18**

Aggression

	B	B(SE)	β
Depression Model			
Child sex	-.17	.07	-.12**
Age 3 depression symptoms	.07	.02	.22***
Age 6 depression symptoms	.02	.01	.12*
Age 3 X age 6 depression symptoms	-.004	.004	-.04
Anxiety Model			
Child sex	-.18	.07	-.12**
Age 3 anxiety symptoms	.02	.01	.11*
Age 6 anxiety symptoms	.01	.01	.10[t]
Age 3 X age 6 anxiety symptoms	-.001	.00	-.12*
ODD Model			
Child sex	-.15	.07	-.11*
Age 3 ODD symptoms	.01	.01	.09[t]
Age 6 ODD symptoms	.07	.01	.26***
Age 3 X age 6 ODD symptoms	-.004	.002	-.13*
ADHD Model			
Child sex	-.17	.07	-.12*
Age 3 ADHD symptoms	.01	.01	.04
Age 6 ADHD symptoms	.03	.01	.17**
Age 3 X age 6 ADHD symptoms	-.001	.001	-.13*

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 11.

Multiple regression analyses, including interactions, between age 3 and 6 symptoms and middle-childhood teacher-reported peer functioning variables.

Overt aggression

	B	B(SE)	β
Depression Model			
Child sex	-.24	.12	-.12*
Age 3 depression symptoms	-.03	.03	-.06
Age 6 depression symptoms	.02	.02	.08
Age 3 X age 6 depression symptoms	.004	.01	.04
Anxiety Model			
Child sex	-.23	.12	-.12^{t}
Age 3 anxiety symptoms	.01	.01	.04
Age 6 anxiety symptoms	-.01	.01	-.05
Age 3 X age 6 anxiety symptoms	-.001	.001	-.05
ODD Model			
Child sex	-.20	.12	-.10^{t}
Age 3 ODD symptoms	.01	.01	.07
Age 6 ODD symptoms	.01	.03	.03
Age 3 X age 6 ODD symptoms	-.001	.003	-.02
ADHD Model			
Child sex	-.24	.12	-.12*
Age 3 ADHD symptoms	-.007	.01	-.04

Age 6 ADHD symptoms	.03	.02	.13[t]
Age 3 X age 6 ADHD symptoms	-.002	.001	-.17*

Relational Aggression

	B	B(SE)	β
Depression Model			
Child sex	.81	.38	.13*
Age 3 depression symptoms	.18	.09	.13*
Age 6 depression symptoms	.07	.06	.07
Age 3 X age 6 depression symptoms	.06	.02	.19**
Anxiety Model			
Child sex	.76	.39	.12*
Age 3 anxiety symptoms	-.01	.03	-.03
Age 6 anxiety symptoms	.01	.03	.02
Age 3 X age 6 anxiety symptoms	.002	.003	.04
ODD Model			
Child sex	.84	.39	.13*
Age 3 ODD symptoms	.01	.04	.03
Age 6 ODD symptoms	.22	.08	.19**
Age 3 X age 6 ODD symptoms	.02	.01	.15*
ADHD Model			
Child sex	.66	.38	.10[t]
Age 3 ADHD symptoms	-.06	.04	-.11
Age 6 ADHD symptoms	.31	.06	.37***
Age 3 X age 6 ADHD symptoms	.01	.003	.14

Excluded by Peers

	B	B(SE)	β
Depression Model			
Child sex	-.20	.25	-.04
Age 3 depression symptoms	-.03	.06	-.03
Age 6 depression symptoms	.16	.04	.26***
Age 3 X age 6 depression symptoms	.05	.02	.23***
Anxiety Model			
Child sex	-.18	.25	-.04
Age 3 anxiety symptoms	-.04	.02	-.12
Age 6 anxiety symptoms	.03	.02	.13^{t}
Age 3 X age 6 anxiety symptoms	.00	.002	.001
ODD Model			
Child sex	-.19	.25	-.04
Age 3 ODD symptoms	-.01	.03	-.04
Age 6 ODD symptoms	.15	.05	.20**
Age 3 X age 6 ODD symptoms	.01	.01	.08
ADHD Model			
Child sex	-.27	.25	-.07
Age 3 ADHD symptoms	-.04	.03	-.13^{t}
Age 6 ADHD symptoms	.18	.04	.33***
Age 3 X age 6 ADHD symptoms	-.01	.002	-.22*

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 12.

Multiple regression analyses, including interactions, for age 3 symptoms and parental global assessment of functioning (GAF) scores predicting middle-childhood peer factors.

Social Discomfort

	B	B(SE)	β
Depression Model			
Child sex	-.26	.08	-.16***
Age 3 depression symptoms	.02	.02	.05
Parental GAF	-.01	.01	-.10[t]
Age 3 depression symptoms X GAF	.001	.002	.02
Anxiety Model			
Child sex	-.27	.08	-.17***
Age 3 anxiety symptoms	.00	.01	.00
Parental GAF	-.01	.01	-.11*
Age 3 anxiety symptoms X GAF	.00	.001	.01
ODD Model			
Child sex	-.26	.08	-.16***
Age 3 ODD symptoms	.01	.01	.06
Parental GAF	-.01	.01	-.10*
Age 3 ODD symptoms X GAF	.001	.001	.08
ADHD Model			
Child sex	-.26	.08	-.16***
Age 3 ADHD symptoms	.004	.01	.03

Parental GAF	-.01	.01	-.11*
Age 3 ADHD symptoms X GAF	.001	.001	.04

Low Acceptance

	B	B(SE)	β
Depression Model			
Child sex	-.24	.08	-.15**
Age 3 depression symptoms	.05	.02	.15**
Parental GAF	-.02	.01	-.17***
Age 3 depression symptoms X GAF	-.004	.002	-.10*
Anxiety Model			
Child sex	-.25	.08	-.15***
Age 3 anxiety symptoms	.01	.01	.08
Parental GAF	-.02	.01	-.19***
Age 3 anxiety symptoms X GAF	.00	.001	.03
ODD Model			
Child sex	-.24	.08	-.15**
Age 3 ODD symptoms	.01	.01	.10*
Parental GAF	-.02	.01	-.19***
Age 3 ODD symptoms X GAF	.00	.001	.03
ADHD Model			
Child sex	-.23	.08	-.14**
Age 3 ADHD symptoms	.02	.01	.12*
Parental GAF	-.02	.004	-.20***
Age 3 ADHD symptoms X GAF	.00	.001	-.02

Aggression

	B	B(SE)	β
Depression Model			
Child sex	-.19	.07	-.13**
Age 3 depression symptoms	.07	.02	.22***
Parental GAF	-.02	.004	-.20***
Age 3 depression symptoms X GAF	-.01	.002	-.15**
Anxiety Model			
Child sex	-.20	.07	-.14**
Age 3 anxiety symptoms	.01	.01	.09^{t}
Parental GAF	-.02	.004	-.24***
Age 3 anxiety symptoms X GAF	.001	.001	.06
ODD Model			
Child sex	-.18	.07	-.13**
Age 3 ODD symptoms	.02	.01	.16***
Parental GAF	-.02	.004	-.22***
Age 3 ODD symptoms X GAF	.001	.001	.05
ADHD Model			
Child sex	-.19	.07	-.13**
Age 3 ADHD symptoms	.01	.01	.10*
Parental GAF	-.02	.004	-.25***
Age 3 ADHD symptoms X GAF	.001	.001	.06

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 13.

Multiple regression analyses, including interactions, for age 3 symptoms and parental global assessment of functioning (GAF) scores predicting middle-childhood teacher-reported peer functioning variables.

Overt aggression

	B	B(SE)	β
Depression Model			
Child sex	-.27	.12	-.13*
Age 3 depression symptoms	.002	.03	.004
Parental GAF	-.001	.01	-.01
Age 3 depression symptoms X GAF	-.01	.003	-.10
Anxiety Model			
Child sex	-.26	.12	-.13*
Age 3 anxiety symptoms	.002	.01	.02
Parental GAF	-.001	.01	-.01
Age 3 anxiety symptoms X GAF	.00	.001	.03
ODD Model			
Child sex	-.22	.13	-.11^{t}
Age 3 ODD symptoms	.02	.01	.12*
Parental GAF	.002	.01	.02
Age 3 ODD symptoms X GAF	.00	.001	-.01
ADHD Model			
Child sex	-.26	.13	-.13*
Age 3 ADHD symptoms	.003	.01	.02

Parental GAF	-.001	.01	-.01
Age 3 ADHD symptoms X GAF	.00	.001	.00

Relational Aggression

	B	B(SE)	β
Depression Model			
Child sex	.77	.40	.12*
Age 3 depression symptoms	.26	.09	.18**
Parental GAF	.004	.02	.01
Age 3 depression symptoms X GAF	-.01	.01	-.03
Anxiety Model			
Child sex	.61	.40	.09
Age 3 anxiety symptoms	-.02	.03	-.04
Parental GAF	-.02	.02	-.06
Age 3 anxiety symptoms X GAF	.004	.003	.09
ODD Model			
Child sex	.79	.40	.12*
Age 3 ODD symptoms	.07	.04	.12*
Parental GAF	-.01	.02	-.02
Age 3 ODD symptoms X GAF	-.004	.003	-.07
ADHD Model			
Child sex	.76	.40	.11[t]
Age 3 ADHD symptoms	.05	.03	.10
Parental GAF	-.01	.02	-.03
Age 3 ADHD symptoms X GAF	-.001	.004	-.02

Excluded by Peers

	B	B(SE)	β
Depression Model			
Child sex	-.21	.25	-.05
Age 3 depression symptoms	.05	.06	.06
Parental GAF	-.02	.02	-.08
Age 3 depression symptoms X GAF	-.01	.01	-.05
Anxiety Model			
Child sex	-.27	.25	-.07
Age 3 anxiety symptoms	-.03	.02	-.09
Parental GAF	-.03	.02	-.13*
Age 3 anxiety symptoms X GAF	.004	.002	.12[t]
ODD Model			
Child sex	-.21	.25	-.05
Age 3 ODD symptoms	.01	.02	.04
Parental GAF	-.02	.02	-.09
Age 3 ODD symptoms X GAF	-.003	.002	-.09
ADHD Model			
Child sex	-.19	.25	-.05
Age 3 ADHD symptoms	.02	.02	.05
Parental GAF	-.02	.01	-.09
Age 3 ADHD symptoms X GAF	-.004	.003	-.10

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 14.

Multiple regression analyses, including interactions, for age 3 symptoms and parental dyadic adjustment (DAS) scores predicting middle-childhood peer factors.

Social Discomfort

	B	B(SE)	β
Depression Model			
Child sex	-.21	.08	-.14**
Age 3 depression symptoms	.03	.02	.08
Parental DAS	-.05	.01	-.23***
Age 3 depression symptoms X DAS	-.002	.01	-.03
Anxiety Model			
Child sex	-.22	.08	-.14**
Age 3 anxiety symptoms	.003	.01	.03
Parental DAS	-.05	.01	-.24***
Age 3 anxiety symptoms X DAS	.00	.002	-.002
ODD Model			
Child sex	-.20	.08	-.13**
Age 3 ODD symptoms	.01	.01	.07
Parental DAS	-.05	.01	-.23***
Age 3 ODD symptoms X DAS	.002	.002	.04
ADHD Model			
Child sex	-.21	.08	-.14**
Age 3 ADHD symptoms	.004	.01	.03

Parental DAS	-.05	.01	-.24***
Age 3 ADHD symptoms X DAS	-.002	.002	-.07

Low Acceptance

	B	B(SE)	β
Depression Model			
Child sex	-.19	.08	-.12*
Age 3 depression symptoms	.06	.02	.18***
Parental DAS	-.07	.01	-.33***
Age 3 depression symptoms X DAS	-.01	.01	-.09[t]
Anxiety Model			
Child sex	-.19	.08	-.12*
Age 3 anxiety symptoms	.01	.01	.11*
Parental DAS	-.08	.01	-.35***
Age 3 anxiety symptoms X DAS	-.001	.002	-.02
ODD Model			
Child sex	-.18	.08	-.11*
Age 3 ODD symptoms	.02	.01	.12*
Parental DAS	-.08	.01	-.35***
Age 3 ODD symptoms X DAS	.00	.002	-.01
ADHD Model			
Child sex	-.17	.08	-.11*
Age 3 ADHD symptoms	.02	.01	.12*
Parental DAS	-.08	.01	-.35***
Age 3 ADHD symptoms X DAS	-.001	.002	-.04

Aggression

	B	B(SE)	β
Depression Model			
Child sex	-.19	.07	-.13**
Age 3 depression symptoms	.09	.02	.27***
Parental DAS	-.04	.01	-.21***
Age 3 depression symptoms X DAS	-.01	.004	-.12*
Anxiety Model			
Child sex	-.20	.07	-.14**
Age 3 anxiety symptoms	.02	.01	.16***
Parental DAS	-.04	.01	-.23***
Age 3 anxiety symptoms X DAS	.001	.001	.04
ODD Model			
Child sex	-.17	.07	-.12*
Age 3 ODD symptoms	.03	.01	.25***
Parental DAS	-.04	.01	-.22***
Age 3 ODD symptoms X DAS	.00	.002	-.001
ADHD Model			
Child sex	-.18	.07	-.13**
Age 3 ADHD symptoms	.02	.01	.14**
Parental DAS	-.04	.01	-.23***
Age 3 ADHD symptoms X DAS	.001	.001	.03

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 15.

Multiple regression analyses, including interactions, for age 3 symptoms and parental dyadic adjustment (DAS) scores predicting middle-childhood teacher-reported peer functioning variables.

Overt aggression

	B	B(SE)	β
Depression Model			
Child sex	-.24	.14	-.11[t]
Age 3 depression symptoms	.01	.03	.02
Parental DAS	.01	.02	.04
Age 3 depression symptoms X DAS	.001	.01	.01
Anxiety Model			
Child sex	-.24	.14	-.11[t]
Age 3 anxiety symptoms	.01	.01	.04
Parental DAS	.01	.02	.04
Age 3 anxiety symptoms X DAS	.001	.002	.03
ODD Model			
Child sex	-.19	.14	-.09
Age 3 ODD symptoms	.03	.01	.14*
Parental DAS	.01	.02	.04
Age 3 ODD symptoms X DAS	.003	.003	.05
ADHD Model			
Child sex	-.23	.14	-.11[t]

Age 3 ADHD symptoms	.01	.01	.04
Parental DAS	.01	.02	.04
Age 3 ADHD symptoms X DAS	.002	.003	.05

Relational Aggression

	B	B(SE)	β
Depression Model			
Child sex	.83	.38	.14*
Age 3 depression symptoms	.27	.08	.21***
Parental DAS	.02	.05	.02
Age 3 depression symptoms X DAS	-.01	.02	-.02
Anxiety Model			
Child sex	.69	.38	.12[t]
Age 3 anxiety symptoms	-.001	.03	-.002
Parental DAS	-.01	.05	-.01
Age 3 anxiety symptoms X DAS	.00	.01	.00
ODD Model			
Child sex	.86	.39	.14*
Age 3 ODD symptoms	.07	.03	.13*
Parental DAS	.002	.05	.002
Age 3 ODD symptoms X DAS	-.01	.01	-.05
ADHD Model			
Child sex	.74	.39	.12[t]
Age 3 ADHD symptoms	.02	.03	.03
Parental DAS	-.003	.05	-.004

Age 3 ADHD symptoms X DAS	-.01	.01	-.05

Excluded by Peers

	B	B(SE)	β
Depression Model			
Child sex	-.04	.25	-.01
Age 3 depression symptoms	.10	.05	.12[t]
Parental DAS	-.08	.03	-.16**
Age 3 depression symptoms X DAS	-.03	.02	-.14*
Anxiety Model			
Child sex	-.10	.25	-.03
Age 3 anxiety symptoms	-.01	.02	-.03
Parental DAS	-.09	.03	-.18**
Age 3 anxiety symptoms X DAS	-.001	.004	-.02
ODD Model			
Child sex	-.03	.25	-.01
Age 3 ODD symptoms	.02	.02	.07
Parental DAS	-.09	.03	-.17**
Age 3 ODD symptoms X DAS	-.004	.01	-.04
ADHD Model			
Child sex	-.01	.25	-.003
Age 3 ADHD symptoms	.03	.02	.09
Parental DAS	-.09	.03	-.17**
Age 3 ADHD symptoms X DAS	.001	.01	.02

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 16.

Multiple regression analyses, including interactions, for age 3 symptoms and child sex predicting middle-childhood peer factors.

Social Discomfort

	B	B(SE)	β
Depression Model			
Child sex	-.25	.08	-.16***
Age 3 depression symptoms	.03	.02	.08[t]
Child sex X age 3 depression symptoms	.03	.04	.05
Anxiety Model			
Child sex	-.26	.08	-.16***
Age 3 anxiety symptoms	.004	.01	.03
Child sex X age 3 anxiety symptoms	.01	.01	.06
ODD Model			
Child sex	-.24	.08	-.15**
Age 3 ODD symptoms	.01	.01	.09[t]
Child sex X age 3 ODD symptoms	.02	.01	.08
ADHD Model			
Child sex	-.25	.08	-.16***
Age 3 ADHD symptoms	.01	.01	.05
Child sex X age 3 ADHD symptoms	.001	.01	.003

Low Acceptance

	B	B(SE)	β
Depression Model			
Child sex	-.23	.08	-.14**
Age 3 depression symptoms	.07	.02	.19***
Child sex X age 3 depression symptoms	.04	.04	.07
Anxiety Model			
Child sex	-.23	.08	-.14**
Age 3 anxiety symptoms	.02	.01	.13**
Child sex X age 3 anxiety symptoms	-.003	.01	-.01
ODD Model			
Child sex	-.22	.08	-.14**
Age 3 ODD symptoms	.02	.01	.15**
Child sex X age 3 ODD symptoms	.01	.01	.07
ADHD Model			
Child sex	-.21	.08	-.13**
Age 3 ADHD symptoms	.02	.01	.14**
Child sex X age 3 ADHD symptoms	.01	.01	.03

Aggression

	B	B(SE)	β
Depression Model			
Child sex	-.17	.07	-.12**
Age 3 depression symptoms	.09	.02	.27***
Child sex X age 3 depression symptoms	-.02	.03	-.04
Anxiety Model			
Child sex	-.18	.07	-.12**

Age 3 anxiety symptoms	.02	.01	.16***
Child sex X age 3 anxiety symptoms	-.01	.01	-.07
ODD Model			
Child sex	-.16	.07	-.11*
Age 3 ODD symptoms	.03	.01	.22***
Child sex X age 3 ODD symptoms	-.004	.01	-.02
ADHD Model			
Child sex	-.16	.07	-.11*
Age 3 ADHD symptoms	.02	.01	.13**
Child sex X age 3 ADHD symptoms	-.002	.01	-.01

Note. ODD: Oppositional Defiant Disorder; ADHD: Attention Deficit/Hyperactivity Disorder.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Figure 1.

Initial mediation model between age 3 symptoms and age 9 peer functioning, including child sex as a covariate, and with age 6 socially unskilled behavior as the mediator. Error terms on endogenous variables not depicted for visual clarity.

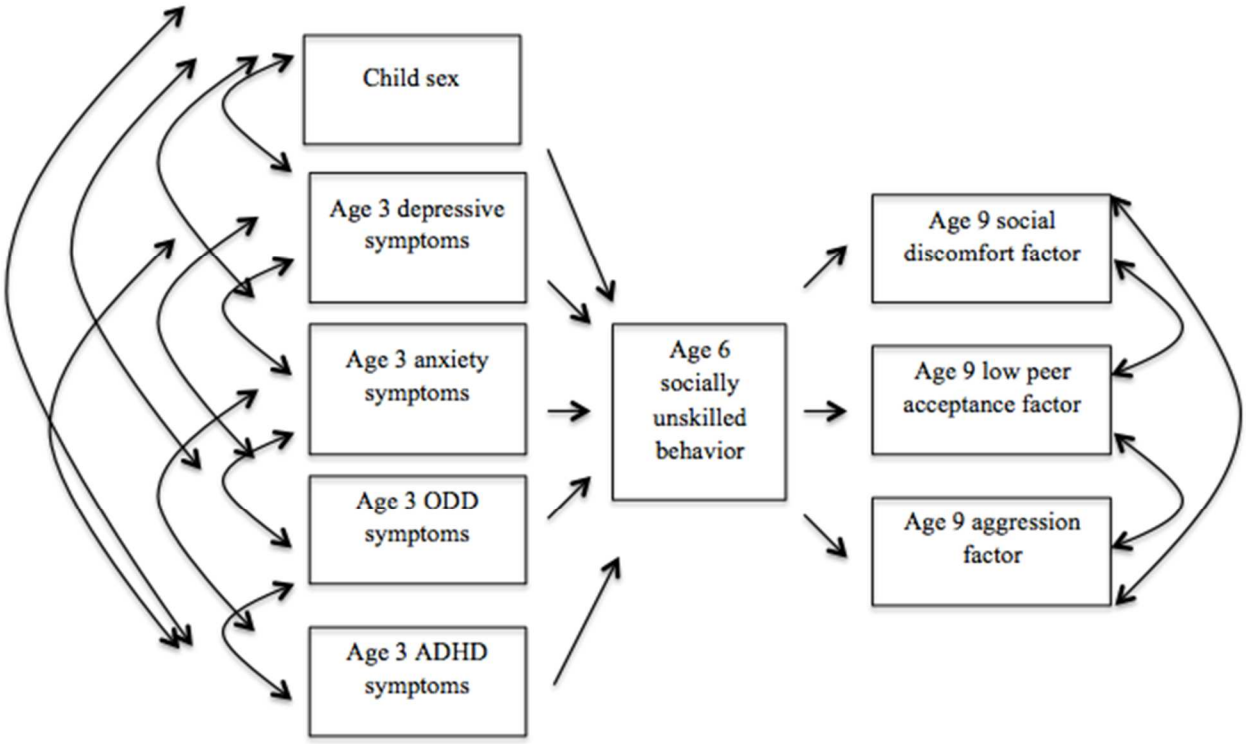

Figure 2.

Final mediation model between age 3 symptoms and age 9 peer functioning, including child sex as a covariate, and with age 6 socially unskilled behavior as the mediator. Error terms on endogenous variables not depicted for visual clarity. Double-headed arrows between variables refer to correlations between error terms of those variables. 95% CIs are presented in text.

^{t} $p \leq .10$; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

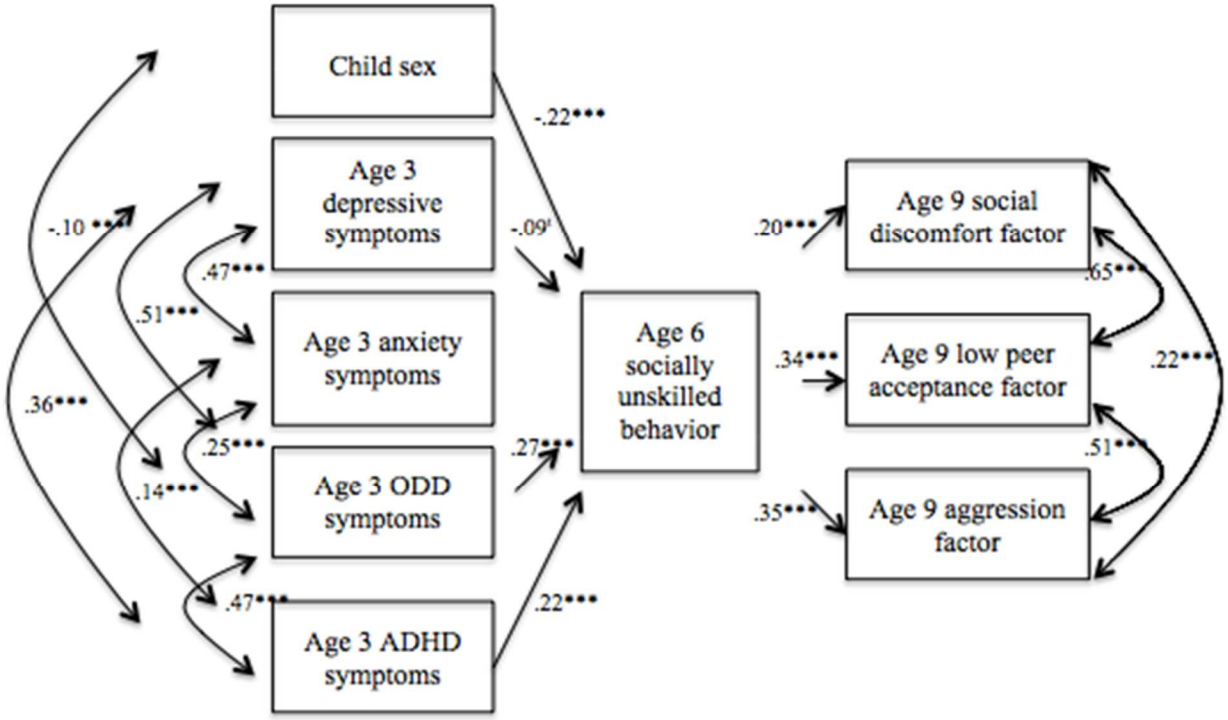

Figure 3.

Interaction between age 3 ODD and age 6 ODD in predicting elevated social discomfort with peers in middle childhood.

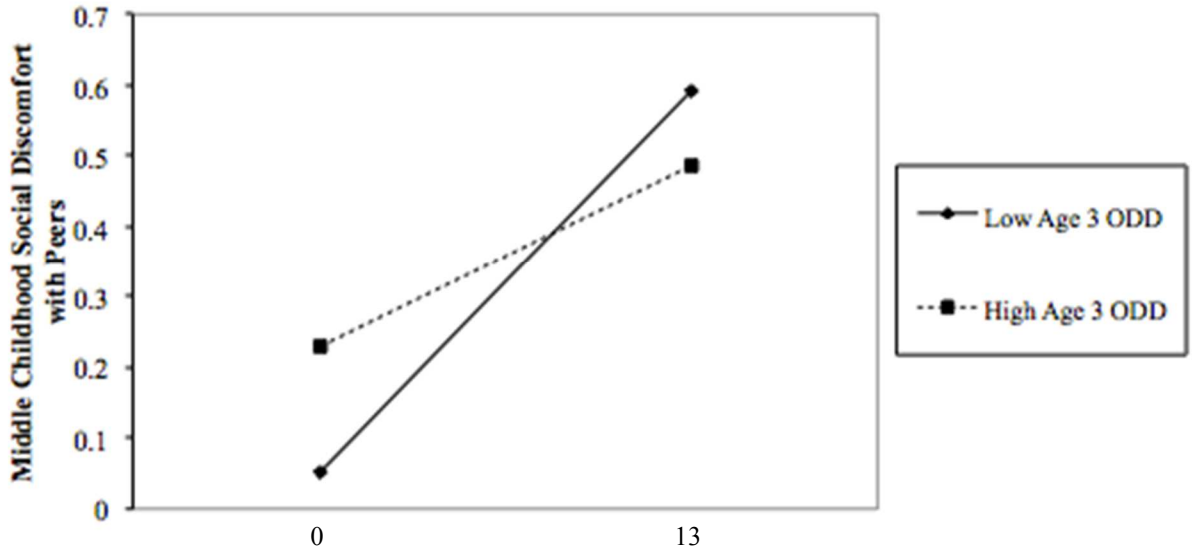

Figure 4.

Interaction between age 3 ADHD and age 6 ADHD in predicting elevated social discomfort with peers in middle childhood.

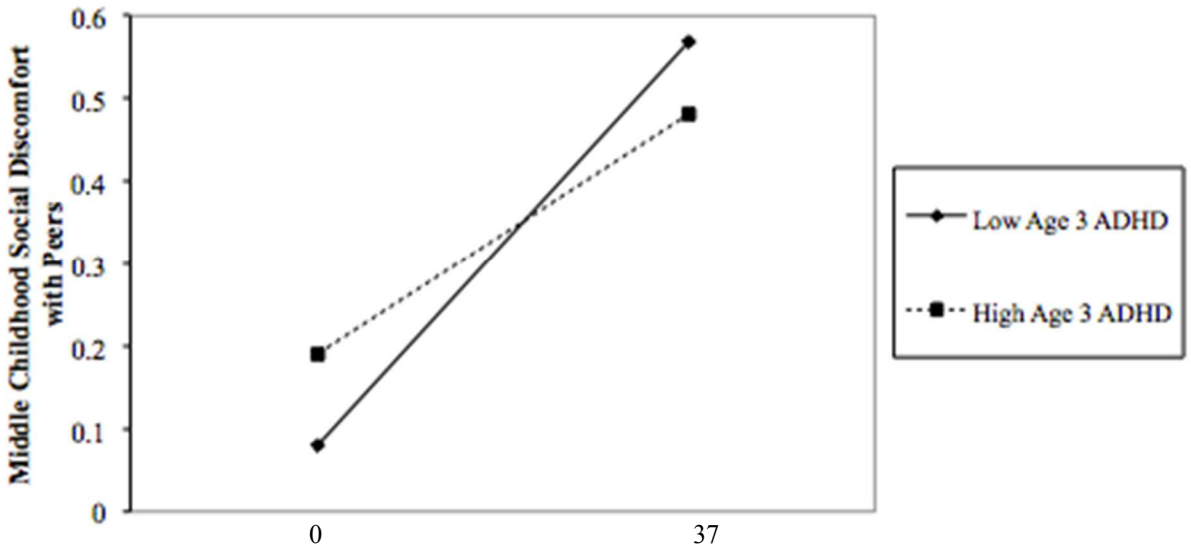

Figure 5.

Interaction between age 3 anxiety and age 6 anxiety in predicting elevated difficulty in peer acceptance at age 9.

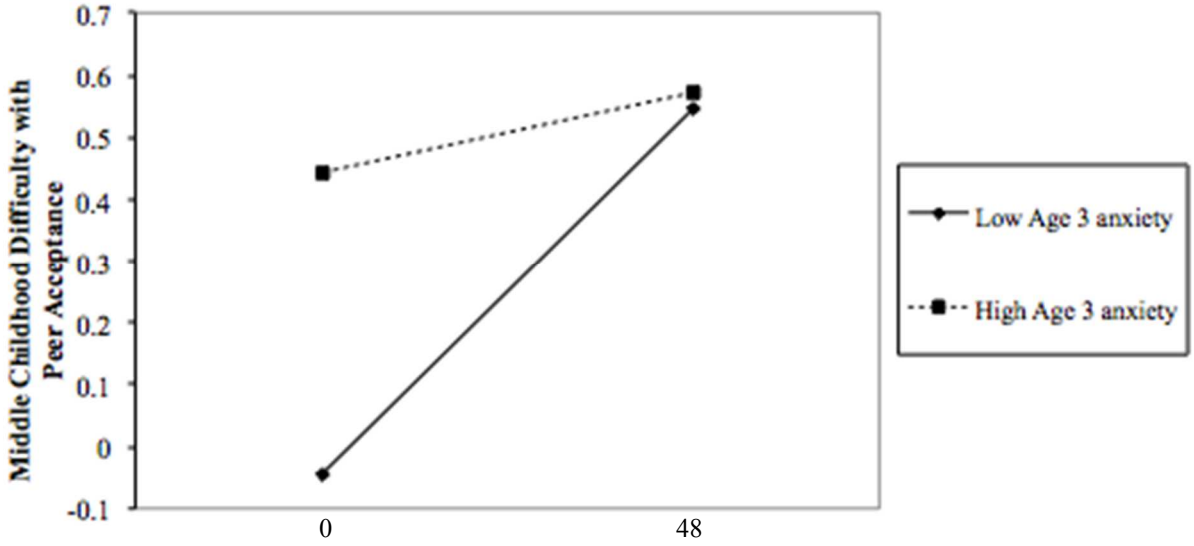

Figure 6.

Interaction between age 3 ADHD and age 6 ADHD in predicting elevated difficulty in peer acceptance at age 9.

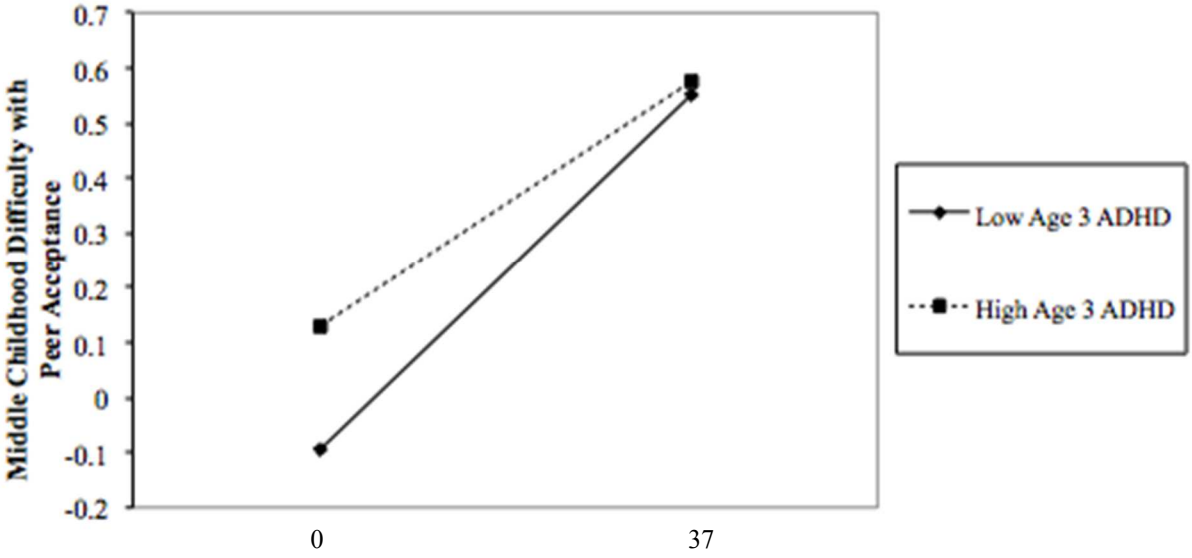

Figure 7.

Interaction between age 3 anxiety and age 6 anxiety in predicting aggression with peers at age 9.

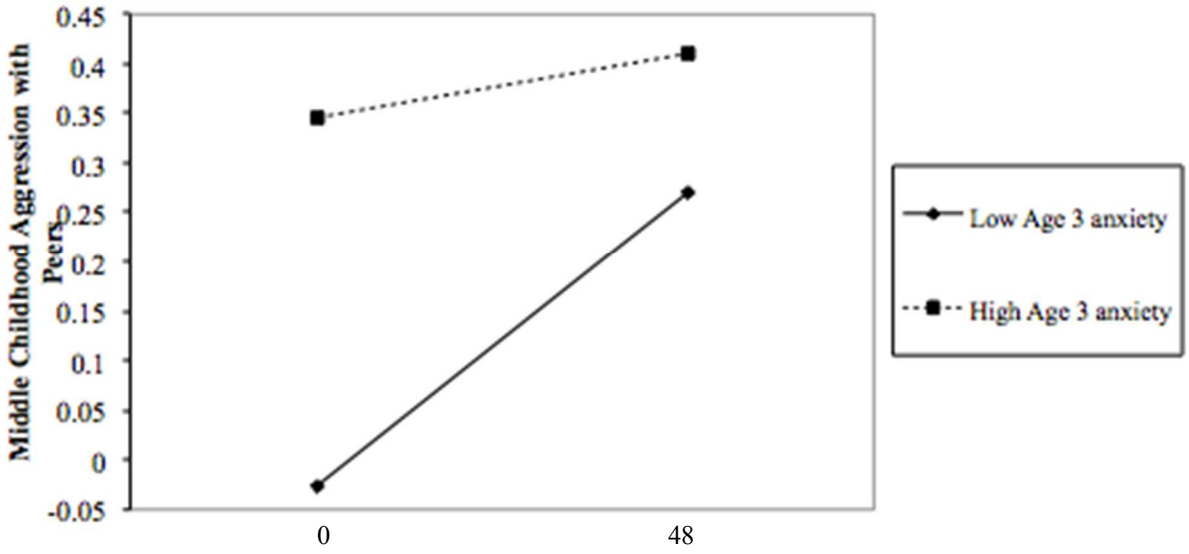

Figure 8.

Interaction between age 3 ODD and age 6 ODD in predicting aggression with peers at age 9.

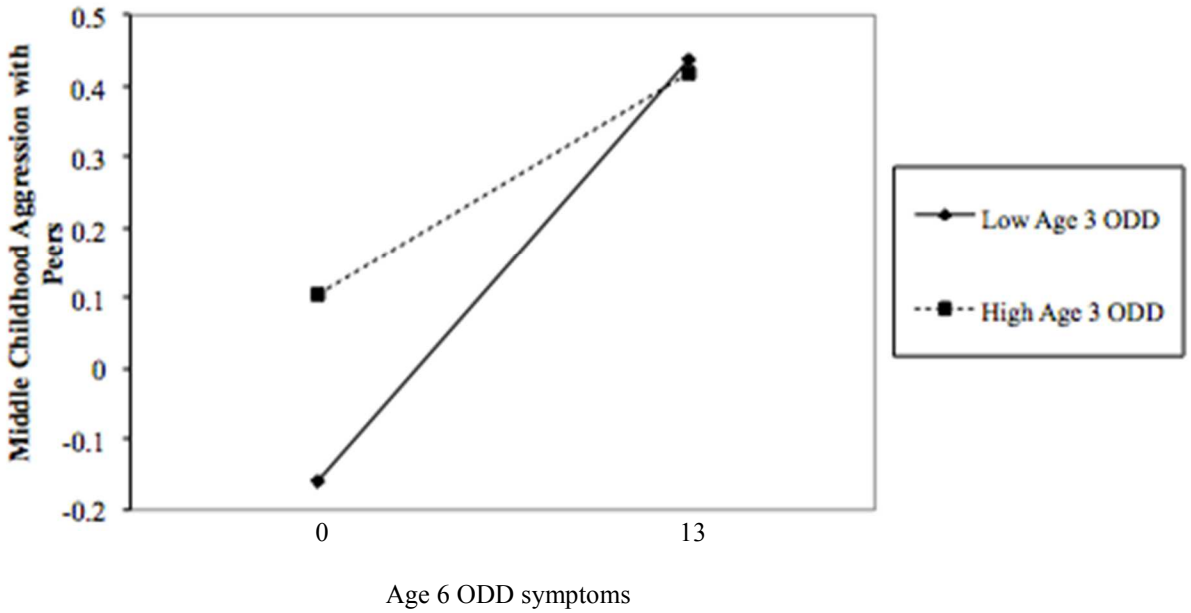

Figure 9.

Interaction between age 3 ADHD and age 6 ADHD in predicting aggression with peers at age 9.

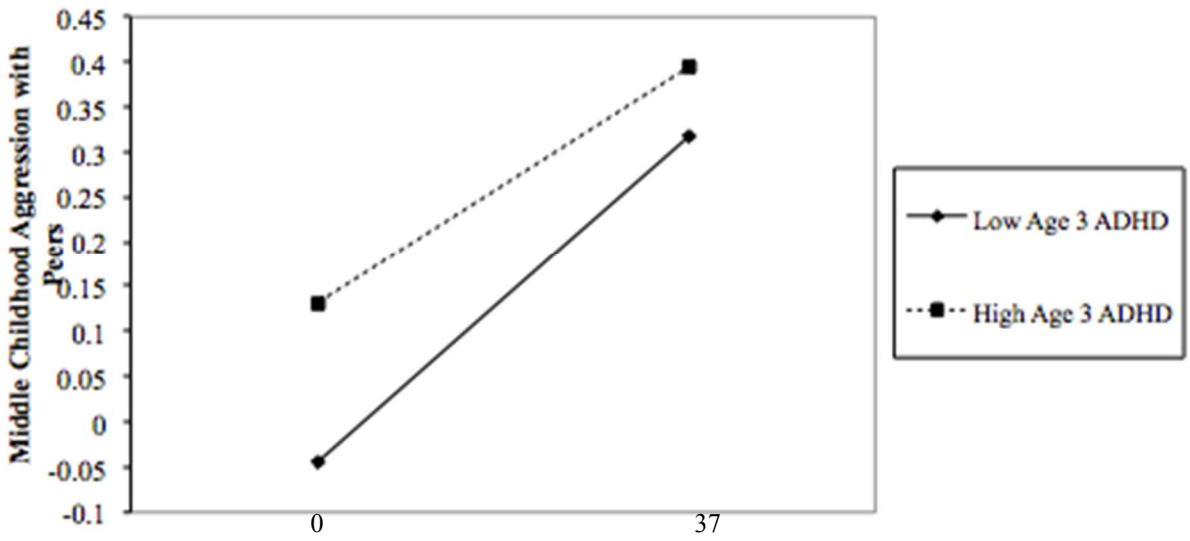

Figure 10.

Interaction between age 3 ADHD and age 6 ADHD in predicting teacher-reported overt aggression with peers at age 9.

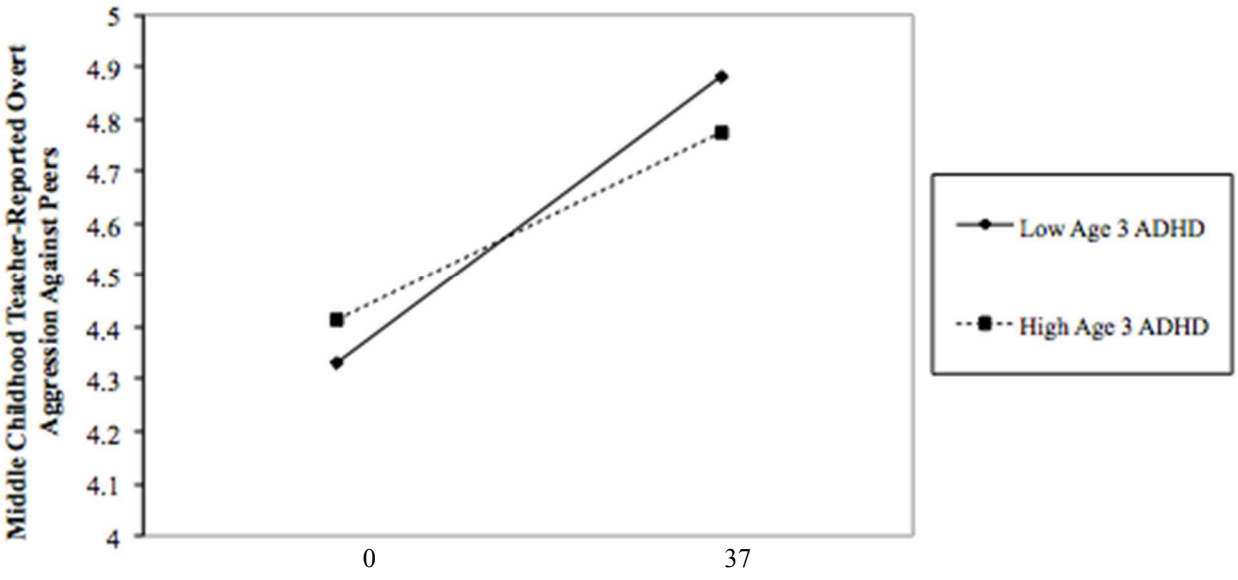

Figure 11.

Interaction between age 3 depression and age 6 depression in predicting teacher-reported relational aggression with peers at age 9.

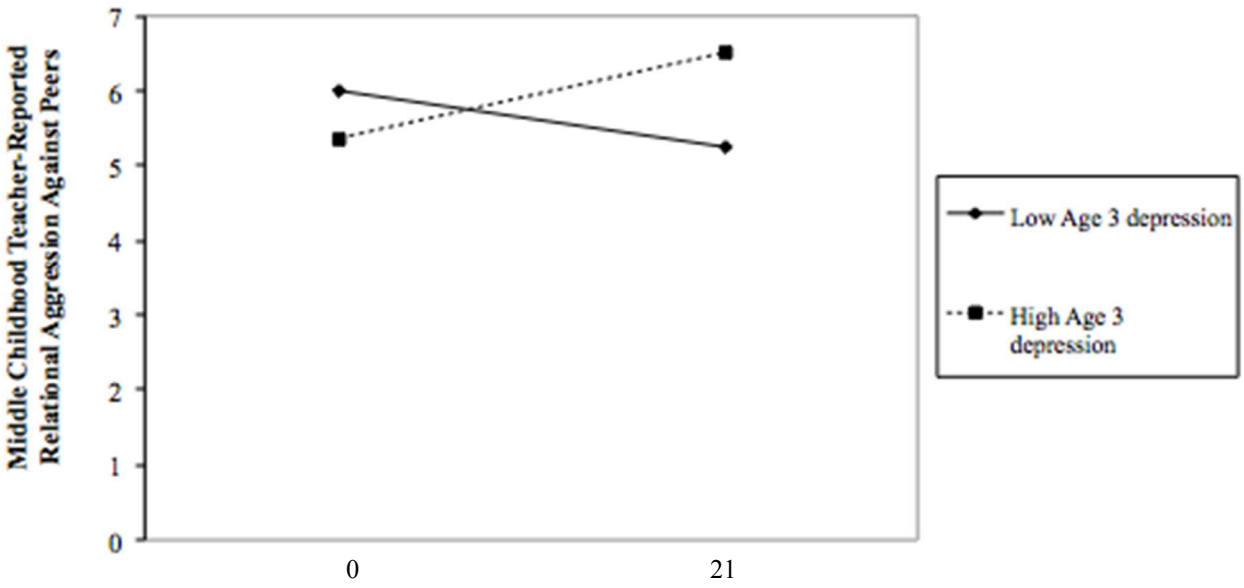

Figure 12.

Interaction between age 3 ODD and age 6 ODD in predicting teacher-reported relational aggression with peers at age 9.

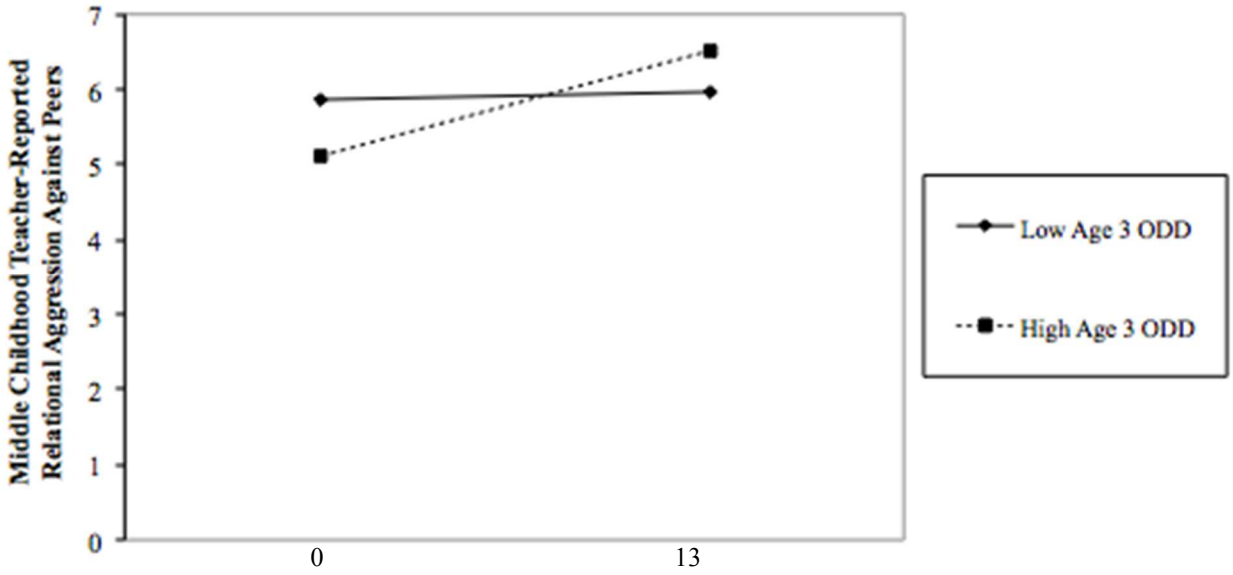

Figure 13.

Interaction between age 3 depression and age 6 depression in predicting teacher-reported child exclusion by peers at age 9.

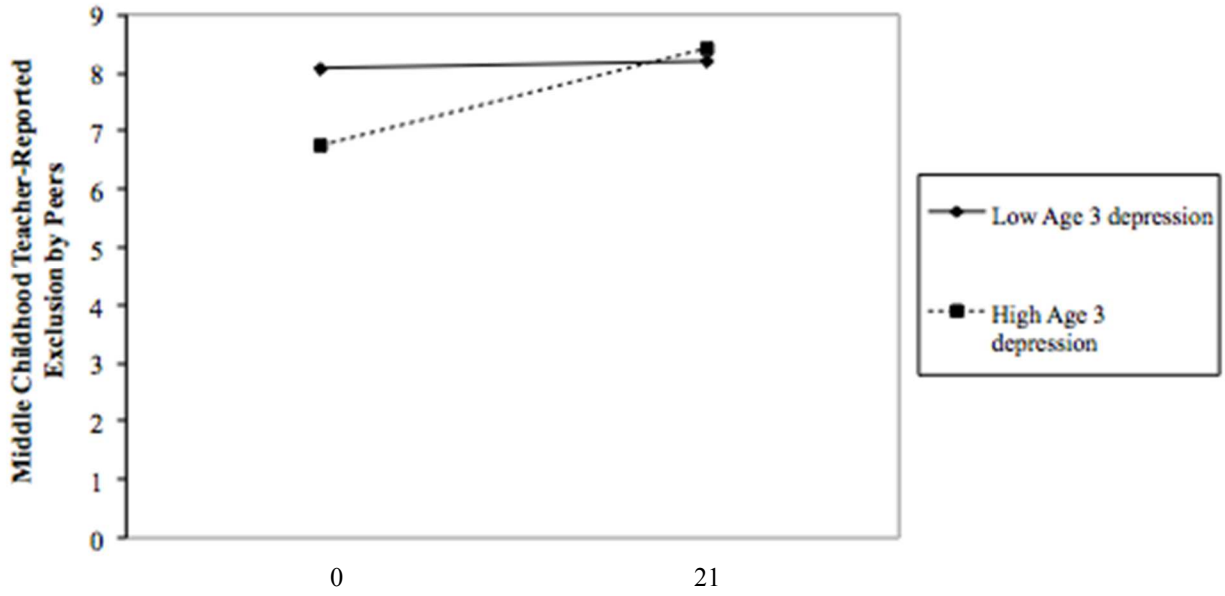

Figure 14.

Interaction between age 3 ADHD and age 6 ADHD in predicting teacher-reported child exclusion by peers at age 9.

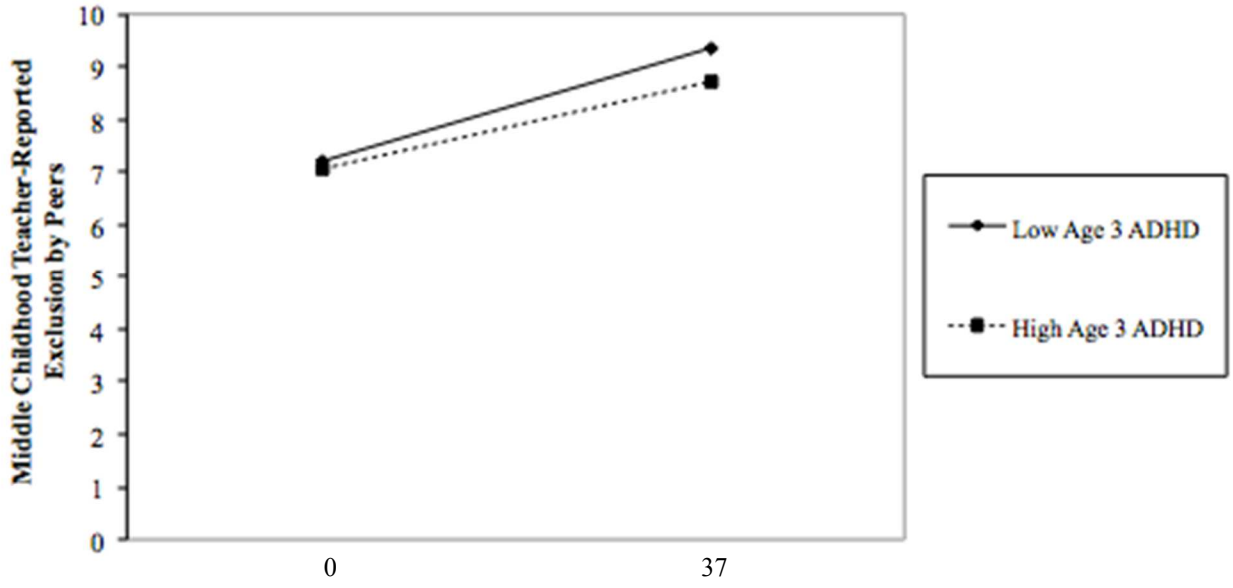

Figure 15.

Interaction between age 3 depression and parental GAF score in predicting the low peer acceptance factor at age 9.

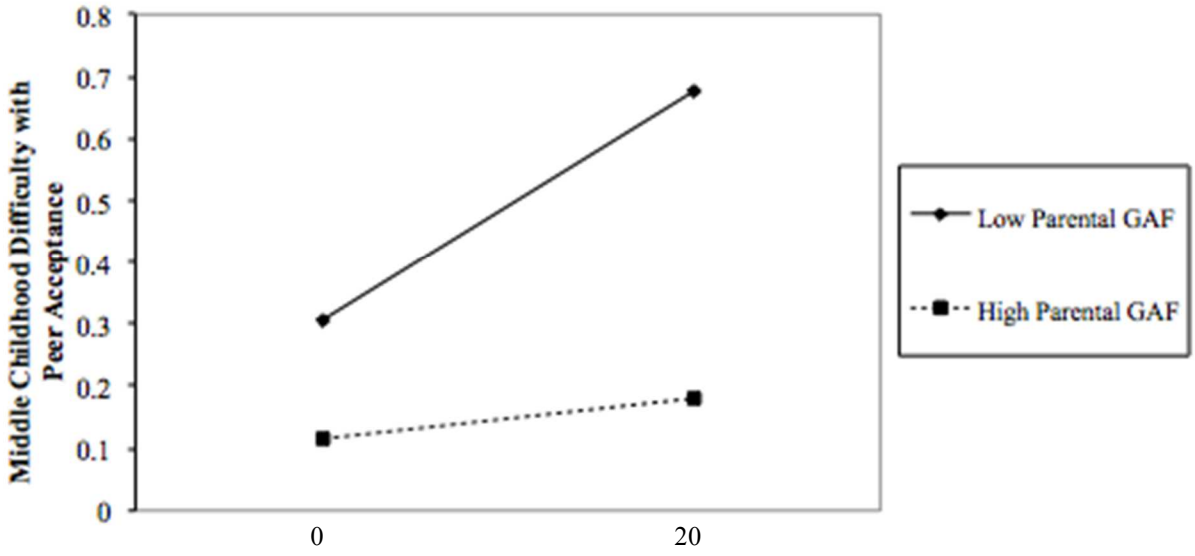

Figure 16.

Interaction between age 3 depression and parental GAF score in predicting the aggression with peers factor at age 9.

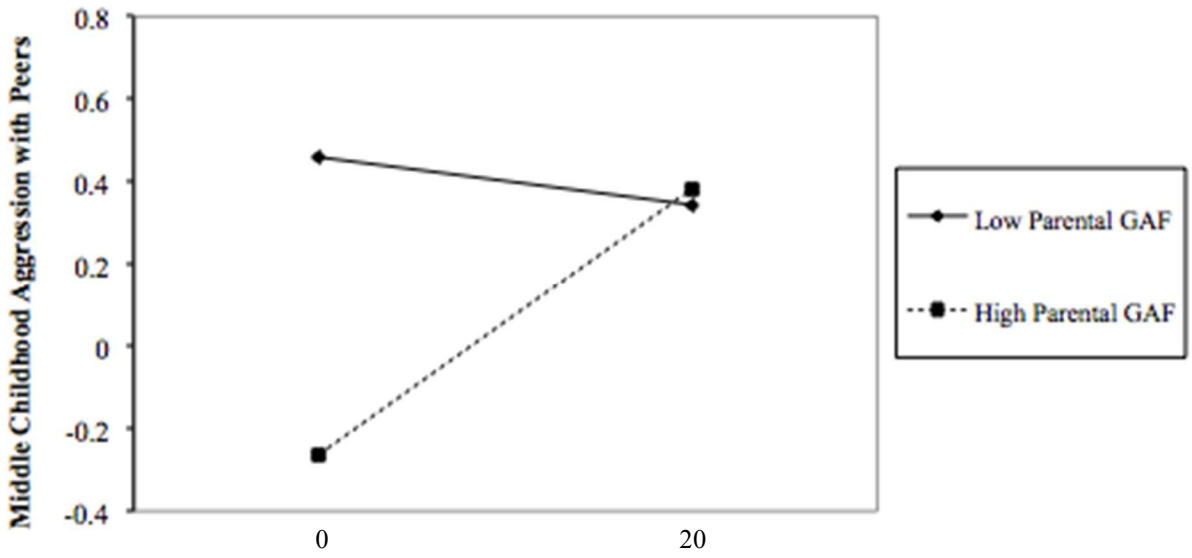

Figure 17.

Interaction between age 3 depression and parental DAS score in predicting the aggression with peers factor at age 9.

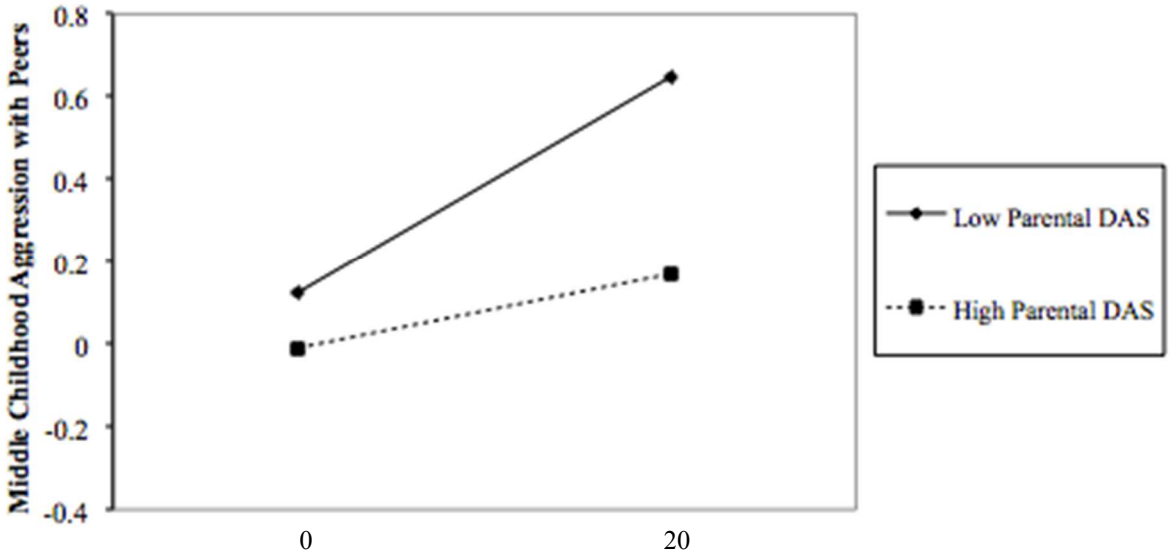

Figure 18.

Interaction between age 3 depression and parental DAS score in predicting teacher-reported exclusion by peers in middle-childhood.