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Factors Influencing Parent-Teacher Discrepancies In Ratings Of Child Externalizing Behavior

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FACTORS INFLUENCING PARENT-TEACHER DISCREPANCIES IN RATINGS OF
CHILD EXTERNALIZING BEHAVIOR

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of the Requirements for the Degree

Doctor of Clinical Psychology

by

Erin F. McTiernan

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ABSTRACT

Informants tend to provide discrepant ratings of child behavior, which can complicate the process of assessing behavior problems in children. The present study evaluated parent and teacher ratings of child externalizing behavior problems, as well as ratings of attention problems, hyperactivity, and aggression, to understand the degree of influence that various factors have on these ratings. A variety of demographic factors (i.e., child age, family income, child ethnicity, parent mental health), parenting and parent-child relationship variables (i.e., attachment, involvement, relational frustration, parenting stress) and school-related factors (i.e., length of time the teacher has known the child, child academic performance) were considered. Specifically, it was predicted that these variables would be significant predictors of discrepancies in parent and teacher ratings of child externalizing behavior. Based on a sample of 188 participants, parent ratings of relational frustration and parenting stress were found to be the strongest predictors of parent-teacher discrepancies across the four areas examined, with greater levels of relational frustration and parenting stress predicting greater differences. Child academic performance was significant or trended toward significance in three of the four models, with greater agreement for ratings of children with lower academic performance. Child age also emerged as a significant predictor or trended toward significance in two of the four models. Findings revealed a tendency for teachers to rate ethnic minority children as displaying more aggressive behavior than Caucasian children; however, ethnicity did not significantly predict the extent of parent-teacher differences. Results suggest that parents who report more parenting

stress produce more severe ratings of child behavior problems as compared to teachers. Results also highlight the importance of considering demographic factors (e.g., child age, ethnicity) when understanding informant discrepancies. The current research contributes to the understanding of how a variety of demographic, parenting, and school-related factors contribute to informant discrepancies and has implications for better understanding rater discrepancies in the assessment of ADHD.

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TABLE OF CONTENTS

ABSTRACT.....	iii
ACKNOWLEDGMENTS	v
LIST OF TABLES.....	ix
INTRODUCTION	10
REVIEW OF RELATED LITERATURE	16
Assessment of Externalizing Disorders	16
Informant Discrepancies	18
Reasons for Discrepancies	19
Measurement Error	20
Situation Specificity.....	21
Unique Perspectives of Raters	21
Sample.....	23
Theoretical Frameworks	24
Child Characteristics Associated with Parent-Teacher Discrepancies	27
Ethnicity.....	27
Age.....	28
Gender.....	29
Symptom Type and Severity.....	29
Parent Characteristics Associated with Parent-Teacher Discrepancies	30

Parental Education and Socioeconomic Status	31
Parenting Stress.....	32
Parent Psychopathology.....	33
Parent-Child Relationship and Parent-Teacher Discrepancies	38
Attachment.....	39
Family Functioning.....	40
Academic Factors Associated with Parent-Teacher Discrepancies	41
Academic Performance.....	41
Length of Time Teacher Has Known Child.....	42
Research Examining Multiple Predictors of Discrepancies.....	43
Present Study	47
Hypotheses.....	48
METHOD	51
Participants.....	51
Exclusion Criteria	52
Inclusion Criteria	53
Measures	53
Behavioral Assessment System for Children, Second Edition.....	53
Conners-March Developmental Questionnaire.....	54
Academic Performance Rating Scale.....	54
Parenting Relationship Questionnaire.....	55
Parenting Stress Index - Short Form.....	57
Procedure	58

RESULTS	60
Plan of Analysis	60
Descriptive Analyses	61
Correlational Analyses.....	61
Regression Analyses	62
Predicting Discrepancies in Ratings of Externalizing Problems	62
Predicting Discrepancies in Ratings of Hyperactivity.....	64
Predicting Discrepancies in Ratings of Attention Problems.....	65
Predicting Discrepancies in Ratings of Aggression.....	66
Supplemental Analyses.....	67
DISCUSSION.....	70
Influence of Demographic Variables	71
Influence of Parenting Variables	75
Influence of Academic Variables.....	78
Other Findings	80
Clinical Implications.....	81
Limitations and Future Research	84
REFERENCES	97

LIST OF TABLES

Table 1. Participant Demographics.....	89
Table 2. Mean, Standard Deviation, and Range for Primary Research Variables.....	90
Table 3. Correlations Between Primary Research Variables.....	92
Table 4. Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Externalizing Problems Scale.....	93
Table 5. Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Hyperactivity Scale.....	94
Table 6. Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Attention Problems Scale.....	95
Table 7. Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Aggression Scale.....	96

CHAPTER 1

INTRODUCTION

Historically, the assessment of psychopathology in children has relied on a single informant (e.g., parent, teacher, clinician) to provide reports of child behavior (Loeber, Green, & Lahey, 1990). More recently, the use of multiple informants' reports of child behavior has been determined to be an essential component of assessment, as different informants are assumed to each carry their own valid and unique perspectives of the child being evaluated (De Los Reyes, Thomas, Goodman, & Kundey, 2013; De Los Reyes, Henry, Tolan, & Wakschlag, 2009). To maximize the clinical value offered by the multi-informant approach, the informants selected to provide reports should differ in their opportunities for observing the child's behavior (e.g., observations that vary across home and school contexts). However, this approach is not without its limitations.

One of the most consistent and well-documented findings in the assessment of children's mental health problems is that different informants tend to provide discrepant ratings when evaluating child behavior (Achenbach, McConaughy, & Howell, 1987; De Los Reyes et al., 2015). An influential meta-analysis conducted by Achenbach and colleagues (1987) examining the consistency between different informants' reports of children's behavioral and emotional problems revealed only low-to-moderate agreement between these ratings. Almost 30 years later, De Los Reyes and colleagues (2015) investigated whether these results have stood the test of

time by conducting a similar meta-analysis using studies that have been conducted since the original 1987 study. Consistent with Achenbach et al. (1987), they observed low-to-moderate cross-informant correspondence for both child internalizing and externalizing concerns.

De Los Reyes and Kazdin (2005) highlight the fact that because no single measure or method exists as the “gold standard” for the assessment of psychopathology in children, the use of multiple informants becomes an essential aspect of evaluating a child’s social, emotional, and behavioral functioning in multiple settings. The use of ratings from multiple informants can offer obvious advantages, such as obtaining ratings of child behavior across settings to examine whether children display differences in their behavior in different contexts. When these ratings are inconsistent, however, it can complicate the process of assessment, classification, and treatment of child psychopathology for researchers and clinicians alike (De Los Reyes & Kazdin 2005, De Los Reyes et al., 2009; Hawley & Weisz, 2003; Youngstrom, Findling, & Calabrese, 2003). Thus, it is important to gain further understanding as to why informant discrepancies so commonly occur.

Several potential explanations as to why low correspondence among informants is so prevalent have been hypothesized. One factor, measurement error, has historically been regarded as an inconvenient, but unavoidable aspect of psychological assessment (De Los Reyes, 2011). However, while measurement error has been shown to likely account for some degree of discrepancy, the magnitude of rater differences suggests that other factors must also contribute to rater variance. For example, De Los Reyes et al. (2009) observed child disruptive behavior during a laboratory task and found substantial variation in patterns of behavior related to who was interacting with the child (parent versus examiner), and with corresponding relations to who was reporting disruptive behavior symptoms (parent versus teacher). The authors concluded that

informant discrepancies are therefore clinically meaningful and not merely comprised of measurement error alone.

Building on this example, another primary explanation for low rater agreement is that it reflects the contextual variations in which informants observe the child's behavior, known as situation specificity. In other words, children exhibit different behavior in different settings, causing raters to produce discrepant ratings. Achenbach et al. (1987) found some support for this argument, as the correlations between informants in the same setting (e.g., mother and father) were significantly higher than the correlations between informants in different settings (e.g., parent and teacher). However, situation specificity alone cannot account for discrepancies, as correlations between pairs of informants seeing children under generally similar conditions were still only moderate (Achenbach et al., 1987). Another important explanation for the occurrence of discrepant reports among informants is rater bias, which refers to the belief that discrepancies occur because each informant has his or her own unique perspective, as well as differing motivations for providing ratings of children (Dumenci, Achenbach, & Windle, 2011). Numerous studies have also found support for informant mental health (e.g., stress, depression) to have a significant impact on ratings of child behavior (Chi & Hinshaw, 2002, De Los Reyes & Kazdin, 2005; Richters, 1992).

The present study aims to examine a variety of child, parent, and school-related factors that may contribute to discrepancies in parent and teacher ratings. Several child-specific characteristics have been identified as significant predictors of rater discrepancies. Some of these factors include child age, ethnicity, and family income. For example, informant ratings for younger children tend to be more consistent as compared to ratings for adolescents, which is often attributed to the fact that younger children may spend more time with those that are

providing ratings and display more easily observed behaviors (e.g., physical aggression) as compared to older children (Achenbach et al., 1987; De Los Reyes et al., 2015). Family socioeconomic status (SES) has also been identified as a significant predictor of discrepancies; specifically, lower family income is associated with greater disparities between parent and teacher reports (De Los Reyes & Kazdin, 2005).

Several parent and family-related variables have also been found to predict informant discrepancies. Connolly and Vance (2010) determined that higher levels of family dysfunction are associated with higher parent-reported levels of aggression in children, which contributed to greater parent-teacher discrepancies. Greater parent-child relationship conflict may result in greater child behavior problems at home as compared to school, contributing to greater parent versus teacher reports of child behavior problems. Differences may also result from rater bias, as parents who perceive more conflict in the parent-child relationship may rate the child as having more behavior problems as compared to teachers. Parental stress has also been consistently shown to contribute to discrepancies among ratings of child behavior, with parents who report higher levels of stress also reporting greater child behavior problems as compared to teachers (De Los Reyes & Kazdin, 2005; Kolko & Kazdin, 1993; Youngstrom, Loeber, & Stouthamer-Loeber, 2000). However, research has not yet identified the specific process by which parental stress may influence rater discrepancies.

The present study also considered parent mental health as a possible predictor of informant discrepancies. Empirical support has been found for the depression-distortion hypothesis, which states that parents with depression produce inflated ratings of child behavior (Richters, 1992). Less empirical attention has been given to understanding how other parental mental health conditions contribute to discrepancies in parent-teacher ratings. Some attention has

focused on maternal anxiety, with most research finding that anxious mothers produce higher ratings of child behavior problems than non-anxious mothers, which in turn results in higher maternal ratings of child behavior as compared to teacher ratings (De Los Reyes & Kazdin, 2005). Maternal ADHD has also been shown to predict higher parent than teacher ratings of ADHD symptoms among children (Yeguez & Sibley, 2016).

Perhaps the least commonly studied factors when examining the literature of parent-teacher discrepancies includes school-related factors, as research has historically focused much more heavily on parent- and child-related factors as they relate to discrepancies (De Los Reyes et al., 2015). The present study considered how teacher-reported academic performance and the length of time the teacher has known the child contribute to parent-teacher discrepancies. Takeda, Nissley-Tsiopinis, Nanda, and Eiraldi (2016) found that parents reported greater levels of child ADHD symptoms as compared to teachers when children had more homework problems at home. Degree of familiarity with the child has also been suggested to be a potential predictor of parent-teacher discrepancies, as teachers generally have much less familiarity with the child on whom they are reporting than do parents. Zahner and Daskalakis (1998) demonstrated that teacher familiarity and contact with the child were significant predictors of agreement between parent and teacher reports of both internalizing and externalizing child behavior.

Although discrepancies between parent and teacher ratings of child behavior are the norm more often than the exception, research has only begun to understand the specific factors that contribute to these discrepancies. In addition, there are very few studies that consider the relative contributions of child, parent/family, and teacher factors that may predict rater discrepancies (De Los Reyes & Kazdin, 2005). In addition to being difficult to understand, informant discrepancies can obscure accurate prevalence rates as well as complicate the decisions of how to intervene

appropriately. The present study adds to the literature by considering the relative contributions of a variety of both well known and less commonly studied child-, parent-, and school-related factors on rater discrepancies. Understanding the influence of these factors can assist clinicians and researchers in better understanding discrepant reports when evaluating child behavior.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Assessment of Externalizing Disorders

Externalizing disorders are typically defined as the expression of overt problematic behaviors, including hyperactivity, impulsivity, and aggression, that interfere with a child's overall functioning for an extended period of time (Korsch & Petermann, 2014). Externalizing behavior problems have been shown to negatively impact several areas of a child's life, including academic performance, peer relationships, and social acceptance (Henricsson & Rydell, 2006). Historically, the assessment of childhood externalizing disorders has relied on a single informant to provide reports of a child's behavior (Loeber et al., 1990). However, research has shown that this method does not always provide clinicians with a comprehensive description of a child's behavior (De Los Reyes & Kazdin, 2005). Presently, the most common strategy for assessing contextual variations in behavior is the multi-informant assessment approach, as this approach can offer a variety of advantages that cannot be obtained by a single informant (Holmbeck, Li, Schurman, Friedman, & Coakley, 2002).

One of the most commonly diagnosed externalizing behavior disorders in children is Attention-Deficit/Hyperactivity Disorder (ADHD). Contemporary guidelines for evidence-based assessment of children with ADHD recommend obtaining reports of the child's behavior from multiple raters in multiple settings (American Academy of Child and Adolescent Psychiatry,

2007; American Academy of Pediatrics (AAP), 2011). This strategy requires having individuals who are familiar with the child rate the child's behavior in the context in which they interact with the child. Informants most often include parents rating child behavior that occurs at home and in the community and teachers rating child behavior they observe in the school environment. If children are old enough, they may also provide reports about their own behavior. Trained raters (e.g., clinicians, research assistants) may also complete reports, including clinical interviews or independent observations of child behavior. The multiple informant method allows clinicians to understand the degree to which a child displays a specific behavior across contexts (Dirks, De Los Reyes, Briggs-Gowan, Cella, & Wakschlag, 2012).

Clinicians are encouraged to take into account variations in functioning across settings. For example, the DSM-IV-TR required some impairment from symptoms be present in at least two different settings (e.g., home, school) to meet criteria for a diagnosis of ADHD (American Psychiatric Association, 2000). Similarly, DSM-5 requires several symptoms to be present in two or more settings (American Psychiatric Association, 2013). For the diagnosis of another commonly occurring externalizing behavior disorder, Oppositional Defiant Disorder (ODD), a severity specifier (i.e., mild, moderate, severe) was added in the DSM-5, with a rating of mild given when symptoms occur in one setting, moderate in two settings, and severe in three or more settings. This rating was added to reflect research demonstrating that the degree of pervasiveness of symptoms across settings is an important indicator of severity (American Psychiatric Association, 2013). Thus, consideration of behavior in multiple settings is particularly important when evaluating for and diagnosing externalizing disorders.

Studies of parent-teacher agreement of ADHD symptoms have been primarily motivated by the popular practice of considering parent and teacher reports of child ADHD symptoms to

support diagnostic criteria that symptoms are present in two or more settings to warrant a diagnosis of ADHD (Barkley, 2015). Informant, rather than child self-report, is typically recommended because children with externalizing disorders such as ADHD tend to underreport symptoms to such an extent that the presence of the disorder may be masked (Sibley et al., 2013).

Informant Discrepancies

Although reports from multiple informants are recommended when assessing for child psychopathology, it has been repeatedly demonstrated that informants display low-to-moderate agreement when rating child behavior (Achenbach et al, 1987; De Los Reyes et al., 2015). Lapouse and Monk (1958) were the first to demonstrate this phenomenon. The aim of their epidemiological study was to estimate the prevalence of mental health concerns in children between the ages of 6 and 12. Mothers and their children were asked to rate how often the child demonstrated various behaviors (e.g., overactivity, restlessness, stuttering). The groups produced significant differences in their ratings, particularly among behaviors that are more subjectively defined and less outwardly observable. The authors noted that these differences can obscure the actual prevalence rates of these symptoms and make it difficult to determine the “optimal” informant when collecting data on these behaviors.

Achenbach et al. (1987) highlighted the robust nature of the literature examining low correspondence between informants in an influential meta-analysis of 119 studies that utilized multiple informants to rate child behavioral and emotional problems. The study examined cross-informant correlations between raters who observed a child’s behavior in similar settings (e.g., mother and father) as well as raters from different settings (e.g., parent and teacher). The mean correlation between reports from similar informants was .60 and the mean correlation between

reports from different types of informants was .28. This finding suggests that both situation specificity as well as informants' unique perspectives contribute to informant discrepancies.

Almost 30 years later, De Los Reyes and colleagues (2015) published an updated version of the Achenbach et al. (1987) meta-analysis. The authors conducted a quantitative review of 341 studies of cross-informant correspondence in reports of children's internalizing and externalizing mental health concerns published between 1989 and 2014. Similar to the findings of Achenbach et al. (1987), the authors observed an overall cross-informant correlation of .28, with low-to-moderate and statistically significant magnitudes of cross-informant correspondence for both internalizing and externalizing behavior. The correlation between parent and teacher agreement for child externalizing behavior was also .28. The authors highlighted a number of findings consistent with previous reviews. First, they noted that informants' reports of more easily observable behavior were more similar than less clearly-defined behavior. They also reported that, similar to previous studies, pairs of informants that observed children in the same setting (e.g., mothers and fathers) provided the most similar reports as compared to all other informant pairs. Finally, they found greater levels of correspondence on measures with greater reliability and validity estimates and dimensional as compared to categorical measures.

Reasons for Discrepancies

Research conducted over the past decade has focused on determining possible causes and meanings of discrepancies between raters. Several explanations of why informant discrepancies are so prevalent when rating child behavior have been proposed, including measurement error, situation specificity, unique or biased perspectives of raters, and the sample from which ratings are being collected.

Measurement Error

De Los Reyes (2011) noted that, historically, researchers have displayed a tendency to attribute low informant correspondence primarily to statistical or experimental errors, more commonly referred to as measurement error. As a result, these discrepancies were dismissed and rendered an unfortunate, but inevitable result of psychological assessment. However, Achenbach et al. (1987) noted that even when comparing ratings on measures with strong psychometric support, agreement between raters is moderate at best. Similarly, Gomez (2007) used differential symptom functioning to examine parent-teacher agreement on a commonly used measure to rate ADHD symptoms in children. It was found that low agreement is reflective of true differences in the degree of the symptom being rated and that differences can be interpreted as an indication that the symptom is situation-specific. These findings suggest that the low levels of agreement across ratings should be seen as valid and attributable to factors other than measurement error. Achenbach (2011) further notes that attributing informant discrepancies to measurement error may obscure the unique contributions that different informants are able to provide, such as identifying problems that may warrant treatment that occur in one setting but not others.

De Los Reyes (2011) examined parent and teacher ratings of disruptive behavior in multiple settings and demonstrated that informant discrepancies consistently provide information about how child behavior differs in specific settings as well as how informants perceive such behavior. He also noted that informant discrepancies consistently appear in both clinical and community samples, predict negative outcomes for future child behavior in ways that other assessment techniques cannot, and can be utilized to understand and predict treatment outcomes. Ultimately, De Los Reyes argues that discrepant reports can provide valuable information about

how a child's behavior may differ across settings and assist clinicians in determining where to target treatment efforts.

Situation Specificity

It has been demonstrated that child externalizing behavior problems are caused by an interaction of biological, psychological, and sociocultural factors that pose risk for, or offer protection against, developing maladaptive reactions to environmental or social contexts (De Los Reyes et al., 2015). A growing body of research consistently suggests that different environments may elicit unique child behaviors (Achenbach et al., 1987; De Los Reyes & Kazdin, 2005). In other words, children display different behaviors depending on the setting in which they are being observed.

De Los Reyes et al. (2009) examined child disruptive behavior across varying social contexts in the laboratory and whether they related to parent-teacher discrepancies in ratings of disruptive behavior. They demonstrated that children's behavior was indeed different across conditions, supporting the theory that informant discrepancies exist, at least in part, because of situation specific behavior and its effects on informants' perspectives on this behavior. When children display problematic behavior in some contexts, but not others, discrepant reports are actually valid and thus should be interpreted as reflecting situation-specific differences (De Los Reyes et al., 2015).

Unique Perspectives of Raters

The effect of differing environments is not the only factor than can contribute to discrepant ratings of child behavior. Parent and teacher ratings may also differ based on each rater's unique perspective. Campbell and Fiske's (1959) multitrait-multimethod matrix (MTMM) has been applied to the literature on rater differences by treating each informant as a method of

measurement (Achenbach, 2011). According to this perspective, discrepancies reflect systematically unique perspectives of the behavior that is rated. From this view, discrepancies between parent and teacher ratings describe more about the characteristics of the raters than about the behavior being rated (Dumenci et al., 2011).

One factor that may contribute to differences in perspectives is the amount of historical knowledge that an informant has about a child. A teacher may rate a child's behavior differently at the beginning of the school year than at the end of the school year. Likewise, a teacher who sees the child throughout the school day as opposed to one class period has more opportunity to observe the child's behavior in different situations. Similarly, parents typically have much more exposure to and knowledge of their child's behavior, providing them with a large sampling advantage as compared to teachers. Amount of experience with children in general may also influence these unique perspectives. Teachers may have a more nuanced understanding of age-appropriate child behavior due to greater experience with children across the age span as well as their ability to compare a child's behavior to those of other children in the classroom (Berg-Nielsen, Solheim, Belsky, & Wichstrom, 2012; De Los Reyes et al., 2009).

Another factor that can contribute to different perspectives is a concept known as rater bias. One commonly discussed bias is known as mood congruent reporting bias, in which ratings of the informant are dependent on the mood of the informant at the time (De Los Reyes et al., 2013). For example, a more negative mood state (e.g., stress, depression) could lead an informant to report more negative child characteristics, which may reflect informant mood more so than actual child behavior. Another commonly discussed bias is referred to as the halo effect, which occurs when an informant provides inflated ratings associated with one disorder (e.g., ODD) when a child displays characteristics of another disorder (e.g., ADHD) (Dirks et al., 2012).

Although rater bias is common, it has been found to account for only a minimal amount of the total variance in discrepancies between informant reports (De Los Reyes et al., 2013; Youngstrom, Izard, & Ackerman, 1999).

Sample

Another factor that influences informant discrepancies is the type of sample from which child ratings are being solicited. For example, parents drawn from clinical samples may tend to over-report child problems due to the desire to elicit services (De Los Reyes & Kazdin, 2004). In contrast, parents from a community sample that provide child behavior ratings may under-report problems to avoid stigmatizing their child or attracting unsolicited involvement from professionals (Berg-Nielsen et al., 2012). Kolko and Kazdin (1993) found that agreement between children, parents, and teachers on ratings of emotional and behavioral problems was higher in community as compared to clinical samples. Different informants drawn from the same sample can also differ in their ratings depending on their motivations for completing these ratings. In situations in which child behavior is being assessed for the purpose of planning treatment, informants may respond differently depending on the extent to which they feel the child is in need of treatment (De Los Reyes & Kazdin, 2005). For example, parents who are seeking treatment for their child may report higher ratings of child behavior problems than teachers who may have less incentive for the child to obtain treatment.

Although both the situation specificity and rater bias perspectives have broad empirical support, each perspective seemingly ignores the contributions of the other (Dumenci et al., 2011). The situation specificity hypothesis tends to disregard rater bias, resulting in an overestimation of context-specific difference, whereas the rater bias perspective discounts

contextual behavior, resulting in an overestimation of systematic error variance. As a result, several theoretical frameworks have been proposed in an attempt to blend these perspectives.

Theoretical Frameworks

De Los Reyes and Kazdin (2005) argue that a theoretical framework to understand discrepancies is necessary to guide research and theory in both research and clinical settings. Consequently, a number of measurement models that attempt to explain informant discrepancies have been proposed. De Los Reyes and Kazdin (2005) were the first to create a model examining informant discrepancies in a clinical setting. They created the Attribution Bias Context (ABC) model, which suggests that discrepancies reflect cross-contextual differences not only in child behavior, but also in the informants' perspectives of that behavior. In other words, different settings hold the potential to evoke different behaviors from children, *and* different informants perceive these behaviors differently. For example, a child may display more defiant behavior at home than at school, and the child's mother may rate this behavior as more severe than would the child's father. De Los Reyes and Kazdin consider socio-cognitive theories, such as the actor-observer phenomenon, to explain the differing motivations that informants have for participating in clinical assessment and treatment. For example, parents (i.e., observers) are more likely than children to attribute the source of the child's behavior to child dispositions, whereas children (i.e. actors) are more likely to attribute their own behavior to external causes. Different attributions of the child's behavior may lead to different perspectives of whether the child's behavior warrants treatment as well as which problems warrant treatment.

The ABC model contains four components to account for differences in informant attributions and informant perspectives on ratings of child psychopathology in a clinic setting. The *informant attribution* component takes into account differing perspectives of the cause of the

child's behavior problems; the *informant perspectives* component accounts for the informant's belief of whether the child's behavior warrants treatment. The *clinical assessment process* component accounts for whether the informant's attributions and perspectives are consistent with the goal of the clinical assessment process. The final component is the interaction between informants' perspectives and attributions and the goal of the clinical assessment process, which suggests that these three factors interact to produce rater discrepancies. De Los Reyes and Kazdin (2005) explain that the model has important implications both in research and clinical settings. While the model was originally developed to explain discrepancies between parent-child or teacher-child (i.e., actor-observer) dyads, the authors note that the model can be used to understand discrepancies between other pairs of observers as well. For example, although both parents and teachers have similar attributions of the child's behavior (i.e., dispositional), they may produce discrepant reports based on recall of information that is consistent with their individual perspectives of what behaviors warrant treatment. Furthermore, differences in the contexts in which parents and teachers observe the child's behavior exacerbate discrepancies based on rater attributions and perspectives.

Noordhof, Oldehinkel, Verhulst, and Ormel, (2008) developed the Multi-Informant Co-occurrence (MIC) model to understand informant discrepancies between preadolescents, their parents, and their teachers in ratings of internalizing and externalizing behavior problems. The model contains four components: severity, direction, perspective, and context. The severity (S) component refers to the general severity of symptoms; the direction (D) component differentiates between internalizing and externalizing problems; the perspective (P) component takes into account the perspective of the specific informant (i.e., self-report versus other report); the context (C) component accounts for the context in which the observation occurs (e.g., problems that

occur more at school versus at home). The scores for each of the components are combined across informants and calculated using a specific algorithm. The authors explain that this model will increase both the reliability and validity of the measurement of child behavior problems. The reliability increases because combining the reports of multiple informants reduces measurement error, and the validity increases by including the context and perspective components in the model.

Dumenci et al. (2011) also attempted to combine both situation specificity and rater bias perspectives into a single model by proposing that differences between raters are attributable to contextual behavior as seen from the perspective of a particular rater. They proposed a model for estimating both contextual (i.e., behaviors specific to the context from the perspective of an informant) and cross-contextual (i.e., behaviors common across contexts and informants) components of hierarchical constructs. The authors used archival data from 5,543 cases that included at least two informants to measure cross-informant correspondence on the Child Behavior Checklist. Rule breaking and aggressive behavior were included as lower-order constructs and externalizing problems was used as a higher-order construct. The authors found that mother report showed the largest cross-situational consistency, whereas teacher report showed the largest situation-specificity. This model accounts for the variance attributable to the behavior of the person being rated in a particular context from the perspective of a specific informant. The authors state that their model provides support for the notion that assessment procedures need to include information from multiple informants in order to obtain the most comprehensive picture of child problem behavior.

Child Characteristics Associated with Parent-Teacher Discrepancies

De Los Reyes and Kazdin (2005) note that several researchers have directed their attention toward examining characteristics of the child being rated to explain rater discrepancies. Lavigne, Dahl, Gouze, LeBailly, and Hopkins (2015) summarize the current status of the literature on various parent, child, and contextual factors associated with parent-teacher discrepancies. Regarding child-specific factors, the authors note that considerable attention has been paid to understanding how demographic characteristics (e.g., age, gender) are related to the degree of discrepancy among informants. However, they explain that many studies investigating the role of demographic variables do not yield consistent results. Other, non-demographic characteristics (e.g., academic performance, cognitive processes) have received less empirical attention.

Ethnicity

In general, it has been found that discrepancies between parents and teachers are greater when rating the behavior of ethnic minority children as compared to ratings of Caucasian children (De Los Reyes & Kazdin, 2005); however, the pattern of discrepancy has been found by some to vary across ethnicities (Harvey, Fischer, Weieneth, Hurwitz, & Sayer, 2013). Parents of African American children tend to rate their child's behavior as less severe than do their teachers, which in part may explain why African American children identified at risk for ADHD are less likely to be evaluated, diagnosed, and treated (Bussing, Zima, Gary, & Garavan, 2003). Youngstrom et al. (2000) found that teachers showed a small but reliable tendency to rate African American children as exhibiting greater levels of externalizing behavior than did their caregivers. Similarly, a study examining predictors of discrepancies between mother, father, and teacher ratings of hyperactivity, attention problems, and aggression among three-year-old

children revealed that African American parents were more likely to rate all three behaviors lower than teachers (Harvey et al., 2013). In the same study, Latina mothers were found to be more likely to rate their children as having higher levels of hyperactivity and attention problems than teachers, suggesting that children of different ethnic groups should not be combined when analyzing informant discrepancies, as this may mask the possible effects of ethnicity.

Age

Empirical attention has also been given to examining the relationship between child age and informant discrepancies. Generally, agreement between parents and teachers tends to be higher for younger children as compared to older children, which is often attributed to the fact that parents and teachers spend more time with younger children than with adolescents, providing them greater opportunities to observe the child's behavior (De Los Reyes & Kazdin, 2005). Furthermore, both parents and teachers tend to rate younger children's behavior as more severe than that of older children. Achenbach et al. (1987) found that the agreement between informants' ratings was higher for children ages 6 to 11 than for adolescents ages 12 to 19. This finding is likely due to the fact that both internalizing and externalizing behavior in younger children is typically more easily observed by others and more stable across contexts as compared to older children.

Narad and colleagues (2015) found that parents reported greater severity of ADHD symptoms than did teachers, and that both parents and teachers reported higher levels of hyperactivity/impulsivity in younger children than in older children. Interestingly, both parents and teachers reported consistent levels of inattention across development, perhaps due to the fact that children are generally better able to manage hyperactive behavior as they mature, whereas inattention does not follow this same pattern. Another study found that younger children were

rated as having higher levels of all ADHD symptoms, especially for hyperactivity/impulsivity, as compared to older children (DuPaul et al., 2016).

Gender

Although several studies have examined the effect of child gender on informant discrepancies, the majority of research has not found gender to be a significant predictor of rater discrepancies (Berg-Nielsen et al., 2012). Two meta-analytic studies of informant discrepancy failed to find support for child gender as a predictor of rater differences (Achenbach et al., 1987; Duhig, Renk, Epstein, & Phares, 2000). Kolko and Kazdin (1993) found greater parent-child agreement for girls than boys regarding total child behavior problems; however, this effect was not found on more specific scales of child problems. In addition, although some studies have found child gender to be associated with informant discrepancies in clinical, community, and school-based populations, other studies examining ratings of children in these settings have not found gender effects (De Los Reyes & Kazdin, 2005). The inconsistent conclusions regarding child gender appear to suggest that, overall, child gender does not account for a significant proportion of variance in informant ratings; however, particular situations or samples may result in findings in which child gender does contribute to discrepancies (De Los Reyes & Kazdin, 2005).

Symptom Type and Severity

Both type and severity of child behavior has been considered in explaining informant discrepancies. Lapouse and Monk (1958) found that parents and children have higher agreement on behavior that can be objectively measured and clearly defined. This result has been consistently replicated. Three meta-analyses examining informant discrepancies observed greater correspondence between informants' reports of children's externalizing versus internalizing

concerns (Achenbach et al., 1987; De Los Reyes et al., 2015; Duhig et al., 2000). Thus consistent findings indicate that observable, outward behavior produces greater levels of agreement between raters as compared to less observable, internalizing symptoms (Yeh & Weisz, 2001). However, it is important to note that although inter-rater agreement is higher when rating externalizing behavior, overall correlations between raters remain low to moderate.

Discrepancies have also been found in ratings of child externalizing behaviors. One study found no significant agreement between parent and teacher ratings of child ADHD symptoms; however, moderate to high levels of agreement were found for ratings of ODD and Conduct Disorder (CD) symptoms (Antrop, Roeyers, Oosterlaan, & Van Oost, 2002). Among externalizing disorders, it can be argued that ODD and CD symptoms are more easily observable than symptoms of ADHD, particularly inattentive symptoms, which may contribute to the higher levels of agreement among these disorders as compared to symptoms of ADHD. Support for this argument can be found from a study by Narad et al. (2015), which found weak correlations between parent and teacher ratings of inattentive behavior, but moderate to strong correlations for hyperactivity and impulsive behavior.

Parent Characteristics Associated with Parent-Teacher Discrepancies

Considerable attention has been paid to the effects of parent characteristics (e.g., parenting stress, parent psychopathology) on child behavior as well as parents' perceptions of child behavior (Lavigne et al., 2015). Several studies have also focused on how these perceptions contribute to informant discrepancies. However, it is important to note that investigations examining the associations between parent characteristics and informant discrepancies have typically focused almost exclusively on maternal characteristics, since mothers are often in the unique position to observe children under a variety of circumstances and for extensive periods of

time, relative to other informants, such as fathers, teachers, and peers (De Los Reyes & Kazdin, 2005; Richters, 1992).

Parental Education and Socioeconomic Status

Previous research investigating the relationship between SES and rater discrepancies has produced inconsistent results (De Los Reyes & Kazdin, 2005). Studies that have found SES to be a significant predictor have hypothesized that children living in lower SES households may experience greater stress contributing to more negative behavior at home than at school (Harvey et al., 2013). In a meta-analysis of mother-father agreement on child internalizing and externalizing behavior problems, Duhig et al. (2000) found that agreement increased as SES increased, which is consistent with the findings from the national normative sample of the Child Behavior Checklist (Achenbach, 1991). Another study found lower levels of parent and teacher agreement on both child internalizing and externalizing behaviors among families with an annual family income of less than \$35,000, with mothers reporting more problems than teachers (Lederberg-Stone, Speltz, Collett, & Werler, 2013). Other research has failed to find SES as a significant predictor of informant agreement (Kolko & Kazdin, 1993; Chi & Hinshaw, 2002), suggesting that the relationship between SES and informant discrepancies may be better accounted for by other informant characteristics (e.g., parenting stress, parent psychopathology), that are associated with low SES (De Los Reyes & Kazdin, 2005).

Parental education is highly correlated with SES and has also been found to yield inconsistent results within informant discrepancy research. In one study, mothers with less education showed lower overall agreement with teachers when rating child externalizing behavior, as well as a tendency to over-report behavior, relative to teachers (Zahner & Daskalakis, 1998). Conversely, a study by Yeguez and Sibley (2016) found that higher maternal

education level predicted mother ratings of child inattention severity that exceeded teacher reports among ratings of middle school children. The authors suggested that highly educated mothers may be more attuned to their children's symptoms due to more time spent with the child in academic activities (e.g., supervising homework) and/or may display lower tolerance for academic difficulties due to high expectations for strong academic performance. Another study found that maternal education was not associated with discrepancies, but younger mothers were less likely than teachers to rate their child's behavior in the clinical range for externalizing problems (Lederberg-Stone et al., 2013).

Parenting Stress

Greater parental stress has been consistently linked to more severe ratings of child disruptive behavior (De Los Reyes & Kazdin, 2005; Kolko & Kazdin, 1993; Youngstrom et al., 2000); however, research has not identified the specific process by which parental stress may influence these ratings. Some have hypothesized that parent stress may be related to parent psychopathology, which has been shown to contribute to higher ratings by parents than by teachers (Breux, Harvey, & Lugo-Candelas, 2016). Others suggest that elevated stress levels contribute to distorted perceptions of child behavior, which then produces inflated ratings from caregivers (i.e., stress-distortion hypothesis). Alternatively, children who exhibit a greater degree of behavioral issues in the home environment may cause caregivers to experience higher stress levels, thus producing elevated parent ratings of child behavior problems.

A study focusing on parent-teacher agreement on symptom-specific ratings of ADHD in children found that parental stress, but not depression, predicted discrepancy between parents and teachers (Van der Oord, Prins, Oosterlaan, & Emmelkamp, 2006). Similarly, Langberg et al. (2010) found parental stress to be the only significant predictor of mother versus father ratings of

child externalizing behaviors. Because these findings are correlational, the causal nature of this relationship cannot be determined. As mentioned, it is possible that children with more externalizing behavior cause more stress in their parents; however, it is equally plausible that parents with increased levels of stress rate their children as having more behavior problems. In addition, it is possible that other factors may be influencing both variables. Yeguez and Sibley (2016) found that maternal depression did not significantly predict parent-teacher discrepancies for inattentive symptoms, hyperactive/impulsive symptoms, or academic problems in children with ADHD after controlling for parenting stress and maternal ADHD symptoms. Moreover, parenting stress was the only significant predictor for all three areas (i.e., inattentive symptoms, hyperactive/impulsive symptoms, or academic problems) and was associated with the most severe symptom reports by mothers. The authors reported that this result may reflect true situation-specific behavior, with parenting stress stemming from children displaying more significant behavior problems at home as compared to school. However, they also suggested that higher levels of parenting stress may result in inflated ratings from mothers.

Parent Psychopathology

Higher levels of parent psychopathology are associated with higher parent ratings of child psychopathology. Johnston and Mash (2001) note that parent psychopathology is often observed among children diagnosed with externalizing behavior problems. Breaux, Harvey, and Lugo-Candelas (2014) found that mothers who self-reported symptoms of mental health problems when their children were three years old were more likely to rate their children as having both more internalizing and externalizing problems and lower social skills at age six. Harvey, Stoessel, and Herbert (2011) found that maternal depression, anxiety, substance use, and several personality disorder traits were associated with maternal negativity, lack of warmth, and laxness

in parenting practices. These findings suggest a link between maternal psychological functioning and specific parenting practices, which in turn influences child behavior. Moreover, parent psychopathology may contribute to greater bias in ratings of child behavior, contributing to discrepancies between informants.

Parental depression is the most commonly studied type of psychopathology in the context of informant discrepancy research (Lavigne et al., 2015). Chi and Hinshaw (2002) discussed the depression-distortion hypothesis, suggesting that if a parent is depressed, they may experience distorted perceptions and cognitions as well as difficulties in communication, which would impact their abilities to provide an objective evaluation of their child's behavior. In addition, these difficulties are also likely to negatively impact parenting, which may increase the likelihood of negative or conflictual parent-child interactions. Loeber and Hay (1997) found that parents with poorer psychological adjustment exhibit more inconsistent and punitive parenting practices, which are associated with the development of externalizing behavioral problems in children. Connolly and Vance (2010) determined that parents of children with ADHD who rated themselves as having higher levels of depression rated their children as higher in aggression and reported greater levels of family dysfunction. The belief that maternal depression inflates reports of child problem behaviors has generally been based on comparisons of ratings of depressed mothers and teachers or other informants (Chi & Hinshaw, 2002; Richters, 1992).

Although previous studies have found a connection between parental depression and informant discrepancies in ratings of child externalizing problems (Collishaw, Goodman, Ford, Rabe-Hesketh, & Pickles, 2009; Youngstrom et al., 2000), links between parental depression and discrepancies in ratings of child ADHD symptoms specifically have been mixed (Chi & Hinshaw, 2002; Harvey et al., 2013; Van der Oord et al., 2006). Chi and Hinshaw (2002)

examined maternal reports of 96 children between the ages of six and 10 diagnosed with ADHD – combined type. The authors reported that higher levels of maternal depressive symptoms were associated with maternal reports of a more negative parenting style. Maternal depressive symptoms also predicted more negative parent-child interactions. The authors also examined the role of maternal depressive symptoms in discrepancies between mother and teacher report of child ADHD symptoms. They found that maternal depressive symptoms predicted negative biases in their reports of child ADHD symptoms, behavior problems, and their own negative parenting style, contributing to greater parent-teacher discrepancies, with mothers reporting greater levels of ADHD symptoms in their children.

Harvey et al. (2013) found maternal depression to be significantly associated with higher maternal ratings of child attention problems as compared to teachers; maternal depression approached significance as a predictor of differences in ratings of hyperactivity. However, no link between maternal depression and discrepant ratings of aggression was found. Baumann, Pelham, Lang, Jacob, & Blumenthal (2004) hypothesized that the relationship between maternal depression and distorted ratings of child behavior may be confounded by the effects of mother-child history. To examine this hypothesis, mothers with and without a history of depression interacted with and rated the standardized behavior of child confederates, thereby providing an objective standard for rating symptoms. The authors found no significant differences in ratings of the child confederates' behaviors as a function of maternal history of depression or current depressive symptoms, suggesting that other aspects of the mother-child relationship may better explain the tendency for depressed mothers to rate child behavior more severely than mothers without depression.

As previously mentioned, much less research has focused on the influence of paternal depression on informant discrepancies. The research that has been conducted has most commonly revealed that paternal depression is associated with mother-father discrepancies in ratings for younger children more so than older children (Harvey et al., 2013). Kane and Garber (2004) conducted a meta-analysis investigating the impact of paternal depression on child psychopathology and father-child conflict. They found paternal depression to be significantly associated with greater levels of father-child conflict as well as higher levels of father-reported internalizing and externalizing symptoms in children. These results indicate that both maternal and paternal depression likely contributes to more negative ratings of child behavior as well as potential impairment in the parent-child relationship.

Similar to studies examining the depression-distortion hypothesis, research has investigated the role of parental anxiety on reports of child development, emotions, and behavior (Edwards, Rapee, & Kennedy, 2010; O'Connor, Heron, Glover, & the ALSPAC Study Team, 2002). Several studies have found a positive relationship between parental anxiety and discrepancies in informant ratings of child internalizing and externalizing behavior. This discrepancy is thought to be due to the influence of parent psychopathology on perception and ratings of child behavior (i.e., rater bias) (De Los Reyes & Kazdin, 2005). For example, Burnstein, Ginsburg, and Tein (2010) found that children of parents with anxiety were rated as higher in both internalizing and externalizing symptoms as compared to children of parents with no psychiatric diagnosis. Other studies have yielded more inconsistent results. Breaux et al. (2014) found paternal, but not maternal, anxiety symptoms to predict parent reports of child internalizing problems. Krain and Kendall (2000) found that maternal anxiety no longer predicted informant discrepancy after accounting for maternal depression. However, another

study found both maternal anxiety and maternal depression to significantly account for discrepancies between maternal ratings of child negative emotions and behaviors and the ratings of independent observers (Youngstrom et al., 1999). As a result of these inconsistencies, De Los Reyes and Kazdin (2005) highlight the need to further examine parental anxiety as a predictor of informant discrepancies.

Parent ADHD has been shown to be associated with the development of child externalizing behaviors as well as more negative outcomes in parenting and family functioning (Chronis-Tuscano et al., 2011). It is well known that children with ADHD are more likely to have a parent with diagnosed or undiagnosed ADHD due to the heritability of the disorder (Faraone & Doyle, 2001). Maternal ADHD symptoms may increase a parent's sensitivity to their child's behavior, possibly leading to more severe ratings (Chronis-Tuscano et al., 2008). In a study investigating the influence of maternal ADHD symptoms on parenting practices, maternal ADHD symptoms were found to be associated with lower levels of involvement, less positive parenting, and less consistent discipline. In addition, maternal ADHD symptoms were associated with higher levels of negative parenting and greater tendency to repeat commands before giving the child an opportunity to comply (Chronis-Tuscano et al., 2008). Similarly, Murray and Johnston (2006) discovered that mothers with ADHD are lower than mothers without ADHD in parenting consistency and score lower than mothers without ADHD on knowledge about their child's activities. Thus, it might be anticipated that differences in parenting associated with an ADHD diagnosis may influence both child behavior and the parent-child behavior, potentially contributing to rater discrepancies.

Research examining the influence of parental ADHD on ratings of child behavior has yielded mixed results. One study observed no evidence of discrepancy between maternal reports

and child (ages 6 to 17) self-report of overall ADHD symptoms, regardless of parental ADHD (Faraone, Monteaux, Biederman, Cohan, & Mick, 2003). The authors note that these results are in contrast with studies that have found maternal internalizing disorders to be associated with bias in ratings of child behavior. They suggest that deficits in certain cognitive processes or skills that are associated with internalizing disorders may make individuals prone to producing distorted reports of child behavior, whereas deficits in other domains associated with ADHD are not. A more recent study considering discrepancies between mother and middle school teachers' ratings of child ADHD symptoms found that maternal ADHD symptom severity significantly predicted higher parent than teacher ratings on the hyperactive/impulsive dimension (Yeguez & Sibley, 2016). The authors suggest that mothers who struggle with inattention or hyperactive/impulsive symptoms may negatively impact child behavior due to factors such as less structure, inconsistent discipline practices, or elevated mother-child conflict. Mothers with ADHD may also have less patience with their child's behavior problems and may be less reliable or accurate in their ratings, resulting in inflated ratings.

Parent-Child Relationship and Parent-Teacher Discrepancies

Few studies to date have considered the influence of the parent-child relationship on rater discrepancies. One reason for this lack of research may be that the parent-child relationship can be defined in multiple ways and is often composed of several smaller constructs, such as attachment, communication, and conflict. Treutler and Epkins (2003) examined whether qualitative (e.g., parental acceptance) and quantitative (e.g., amount of time spent with child) aspects of the parent-child relationship make unique contributions to mother-child, father-child, and mother-father discrepancies on reports of children's behavior. The authors found that the intensity of parent-child conflict was significantly related to greater mother versus father reports

of child externalizing behaviors. They also found that the amount of time the mother spent with the child was related to mother-father discrepancies of child internalizing behavior, with mothers reporting more child internalizing behavior than fathers. This result suggests that mothers may be more aware of their child's internalizing problems, perhaps due to the greater amount of time spent with the child as compared to fathers.

Kolko and Kazdin (1993) found that lower child acceptance (versus rejection) was related to greater parent-teacher and parent-child discrepancies on reports of externalizing, but not internalizing, behavior. Similarly, Treutler and Epkins (2003) found that both mother and father reports of higher child acceptance were related to lower ratings of child externalizing behavior. The authors note that parental understanding of their acceptance or rejection of the child may help to clarify parental ratings of child behavior and their motivation for treatment. Further, they highlight the importance of considering family relationship variables in understanding rater discrepancies.

Attachment

Parent-child attachment is an integral part of the parent-child relationship. Children with insecure attachment styles have been shown to have higher rates of externalizing problems than children with secure parent-child attachment (Bohlin, Eninger, Brocki, & Thorell, 2012). Moss et al. (2006) found that children with ambivalent (i.e., exaggerated intimacy with or dependence on parent) and controlling (i.e., role reversal between parent and child) attachment styles had higher ratings by both parents and teachers on aggression and conduct problems as compared to children with secure attachment. Thorell, Rydell, and Bohlin (2012) found that children who displayed disorganized attachment exhibited more ADHD symptoms as compared to children with secure attachment representations, regardless of the child's executive functioning ability or

comorbid conduct problems. Similarly, Scholtens, Rydell, Bohlin, and Thorell (2014) found that children in the disorganized attachment category had significantly higher ADHD symptoms as compared to children in the secure category. While several studies have assessed the relationship between parent-child attachment and child externalizing behavior problems, there is currently a lack of research that examines the role of attachment in parent-teacher discrepancies.

Family Functioning

Family functioning is typically considered to encompass a variety of domains including problem solving, communication, role functioning, affective responsiveness, affective involvement, and behavior control (Epstein, Ryan, Bishop, Miller, & Keitner, 2003). Lower levels of family functioning have been found to relate to greater child behavioral problems. For example, Johnston and Mash (2001) note that disturbances in family functioning, conflicted parent-child relationships, and increased parenting stress are commonly observed among families of children diagnosed with externalizing behavioral disorders. These issues may be reflected in more severe reports of child behavior problems by parents than by teachers. Connolly and Vance (2010) found that greater parent as compared to teacher report of child/adolescent aggression was associated with greater family dysfunction. Kolko and Kazdin (1993) found greater agreement between parents and teachers for cases in which parents reported greater family control. Disagreement between teachers and children was associated with high family stress and low family cohesion. Interestingly, none of the specific child characteristics (e.g., gender, ethnicity, and SES) were significant predictors of parent-teacher differences in ratings. These results highlight the importance of considering family characteristics, particularly disturbances in family functioning, when understanding informant discrepancies, especially when parents rate children as having greater problems than do teachers.

Previous dissertation research conducted by Dell (2013) sought to determine the extent to which specific parental discipline behaviors (i.e., laxness, overreactivity, and verbosity) are associated with parent-teacher discrepancies of child behavior ratings, after accounting for known predictors (i.e., parenting stress, SES, and child age). A multiple linear regression was conducted to examine the influence of these variables on parent-teacher discrepancies. Both SES and parenting stress were found to be significant individual predictors of discrepancy, with higher parent income predicting less discrepancy and higher parenting stress predicting increased discrepancy. Contrary to expectations, none of the parental discipline behaviors were found to predict parent-teacher discrepancies. It was suggested that the parenting measure used in the study was too narrow to meaningfully contribute to informant discrepancy research, and that constructs associated with positive parenting (e.g., empathy, warmth) may influence child behavior more strongly than discipline practices.

Academic Factors Associated with Parent-Teacher Discrepancies

Little attention has been given to the influence of teacher- and school-related variables on informant discrepancies of child behavior problems as compared to parent and child factors, despite the fact that child behavior problems often occur in the school setting. Further, those studies that have included the influence of academic factors have generally yielded inconclusive results.

Academic Performance

A child's academic performance is an important factor to consider when understanding rater discrepancies, as poor academic performance may motivate parents or teachers to rate children as more symptomatic in an effort to secure services for the child (e.g., special education, tutoring, medication). Deng, Liu, and Roosa (2004) found that academic performance, as rated

by teachers, was found to significantly predict parent-teacher disagreement on child attention and internalizing problems on the Child Behavior Checklist. Specifically, parent-teacher agreement tended to increase as the child's academic performance increased. In the same study, child gender and age were also correlated with parent-teacher agreement on ratings of behavioral problems, with higher levels of agreement for girls and older children. Harvey et al. (2013) found that preschool children with lower pre-academic skills were more likely to be rated higher on attention problems by teachers than by mothers. The authors suggested that this finding could be due to greater teacher awareness of academic difficulties. Takeda et al. (2016) found that parents who reported more homework problems at home also reported higher levels of ADHD symptoms than did teachers. When teachers reported higher levels of symptoms of ADHD than parents, parents reported fewer homework problems. The authors reported that this finding supports the situation-specificity hypothesis, as children were rated as more symptomatic based on the behavior that they were displaying in that particular context (i.e., homework problems occurring in the home setting).

Length of Time Teacher Has Known Child

As previously mentioned, parents and teachers may have different perceptions of the child's behavior, contributing to rater discrepancies. These disparities in perceptions may occur as a result of informants having different levels of historical knowledge of the child (Takeda et al., 2016). For example, a teacher rating a child's behavior at the beginning of the school year as compared to later in the year may rate the child as having fewer behavior problems due to less time observing the child. Likewise, a teacher that sees a child for only one subject (e.g., math teacher) may rate the child's behavior very differently than a teacher that sees the child for multiple subjects across the day. Similarly, a parent has much more historical knowledge of the

child than does a teacher and is able to observe their child's behavior in multiple settings, which likely results in a greater depth of information.

Zahner and Daskalakis (1998) studied factors that influence agreement between parent and teacher ratings of child psychopathology using a population-based survey of 1,458 children between the ages of 6 and 11. They found that teachers' level of familiarity and contact with the child significantly predicted greater agreement between parents and teachers for both the internalizing and externalizing scales of the Child Behavior Checklist. Berg-Nielsen et al. (2012) also studied parent-teacher disagreement using the Child Behavior Checklist. Consistent with previous research, the authors determined that teachers reported substantially fewer overall problems in children than did parents, particularly on internalizing problems. Also consistent was the finding that the highest parent-teacher agreement was on boys' externalizing problems. In situations when the teacher rated more child problems than the parent, there was evidence of greater conflict in the teacher-child relationship. However, the length of time that the teacher had known the child did not emerge as a significant predictor of agreement.

Research Examining Multiple Predictors of Discrepancies

Treutler and Epkins (2003) examined the influence of parent psychopathology and aspects of the parent-child relationship on discrepancies in mother and father reports of child behavior in a clinical sample of 100 children ages 10–12. The authors found that both maternal and paternal psychological symptoms as well as parent-child relationship variables were significantly related to ratings of children's internalizing and externalizing behaviors. Furthermore, parent-child relationship variables explained significant variability in mother-child, father-child, and mother-father discrepancies in ratings of child behavior. Considering parent psychological symptoms, both maternal and paternal psychopathology made significant and

unique contributions to ratings of child internalizing and externalizing behaviors, after accounting for aspects of the parent-child relationship, including time mother spent with child, father-reported number of topics discussed with their child, and father-reported intensity of discussions. Furthermore, both maternal and paternal symptoms significantly contributed to mother-father discrepancies on ratings of child externalizing behaviors. Considering the parent-child-relationship, both mother and father report of child acceptance (versus rejection) was related to lower ratings of child externalizing behavior. The intensity of parent-child discussion and conflict was also significantly related to mothers' reports of child internalizing and externalizing behaviors. The authors highlight the importance of considering parent-child relationship variables as well as each informant's psychological symptoms in understanding informant discrepancies.

Connolly and Vance (2010) examined psychosocial factors associated with parent and teacher reports of aggression among children and adolescents with ADHD. The authors considered the influence of parent psychopathology, family functioning, marital relationship quality, and child interpersonal relationships (i.e., ability to form and maintain peer relationships) on parent-teacher discrepancies among 676 children between the ages of 6 and 16. Consistent with the literature, agreement between parent and teacher rating of aggression was found to be relatively moderate. The authors determined that higher levels of self-reported parental depression were associated with higher ratings of child aggression. Higher levels of family dysfunction, which included lower general functioning, inability to establish patterns of behavior for each family member (roles), and less affective involvement, were associated with higher parent-reported aggression levels in children and adolescents with ADHD. The only factor associated with both parent and teacher ratings of aggression was deficient child interpersonal

relationships. The authors highlight the importance of considering contextual factors, such as the nature of the child-informant relationship and informant psychopathology, to make sense of variability in informant reports of child behavior.

Yeguez and Sibley (2016) examined predictors of informant discrepancies between mother and middle school teachers' ratings of child ADHD symptoms. The authors examined a number of both mother- and school-related factors in a sample of 112 middle school students with an ADHD diagnosis. The authors conducted three multiple regression analyses to examine discrepancies in inattention, hyperactivity/impulsivity, and academic impairment. Mother-related predictors included single versus dual-parent household, education level, maternal depression, maternal ADHD, and parenting stress. School-related factors were class placement (i.e., general or special education) and documented ADHD diagnosis at school. Results revealed that higher maternal education and higher parenting stress predicted more severe ratings of attention problems from mothers as compared to teachers. When considering ratings of hyperactivity/impulsive behavior, maternal ADHD diagnosis, higher parenting stress, and documented child ADHD diagnosis predicted more severe maternal reports, and placement in a special education classroom predicted more severe teacher reports. Lastly, higher parenting stress predicted greater mother, as compared to teacher, report of child academic impairment. The authors concluded that when rating child behavior, certain perceptual differences might emerge when mothers are highly educated, have pursued documentation of an ADHD diagnosis at school, or possess elevated levels of stress or ADHD symptoms. As such, clinicians who evaluated children with ADHD should consider the influence of mothers' psychological and educational background on their perception of the child.

Takeda et al. (2016) investigated the influence of several factors associated with discrepancies in parent and teacher reports of ADHD symptoms in children. Predictors of parent-teacher discrepancy included demographic variables (ethnicity, SES), comorbidity variables (comorbid internalizing disorder, comorbid externalizing disorder), and academic performance variables (history of special education, history of grade failure, Homework Problems Checklist score), and their interactions. Parents and teachers completed ratings for 1,364 children using an ADHD rating scale. The authors calculated parent-teacher discrepancies on this measure by subtracting the teacher percentile score from the parent percentile score. The authors used deviations from parent ratings as a measure of parent-teacher discrepancy, given that parent ratings tend to be higher than teacher ratings. They chose to use percentile scores versus raw scores given that percentile scores are the scores regularly used by clinicians to make diagnostic decisions. To determine which factors are related to parent-teacher discrepancy, a series of multiple regression equations were used to predict the discrepancy score from each group of variables (i.e., demographic, comorbidity, academic performance). A final multiple regression equation using the significant predictors from the initial regression analyses as well as the interactions between the significant predictors was then calculated to determine the relative weight of each predictor.

Consistent with previous findings, the overall agreement between parent and teacher ADHD ratings was fairly low ($r = .24$). In the first series of regressions, ethnicity emerged as a significant predictor of discrepancy, with a greater discrepancy between parent and teacher ratings for ethnic minority children than for Caucasian children. The presence of a comorbid externalizing disorder was also associated with greater discrepancy. Finally, parents who reported more homework problems at home also reported higher levels of ADHD symptoms than

did teachers. In the final regression using only the significant predictors, comorbid externalizing disorder and homework performance were both significant predictors of the parent-teacher difference scores, with more homework problems predicting greater discrepancy between parent and teacher reports, with parents reporting higher levels of ADHD symptoms than teachers. The presence of a comorbid externalizing disorder was associated with higher levels of agreement between parents and teachers. Additionally, the authors found that parents who reported higher levels of homework problems were of significantly higher SES.

The Takeda et al. (2016) study is one of the first to look at the relative contributions of demographic and school-related factors as they relate to parent-teacher discrepancies. The authors concluded that parent-teacher discrepancy on the reporting of ADHD symptoms is likely to occur when the child has significant homework problems, closely followed by externalizing behavior problems. The authors suggest that parent and teacher ratings of ADHD symptoms be supplemented with specific behavioral observations to determine the extent to which parent-teacher discrepancies are related to differences in impairment in different settings versus differences in informant perspective.

Present Study

Evidence-based assessment of child externalizing disorders recommends the use of multiple informants for better understanding of child behavior (AAP, 2011; Hunsley & Mash, 2007). However, research has repeatedly revealed low-to-moderate levels of agreement between informants when reporting child behaviors (Achenbach et al., 1987; De Los Reyes et al., 2015), which can present challenges to both clinicians and researchers regarding diagnosis and treatment (Yeh & Weisz, 2001). While previously dismissed as simply an inconvenient and unfortunate effect of measurement error, more recent contributions to the informant discrepancy

literature argue that these discrepancies reflect meaningful contextual variations in symptom presentation (De Los Reyes et al., 2015). Moreover, contemporary additions to the research have identified a variety of factors that have been found to influence informant ratings, sometimes resulting in over- or underestimation of child behavior problems (Dumenci et al., 2011).

The present study investigated the relative contributions of a variety of factors that have been shown to contribute to parent-teacher discrepancies in ratings of child externalizing behavior. This study adds to the literature by considering the relative contributions of a variety of both well-known and less commonly studied factors on rater discrepancies. In addition, this study considers a range of demographic, parent report, and academic variables. Demographic variables included child age, ethnicity, family income, and informant mental health. Parenting variables included parenting stress, and aspects of the parent-child relationship (i.e., attachment, involvement, and relational frustration). Academic variables included the length of time the teacher has known the child and child academic performance. This study considered the combination of these variables that best predicts parent-teacher discrepancies.

Hypotheses

1. Consistent with previous research (e.g., Achenbach et al., 1987; De Los Reyes & Kazdin, 2005; Takeda et al., 2016), child age, child ethnicity, family income, and informant mental health were expected to be significant predictors of discrepancies in parent and teacher ratings of child externalizing behavior.
2. Based on previous research (e.g., De Los Reyes & Kazdin, 2005; Kolko & Kazdin, 1993; Youngstrom, Loeber, & Stouthamer-Loeber, 2000), parent ratings of parenting stress on the Parenting Stress Index, Short Form were expected to be a significant predictor, with greater endorsement of parenting stress predicting greater discrepancies.

3. Parent report of relational frustration on the Parenting Relationship Questionnaire was expected to predict parent-teacher discrepancies in externalizing behavior, with greater endorsement of relational frustration predicting greater discrepancies (i.e., parents endorsing more externalizing behavior as compared to teachers).
4. Parent report of attachment on the Parenting Relationship Questionnaire was expected to predict parent-teacher discrepancies in externalizing behavior, with lower report of attachment being associated with greater discrepancies (i.e., parents endorsing more behavioral problems as compared to teachers).
5. Parent report of involvement on the Parenting Relationship Questionnaire was expected to predict parent-teacher discrepancies in externalizing behavior, with lower report of involvement being associated with greater discrepancies (i.e., parents endorsing more behavior problems as compared to teachers).
6. Based on previous findings (e.g., Takeda et al., 2016), greater parent-teacher discrepancies in externalizing behavior were predicted for children rated by their teacher as having more academic difficulties as compared to children rated as having less academic difficulties.
7. Based on previous research (e.g., Takeda et al., 2016), the length of time that the teacher has known the child was expected to predict parent-teacher discrepancies in externalizing behavior, with longer time known predicting higher levels of parent-teacher agreement.
8. Based on previous research considering family factors in explaining parent-teacher discrepancies in ratings of child behavior (e.g., Dell, 2013), parenting stress and family income were expected to be the strongest predictors of discrepancies in parent-teacher ratings of externalizing behavior.

9. Factors found to be significant predictors for parent-teacher discrepancies in ratings of externalizing behavior were expected to be significant predictors of parent-teacher discrepancies in ratings of ADHD behavior (i.e., hyperactivity, inattention) specifically.

CHAPTER 3

METHOD

Participants

The present study utilized archival data based on evaluations conducted with children at a university-based ADHD evaluation clinic. An a priori power analysis indicated that the ideal sample size (N) would include at least 130 participants, given the number of predictor variables considered. The sample used for this study included 188 children (130 males, 58 females) between the ages of 5 and 12 years old ($M = 95.76$ months, $SD = 19.50$ months) who were referred for an ADHD evaluation between 2012 and 2018. In terms of ethnic background, the majority (90.4%) of participants were identified as Caucasian; the remaining children identified as Biracial (5.9%), African American (1.6%), Hispanic (1.6%), or other (0.5%). For the present study, all ethnic minority children were combined and data were analyzed comparing Caucasian vs. non-Caucasian participants. Over half (51.6%) of participants reported an annual income of \$30,000 or less, 28.2% reported a yearly income between \$30,000 and \$60,000, and 20.2% reported an annual income over \$60,000. Of the children included in the sample, 70.5% met DSM-IV-TR or DSM-5 diagnostic criteria for an ADHD diagnosis (51.9% ADHD-combined type, 11.5% ADHD-not otherwise specified, 5.5% ADHD-inattentive type, and 1.6% ADHD-provisional or rule-out). In addition, 72.7% of those children also met criteria for a second, non-ADHD diagnosis (e.g., ODD, anxiety or mood disorder, learning disorder).

For 82.4% of cases, the child's mother completed the parent materials. The remaining cases were completed by the child's father (11.7%), grandparent (1.6%), adoptive parent (1.6%), stepparent (1.1%), or other (e.g., aunt) (1.6%). For 67.2% of cases, informants reported having no mental health problems. The remaining informants reported having depression (9.1%), anxiety (5.4%), ADHD (1.6%), substance use (0.5%), more than one mental health problem (12.9%), or other (3.2%). For the present study, informant mental health was coded as a dichotomous variable (0 = no report of past or present mental health diagnosis, 1 = past or present mental health diagnosis). Table 1 contains frequencies and percentages for participant demographic information.

Exclusion Criteria

Children with both Verbal and Performance IQ of below 70 were excluded from the present study, as lower IQ may differentially affect teacher versus parent ratings (e.g., special education teachers may use a comparison group of other students in the special education classroom, whereas regular education teachers are using students in the regular education classroom). Children taking medication for ADHD at the time of the evaluation were excluded only if there was inconsistency in medication status between parent and teacher ratings (i.e., teacher rated the child on medication and parent rated off medication). Caregivers who had not had contact with the child for at least one year were excluded from the study. Because this study investigated potential biases that contribute to inflated parent or teacher ratings of child behavior, elevated validity scores on the behavior rating scale (BASC-2) completed by parents or teachers did not warrant exclusion from the present study.

Inclusion Criteria

Children both with and without a diagnosis of ADHD were included in the present study, as the present study focuses broadly on externalizing behaviors associated with ADHD and ODD rather than diagnosis of either disorder. The presence of comorbid disorders (both internalizing and externalizing) did not warrant exclusion from this study, as comorbidity is very common among children presenting with externalizing behavior problems.

Measures

Behavioral Assessment System for Children, Second Edition

The Behavioral Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004) is a broad-range behavior rating scale that measures a variety of domains. The BASC-2 provides self, parent, and teacher rating forms for the assessment of child behavior. For the present study, ratings from both parents and teachers were considered. Parents responded to 160 items and teachers responded to 139 items rated on a four-point Likert-type scale (never, sometimes, often, almost always). Teacher forms provide standard scores for the domains of externalizing problems, internalizing problems, school problems, adaptive skills, and behavioral symptoms, while parent responses provide standard scores for the same domains plus a sixth domain, activities of daily living, which assesses adaptive behavior. Each of the domains is comprised of several single-factor subscales. There are a total of 24 single-factor subscales on the BASC-2. Factor analysis was used to establish item and scale selection. Scores for the domain scales as well as the single-factor subscales are displayed as *T*-scores ($M = 50$, $SD = 10$). The authors suggest a cutoff for clinical significance of $T \geq 70$, with scores of 60–69 considered to fall in the “at risk” range for the development of clinically significant problems. The

externalizing problems domain scale was included in the present study. Subscales used in the present study include attention problems, hyperactivity, and aggression.

The BASC-2 is a well-established, widely used instrument in clinical child assessment and research with established norms for several age groups. Reynolds and Kamphaus (2004) determined that both the parent and teacher rating forms of the BASC-2 demonstrate strong concurrent validity with other child behavior rating scales. On the parent rating form, internal consistency coefficients for the general norms ranged from .89 to .94 and one-week test-retest reliability ranged from .77 to .91. On the teacher rating form, internal consistency coefficients for the general norms ranged from .87 to .97 and one-week test-retest reliability ranged from .84 to .90. The BASC-2 has also been found to have strong content, construct, and criterion validity.

Conners-March Developmental Questionnaire

The Conners-March Developmental Questionnaire (CMDQ; Conners & March, 1996) is a developmental history questionnaire for parents/caregivers of children ages 3–17 years. The questionnaire takes approximately 20 minutes to complete. The CMDQ was developed to provide sociodemographic information on areas including but not limited to: presenting problem, child race, family socioeconomic status, child temperament, child educational and developmental history, current medication use, birth/medical history, and psychiatric history for the child and child's family. Demographic information (e.g., family income, ethnicity, child age) was obtained from the CMDQ. This measure, as well as information solicited during the clinical interview, was also used to determine presence or absence of informant mental health diagnosis.

Academic Performance Rating Scale

Teachers completed an abbreviated version of the Academic Performance Rating Scale (APRS; DuPaul, Rapport, & Perreillo, 1991). The APRS provides information about the quality

of a student's academic performance and behavior in educational settings. Teachers are asked to estimate the percent of completed written math work and completed language arts work as well as the accuracy of the work for each subject. In the present study, math accuracy and completion were averaged to create a variable to represent math performance, and language arts accuracy and completion were averaged to create a variable to represent language arts performance. Math performance and language arts performance were later combined into a single academic performance variable by taking the average of the two variables.

Parenting Relationship Questionnaire

The Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006) is a measure of the parent or caregiver's perspective of the quality of the parent-child relationship. This measure is intended for use in a clinical population to better inform treatment. The questionnaire can be administered to parents of children ages 2 to 18 years old and takes approximately 10–15 minutes to complete. The PRQ assesses several dimensions of the parent-child relationship, including attachment, communication, discipline practices, involvement, parenting confidence, satisfaction with school, and relational frustration. The attachment, involvement, and relational frustration dimensions were used in the present study. The attachment domain is a measure of the affective, behavioral, and cognitive relationship between parent and child that results in parental feelings of closeness, empathy, and understanding of the child. The involvement domain measures the extent to which a parent and child participate together in a variety of common activities and the parent's knowledge of the child's activities. The relational frustration domain measures the parent's level of stress or distress in relating to and controlling the behavior and affect of the child, as well as the tendency to overreact and become frustrated in common parenting situations.

The measure is comprised of 71 items that are rated on a four-point Likert-type scale (never, sometimes, often, almost always). The raw scores for each scale are converted into *T*-scores and percentiles based on the normative sample. The measure was normed using a sample of 4,130 children and adolescents between the ages of 2 and 18 years. The sample was constructed to represent the U.S. population with respect to sex, SES (as indicated by parental education), race/ethnicity, geographic region, and classification in special education programs. *T*-scores that fall below 41 on each scale are considered below average and suggest difficulty within that area of the parent-child relationship. Scores ranging from 31–40 fall in the “at risk” range and scores below 31 fall in the clinically significant range. *T*-scores for the relational frustration scale are scored in the reverse direction, with scores ranging from 60–69 considered “at risk” scores and scores of 70 and above considered to be clinically significant. The PRQ also contains two indices for measuring the validity of responses. Normative groups are based on the child’s sex and age as well as the sex of the rater.

The PRQ is both reliable and valid. Internal consistency reliability has been found to be fairly high, with median scores ranging from .82 to .87. Test-retest reliability over approximately three weeks ranged from .75 to .89. Convergent validity was examined by comparing the correlations of the PRQ with three other parent-child relationship instruments. During the standardization process, parents of children with ADHD (as compared to parents of children with other diagnoses) reported the lowest levels of attachment and involvement and the second-highest level of relational frustration. Parents of children with emotional or behavioral problems reported the highest level of relational frustration.

Parenting Stress Index - Short Form

The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) was completed by parents/caregivers to measure parental/caregiver perceived stress levels. The PSI-SF consists of 36 items that are rated on a five-point Likert-type scale and takes approximately 5 to 10 minutes to complete. The PSI-SF is a modified and shortened version of the original Parenting Stress Index (PSI; Abidin, 1983). The PSI is based on normative data from a sample of 534 mothers and 522 fathers stratified to match the demographic composition of the 2007 U.S. Census. Raw scores are transformed to percentiles based on the normative sample, with scores falling above the 90th percentile considered clinically significant.

Exploratory factor analysis of the original PSI revealed three factors that were then incorporated in the PSI-SF: Difficult Child, Parent Distress, and Parent-Child Dysfunctional Interaction. Abidin (1995) reported that Total Stress scores on the PSI correlated highly with PSI-SF total (.94). Similarly, the Parent Domain on the PSI correlated highly with Parental Distress scale on the PSI-SF (.92) and the Child Domain on the PSI correlated highly with the Difficult Child scale on the PSI-SF (.87). Individual items were selected from the Parent Domain and the Child Domain scales on the PSI through exploratory factor analysis to create a unique scale on the PSI-SF, Parent-Child Dysfunctional Interaction, that demonstrated a .73 correlation with the PSI Child Domain and .50 with the PSI Parent Domain. The PSI-SF has become a widely used instrument in the assessment of parenting stress, with demonstrated reliable and valid psychometric properties in a variety of clinical populations, including populations with low socioeconomic status (e.g., Whiteside-Mansell et al., 2007), diverse ethnicity (e.g., Reitman, Currier, & Stickle, 2002), and with externalizing, internalizing, and autism spectrum disorders

(Zaidman-Zait et al., 2010). The present study used the PSI-SF Total Score as a measure of parenting stress.

Procedure

Children are typically referred to the ADHD evaluation clinic by their parent, teacher, or primary care physician due to concerns related to attention or hyperactivity/impulsivity. Following referral for the evaluation, the child and his or her parent or guardian are scheduled for a two-hour evaluation and teacher materials, including the BASC-2 teacher rating form and the APRS, are mailed to the parent to give to the teacher. In addition to questionnaires, teachers are given a form explaining the purpose of the evaluation as well as consent from the parent giving teachers permission to return the completed questionnaires to the clinic. Evaluations are completed by a graduate-level clinician and/or licensed psychologist and include a semi-structured diagnostic interview with the parent or guardian, brief measures of cognitive ability and academic achievement, and a computer-based test of attention given to the child. Parent questionnaires include the PRQ, PSI, and BASC-2 parent rating form, and most often are completed by the child's mother on the day of the evaluation. As mentioned, teacher questionnaires include the BASC-2 and APRS. The parent or legal guardian completed the questionnaires used in the present study as part of the standard assessment battery.

Parents or legal guardians provided informed consent for services prior to evaluation at the ADHD Evaluation Clinic. Informed consent was also obtained for the use of assessment data for the purpose of research. Only data from evaluations in which parents or guardians completed the consent for research participation was used in the present study. Each participant was given a unique subject identification number and all data were entered using this number. All documents containing client identifying information are secured in a locked filing cabinet contained in a

locked office within the clinic. The present study used archival data collected over a period of approximately six years (2012–2018).

The archival data used in the present study were entered into an SPSS data file by graduate and undergraduate research assistants who completed Institutional Review Board training and were given additional supervision and training by the ADHD Evaluation Clinic Director. The data were entered into a password-protected computer that is located in a locked office in the clinic. All assessment data collected in the ADHD Evaluation Clinic was protected according to the requirements of the Health Insurance Portability and Accountability Act of 1996.

CHAPTER 4

RESULTS

Plan of Analysis

Descriptive statistics are presented to describe the demographic characteristics of the sample, including the child's age, sex, and ethnicity, and annual family income. Correlations between the predictor variables are then presented. Hierarchical regression analyses were used to examine the relative contribution of each of the predictor variables on parent-teacher discrepancies on the externalizing problems composite scale of the BASC-2, as well as the hyperactivity, aggression, and attention problems subscales. Discrepancies on the hyperactivity and attention problems scales of the BASC-2 were considered to examine the final hypothesis, which states that factors found to predict differences in externalizing behavior would also predict differences in ADHD behaviors specifically. Finally, differences in parent and teacher ratings on the aggression subscale were examined, as previous research has shown that child oppositional behavior has a strong effect on parenting stress (e.g., Anastopoulos, Guevremont, Shelton, & DuPaul, 1992) which was hypothesized to be one of the strongest predictors of discrepancies.

For each of the four regressions, the first step consisted of demographic variables, including child age, ethnicity, income, and informant mental health. The second step of the regressions included informant self-reported variables, including parenting stress and three parent-child relationship variables (attachment, involvement, and relational frustration.) The final

step of the regressions consisted of school variables, including the length of time the teacher has known the child and academic performance.

Descriptive Analyses

Several variables were examined as potential predictors of differences in parent and teacher ratings on the BASC-2 scales including: child age, family income, child ethnicity, informant mental health, parent ratings on the PRQ (attachment, involvement, relational frustration), parenting stress, length of time the teacher has known the child, and academic performance. Tables 1 and 2 present the means and standard deviations for these variables. The means for both parent and teacher ratings of externalizing behavior problems on the BASC-2 were within the above average and “at risk” range, indicating that children are at risk for developing an externalizing behavior problem. The mean ratings for hyperactivity and attention problems were also in the above average and “at risk” range, whereas the means of the ratings for aggression were within the average range. The mean of the ratings for parenting stress was overall in the average range; however, there was a high degree of variability within the sample.

Correlational Analyses

A correlational analysis was conducted to examine the degree of relatedness among the 10 predictor variables. The strongest correlation was $r = .82$ between math performance and language arts performance, thus indicating an issue with multicollinearity (Cohen, Cohen, West, & Aiken, 2003). To address this issue, math performance and language arts performance were combined into a single academic performance variable. Correlations between the three PRQ ratings (i.e., attachment, involvement, relational frustration) ranged from .42 to .61, with the strongest correlation emerging between attachment and involvement, suggesting that parents that spend more time with their child also feel more connected to their child. Parenting stress was

significantly correlated with all three PRQ ratings (attachment: $p = -.53$, involvement: $p = -.52$, relational frustration: $p = .61$), indicating that parenting stress and parent perceptions of parent-child relationship quality are highly related. Family income was the only demographic factor that was correlated with parenting measures, with greater income associated with higher ratings of attachment and lower ratings of relational frustration and parenting stress. Income was also positively correlated with the length of time a teacher had known the child. This relationship may reflect a greater degree of stability among higher income households (i.e., higher income families are less likely to move), or could be related to lower income children being referred for evaluations closer to the beginning of the school year. Correlations between predictor variables are displayed in Table 3.

Regression Analyses

To measure the difference between parent and teacher ratings on the four BASC-2 scales, a raw difference score was calculated by subtracting the teacher rating from the parent rating. Consistent with recommendations based on previous research on informant discrepancies (De Los Reyes & Kazdin, 2004), a standardized difference score was also calculated (parent z-score minus teacher z-score). Regressions were conducted using the raw difference score as well as the standardized difference variables, and results of both regressions were generally the same. For ease of interpretation, regression results based on the raw difference scores are presented below.

Predicting Discrepancies in Ratings of Externalizing Problems

A hierarchical multiple regression analysis was conducted to examine parent-teacher discrepancies on the externalizing problems scale of the BASC-2 (Table 4). The first step of the model, entering child age, ethnicity, family income, and informant mental health, was significant and accounted for 7.7% of the variance. Child ethnicity and family income emerged as

significant individual predictors. Greater discrepancies were found for ratings of children from lower income families. Considering child ethnicity, the beta value was also negative, indicating that for ethnic minority children, the value of the difference score was in the negative direction. Results of a t-test grouping by yes/no minority ethnicity status revealed that teachers tended to endorse more externalizing behavior for ethnic minority children (see Supplemental Analyses below), which likely contributed to the negative beta value for ethnicity. However, when considering the absolute value of parent-teacher differences in ratings of externalizing behavior, child ethnicity was not a significant predictor, thus indicating that ethnicity is not a predictor of the magnitude of differences in parent and teacher ratings. Rather, child ethnicity emerged as a significant predictor due to teachers tending to endorse more externalizing behavior (and specifically more aggressive behavior) for ethnic minority versus Caucasian children. Informant mental health approached the .05 level of significance ($p = .06$), such that greater parent-teacher discrepancies were found in children of informants with a reported mental health problem.

The second step of the model, which included PRQ subscales (attachment, involvement, and relational frustration) and parenting stress measured by the PSI, was also significant and accounted for an additional 20.0% of the variance, yielding a total of 27.7% of the variance accounted for by these eight variables. Relational frustration and parenting stress emerged as significant individual predictors. Greater discrepancies were found for ratings of children whose parents reported higher levels of relational frustration as well as higher levels of parenting stress, with parents reporting more externalizing behavior problems than teachers. In addition, ethnicity approached significance ($p = .06$). Family income and informant mental health were no longer significant predictors in this model.

The third step of the model, entering the length of time the teacher had known the child and child academic performance, was also significant and accounted for an additional 2.1% of the variance, yielding a total of 29.8% of the variance accounted for by these 10 variables. At this step, relational frustration and parenting stress continued to emerge as significant individual predictors. Ethnicity continued to trend toward significance ($p = .06$). Additionally, academic performance approached significance ($p = .06$), with greater agreement for ratings of children with lower academic performance.

Predicting Discrepancies in Ratings of Hyperactivity

A second hierarchical multiple regression analysis was conducted to examine parent-teacher discrepancies on the hyperactivity scale of the BASC-2 (Table 5). The first step of the model, entering child age, ethnicity, family income, and informant mental health, was significant and accounted for 6.0% of the variance. Family income emerged as the only significant individual predictor, with greater discrepancies found for ratings of children from lower income families. Informant mental health emerged as a trend toward significance ($p = .10$), such that children of informants with a reported mental health problem rated rating children higher in hyperactivity than teachers.

The second step of the model, which included PRQ subscales (attachment, involvement, and relational frustration) and parenting stress measured by the PSI, was also significant and accounted for an additional 12.3% of the variance, yielding a total of 18.3% of the variance accounted for by these eight variables. Parenting stress emerged as a significant individual predictor, and relational frustration approached significance ($p = .06$). Greater discrepancies were found for ratings of children whose parents reported higher levels of relational frustration as well

as higher levels of parenting stress. Family income and informant mental health were no longer significant predictors in this model.

The third step of the model, entering the length of time the teacher has known the child and child academic performance, was also significant and accounted for an additional 3.4% of the variance, yielding a total of 21.7% of the variance accounted for by these 10 variables. At this step, parenting stress continued to emerge as a significant individual predictor and relational frustration continued to approach significance ($p = .06$). Child academic performance also emerged as a significant individual predictor, with greater discrepancies for ratings of children with higher academic performance. The length of time that the teacher has known the child trended toward significance ($p = .10$), with greater discrepancies for ratings of children whom the teacher has known for less time.

Predicting Discrepancies in Ratings of Attention Problems

A third hierarchical multiple regression analysis was conducted to examine parent-teacher discrepancies on the attention problems scale of the BASC-2 (Table 6). The first step of the model predicting parent-teacher discrepancies in ratings of attention problems, entering child age, ethnicity, family income, and informant mental health, was significant and accounted for 5.1% of the variance. Family income was a significant individual predictor, with greater discrepancies for ratings of children from lower income families. Child age approached significance ($p = .06$), with greater discrepancies for ratings of younger children.

The second step of the model, which included PRQ subscales (attachment, involvement, and relational frustration) and parenting stress measured by the PSI, was also significant and accounted for an additional 4.3% of the variance, yielding a total of 9.4% of the variance accounted for by these eight variables. None of the individual variables were significant at this

step of the model. Family income approached significance ($p = .08$), and child age continued to approach significance ($p = .08$).

The third step of the model, entering the length of time the teacher has known the child and child academic performance, was also significant and accounted for an additional 4.3% of the variance, yielding a total of 13.7% of the variance accounted for by these 10 variables. At this step, academic performance emerged as a significant predictor of discrepancies, with greater parent-teacher discrepancies for children with higher academic performance. Income was also significant, with greater discrepancies for ratings of children from lower income families. Child age continued to approach significance ($p = .07$). Additionally, parenting stress emerged as a trend ($p = .07$), such that greater discrepancies were found for ratings of children whose parents reported higher levels of parenting stress.

Predicting Discrepancies in Ratings of Aggression

A fourth regression examined parent-teacher discrepancies on the aggression scale of the BASC-2 (Table 7). The first step of the model, entering child age, ethnicity, family income, and informant mental health, was significant and accounted for 9.1% of the variance. Family income and child ethnicity were significant, with greater discrepancies for ratings of children from lower income families and in ratings of ethnic minority children as compared to Caucasian children. Considering child ethnicity, as noted above, teachers tended to endorse more aggressive behavior for ethnic minority children versus Caucasian children based on results of t-tests (see Supplemental Analyses below); however, when predicting the absolute value of parent-teacher differences in ratings of aggressive behavior, child ethnicity was not a significant predictor. Thus, child ethnicity did not significantly predict the extent of differences in parent versus teacher ratings. Additionally, informant mental health was a significant individual predictor, such

that children of informants with a reported mental health problem rated rating children higher in aggression as compared to teachers. Child age approached significance ($p = .09$), with greater discrepancies for ratings of older children.

The second step of the model, which included PRQ subscales (attachment, involvement, and relational frustration) and parenting stress measured by the PSI, was also significant and accounted for an additional 13.2% of the variance, yielding a total of 22.3% of the variance accounted for by these eight variables. Relational frustration emerged as a significant predictor, and parenting stress trended toward significance ($p = .07$). Greater discrepancies were found for ratings of children whose parents reported higher levels of relational frustration as well as higher levels of parenting stress. Child ethnicity also remained as a significant predictor and child age continued to approach significance ($p = .06$).

The third step of the model, entering the length of time the teacher had known the child and child academic performance, was also significant and accounted for an additional 2.4% of the variance, yielding a total of 24.7% of the variance accounted for by these 10 variables. At this step, child ethnicity and relational frustration continued to be significant individual predictors. Child age and parenting stress also emerged as significant predictors. Neither of the school-related predictors (i.e., length of time teacher had known the child, child academic performance) was significant for this model.

Supplemental Analyses

A t-test was conducted to examine the differences in informants' ratings of parenting stress among informants who reported having a mental health problem as compared to those who did not. Results were significant, $t(174) = 3.32, p = .001$. The mean parenting stress rating of the 58 informants who reported having a mental health problem ($M = 59.41, SD = 27.18$) was

significantly higher than the mean rating of the 118 informants who did not report a mental health problem ($M = 44.97$, $SD = 27.16$). Additionally, it was found that parents with a mental health history tended to report more child hyperactivity and more externalizing problems than did teachers. Considering these results together, it may be that parent mental health history contributes to greater parenting stress, which in turn predicts greater discrepancies in parent-teacher ratings. When predicting the absolute value of parent-teacher differences in ratings of externalizing behavior, as well as hyperactive behavior specifically, informant mental health was not a significant predictor, further suggesting that informant mental health alone does not predict parent-teacher discrepancies in ratings. Rather, informant mental health emerged as a significant individual predictor of discrepancies in the first step of the regression due to the direction of the differences (i.e., parent higher than teacher), as well as the greater range of difference scores when using the raw difference score as compared to the absolute value score.

To better understand differences associated with child academic performance, t-tests were conducted to examine parent-teacher discrepancies for both hyperactivity and inattention. Children were grouped into two groups (high versus low academic performance) using a median split. Results of the t-test were significant for both hyperactivity, $t(180) = -2.19$, $p = .03$, and for inattention, $t(179) = -2.68$, $p < .01$. For hyperactivity, the mean difference score for children in the high academic performance group ($M = 4.58$, $SD = 16.48$) was significantly greater than for children in the low academic performance group ($M = -.71$, $SD = 16.01$). Similarly, for attention problems, the mean difference score for children in the high academic performance group ($M = 6.12$, $SD = 10.71$) was significantly greater than for children in the low academic performance group ($M = 2.02$, $SD = 9.76$).

In order to further examine the differences in ratings of Caucasian versus ethnic minority children for externalizing behavior, aggression, hyperactivity, and attention problems, t-tests were conducted grouping by yes/no minority ethnicity. Results of the analyses revealed no significant differences for Caucasian versus ethnic minority children considering parent-teacher discrepancies in ratings of hyperactivity and attention problems ($p > .57$). Parent-teacher discrepancies for ratings of aggression were significant, $t(182) = 2.10, p = .04$, with greater differences in ratings for ethnic minority children ($M = -7.47, SD = 17.00$) versus Caucasian children ($M = 1.92, SD = 17.70$). The negative value of the mean difference score for ethnic minority children indicates that teachers tended to endorse more aggressive behavior as compared to parents. Discrepancies for ratings of externalizing problems trended toward significance, $t(182) = 1.84, p = .07$, with greater differences for minority children ($M = -4.42, SD = 13.75$) as compared to Caucasian children ($M = 3.45, SD = 17.02$). Similar to ratings for aggressive behavior, the negative value of the mean difference score for ethnic minority children indicates that teachers tended to report more externalizing behavior problems as compared to parents. In contrast, parents of Caucasian children tended to report more externalizing behavior as compared to teachers.

CHAPTER 5

DISCUSSION

It has been consistently demonstrated that informant reports of child behavior correlate in the low to moderate range (Achenbach et al., 1987; De Los Reyes et al., 2015). Several studies have evaluated a variety of factors that contribute to these discrepancies (e.g., De Los Reyes & Kazdin, 2005); however, only a few studies have examined these variables in combination (i.e., Connolly & Vance, 2010; Takeda et al., 2016), and most have not considered ratings for both inattention and hyperactive behavior or examined the relative influence of each predictor on rater discrepancy. The present study adds to the current literature by examining the relative contributions of a number of predictors with varying levels of empirical support on parent-teacher discrepancies in reports of child externalizing behavior (hyperactivity, aggression), as well as inattentive behavior. These factors included a variety of demographic (i.e., age, ethnicity, income, parent psychopathology), parenting (i.e., parenting stress, parent-child relationship), and academic (i.e., length of time teacher had known child, academic performance) variables that are hypothesized to contribute to parent-teacher discrepancies. Overall, the parenting variables included in the analyses tended to be the strongest predictors in discrepancies of parent and teacher ratings. In particular, parenting stress was a significant predictor in the regression analyses predicting discrepancies for externalizing behavior problems, hyperactivity, and aggression, and emerged as a trend for attention problems, with higher parenting stress

associated with higher parent than teacher endorsement of behavior difficulties. Parent ratings of relational frustration, which reflects conflict in the parent-child relationship, was associated with greater parent than teacher endorsement for aggressive behavior and overall externalizing behavior, likely reflecting differences in child behavior at home versus at school, associated with parent-child conflict. It should be noted that the parenting variables were likely found to be the strongest predictors, in part, due to the influence of having the same rater (parent) and same method (rating scale) as the independent variables (i.e., parent-teacher difference scores based 50% on parent ratings). Results of the regression predicting attention problems differed from the other regressions in that the family income and child academic performance variables, rather than the parenting variables, were found to be the strongest predictors of parent-teacher discrepancies. Thus, it appears that parenting variables have a stronger influence in ratings of externalizing behavior as compared to attention problems.

Influence of Demographic Variables

It was predicted that child age and ethnicity, family income, and parent psychopathology would be significant predictors of discrepancies in parent and teacher ratings of child externalizing behavior. Child age was not found to be a significant predictor of parent-teacher discrepancies of externalizing behavior problems or hyperactivity, more specifically; however, it was found to be a significant predictor for ratings of aggression, with greater agreement found among ratings of younger children, and a trend was noted for ratings of attention, with greater agreement found among ratings of older children. One explanation for the finding regarding aggression is that aggressive behavior becomes less outwardly observable as children age, so older children may not exhibit the same degree of aggressive behavior across settings as compared to younger children. Furthermore, aggression tends to move from more direct forms

(e.g., physical aggression) to indirect forms (e.g., relational aggression) as children age (Björkqvist, Lagerspetz, & Kaukiainen, 1992), which may be more difficult to observe. Considering attention problems, greater discrepancies were found for ratings of younger children. Results of correlational analyses revealed that parents tended to report more attention problems for younger children ($r = -.16, p < .05$), whereas there was no significant relationship between child age and ratings of attention problems for teachers ($r = .04, p = .59$). Thus, the greater discrepancies for ratings of attention problems among younger children appear to be driven by parent reports of greater attention problems among younger children. A possible explanation for these results could be that teachers perceive some extent of attention difficulties as normative for younger children based on their training in child development and experience with children (Berg-Nelsen et al., 2012), whereas parents may consider their child's attention problems to be greater than what could be expected to be developmentally-appropriate.

Child ethnicity was found to be a significant predictor of discrepancies in ratings of externalizing behavior problems when considering only demographic variables; however, when other factors were included (i.e., parenting and academic variables), ethnicity emerged as a trend toward significance. As noted above, child ethnicity emerged as a predictor primarily due to a tendency for teachers to rate more aggressive behavior for ethnic minority as compared to Caucasian children. There was not a significant difference, based on results of t-tests grouping by child ethnicity, in parent versus teacher ratings for hyperactive behavior, overall externalizing behavior, or attention problems. Also as noted, when predicting the absolute value of parent-teacher differences in aggressive behavior (and externalizing behavior), ethnicity was not a significant predictor. Thus, child ethnicity does not predict the extent of parent-teacher differences in ratings of aggression, but does predict the direction (with teachers endorsing more

aggressive behavior than parents). This finding is consistent with previous research (e.g., De Los Reyes & Kazdin, 2005), which has generally found greater agreement for ratings of Caucasian children as compared to ethnic minority children. Previous research (e.g., Harvey et al., 2013; Youngstrom et al., 2000) has also found that teachers tend to report more behavior difficulties for ethnic minority children as compared to parent ratings. For example, Zimmerman, Khoury, Vega, Gil, and Warheit (1995) found that African American students received higher behavior problem scores from their teachers than from their parents, and they were more likely than Hispanic and Caucasian students to be classified as exhibiting clinically significant concerns by their teachers as compared to parents. This finding was true regardless of the teacher's ethnicity, leading the authors to suggest the possibility that higher teacher ratings for behavior problems may reflect situation specificity, rather than rater bias (i.e., African American students displayed greater problem behavior at school as compared to home). Other studies support a rater bias perspective. For example, Neal, McCray, Webb-Johnson, and Bridgest (2003) examined the effects of middle school students' movement styles (i.e., walking) on teachers' ratings of student achievement, aggression, and need for special education. The authors found that teachers perceived students with African American culture-related walking styles as lower in achievement, higher in aggression, and more likely to need special education services than students with standard movement styles. Future research should aim to replicate findings from the present study using a sample with a greater representation of ethnic minority children to further understand the relationship between child ethnicity and ratings of child behavior.

Consistent with previous research (e.g., De Los Reyes & Kazdin, 2005; Lederberg-Stone et al., 2013), family income was found to be a significant predictor of discrepancies in all four models when considering only the four demographic variables, such that greater discrepancies

were found for ratings of children from lower income families. For three of the four models, family income was no longer significant after accounting for the four parenting variables, most likely due to the relationship between ratings on the parenting variables and family income. For example, family income was significantly correlated with parent-child attachment ($r = .20$), relational frustration ($r = -.20$), and parenting stress ($r = -.19$). Future research using path modeling could explore the possible mediating or moderating influence of parenting variables on the relationship between family income and parent-teacher discrepancies. Family income remained a significant predictor in the final model for attention problems, likely due in part to the weaker correlation between relational frustration and parent-teacher difference scores in ratings of attention problems ($r = .21$) as compared to externalizing problems ($r = .36-.46$). Additionally, family income was significantly (and positively) correlated with the length of time the teacher had known the child. Consequently, this variable acted as a suppressor in the third step of the regression, thus increasing the significance of income in the final model. Other researchers (e.g., Treutler & Epkins, 2003) have noted that conflict in the parent-child relationship impacts parent perceptions, and consequently parent ratings, of child behavior. Overall, parents from lower income families appear to report more symptoms for both externalizing problems and attention problems, perhaps reflecting a tendency to report more symptoms in an effort to obtain assistance and resources for their children. Alternatively, children living in lower income households may display greater behavior difficulties and attention problems, associated with greater stress and access to fewer resources as compared to children living in higher income households.

Informant mental health emerged as a significant predictor for discrepancies in ratings of aggression, and a trend was noted in ratings of hyperactivity and overall externalizing behavior

in the first step of the models. Similar to the findings for child ethnicity, parents with a mental health diagnosis tended to endorse more child behavior problems as compared to teacher ratings. As noted above, results of t-tests revealed that parents with a mental health problem reported more parenting stress as well as more hyperactive, aggressive, and overall externalizing behavior problems as compared to parents not reporting a mental health problem (see Supplemental Analyses section). However, when predicting the absolute value of parent-teacher differences, informant mental health was not a significant predictor in any of the models. Thus, informant mental health does not predict the extent of parent-teacher discrepancies in ratings of child behavior. Considering these results together, it may be that parenting stress mediates the relationship between parent mental health and parent ratings of child behavior. Another theory is that parents who experience a mental health problem experience distorted perceptions of their children's behavior. This theory is consistent with the depression-distortion hypothesis, in which a parent with depression and higher levels of distress may experience altered perceptions, which would impact their abilities to provide an objective evaluation of their child's behavior (Chi & Hinshaw, 2002). Similarly, previous research has found that parents with a diagnosis of ADHD tend to report greater child problem behavior as compared to parents without ADHD (Yeguez & Sibley, 2016). Alternatively, children of parents with a mental health problem may exhibit a greater occurrence of hyperactive and/or aggressive behavior, perhaps in response to parent mental health issues (Harvey et al., 2011). Both explanations would differentially affect parent versus teacher ratings of child behavior.

Influence of Parenting Variables

When considering parent-child relationship variables, it was predicted that lower levels of attachment and involvement and higher levels of relational frustration would be associated with

greater parent-teacher discrepancies. Consistent with predictions, relational frustration emerged as a significant predictor of discrepancies in overall externalizing behavior problems, as well as ratings of aggression. Additionally, a trend was noted for relational frustration as a predictor for discrepancies in ratings of hyperactivity. For all three models predicting externalizing behavior, greater discrepancies were found for ratings of children whose parents report greater levels of relational frustration. These findings may suggest that more conflict in the parent-child relationship influences parent perceptions of greater externalizing problems in their children. Alternatively, consistent with the situation-specificity hypothesis, some children may display greater externalizing behavior problems at home versus school, contributing to greater discrepancy as well as greater parent-child conflict. Relational frustration was not a significant predictor in ratings of attention problems, suggesting that externalizing behavior problems may contribute to greater strain in the parent-child relationship as compared to attention problems. Previous research has found that child ODD symptoms contribute more to conflict in the parent-child relationship as compared to hyperactivity or inattention (Green, Stanley, & Peters, 2007). In the present study, parenting variables, particularly relational frustration, were the strongest predictors for the regression predicting parent-teacher differences on the aggression scale, which measures a child's oppositional tendencies. Contrary to predictions, attachment and involvement were not found to be significant predictors of parent-teacher discrepancies. Parent ratings of attachment (i.e., ability to sense the child's mood and provide comfort) and involvement (i.e., spending time together) reflect both the quality and quantity of parent-child interactions. It is possible that parents reporting lower levels of attachment and involvement have fewer opportunities to observe their child's behavior, making their ratings more similar to teachers who observe child behavior primarily in only one context (i.e., classroom).

Consistent with previous studies (Langberg et al., 2010; Van der Oord et al., 2006), it was predicted that parenting stress would be a significant predictor of parent-teacher discrepancies, with greater discrepancies for informants who report greater degrees of parenting stress. It was also predicted that parenting stress would be one of the strongest predictors based on previous research (Dell, 2013). As hypothesized, parenting stress was found to be a significant predictor of discrepancies in ratings of child externalizing behavior broadly, as well as ratings of hyperactivity and aggression specifically; parenting stress approached significance as a predictor of discrepancies in ratings of attention problems. Yeguez and Sibley (2016) found that parenting stress was the only significant predictor of parent-teacher discrepancies for all three child ADHD variables assessed (i.e., inattentive symptoms, hyperactive/impulsive symptoms, academic problems) and was associated with the most severe symptom reports by mothers. The results of the present study add to the growing body of literature that supports a strong relationship between parenting stress and informant discrepancies in ratings of child behavior; however, the specific process by which this relationship exists remains unclear. Similar to the depression-distortion hypothesis discussed by Chi & Hinshaw (2002), parents who experience greater stress may experience distortions in their perceptions of their child's behavior, leading to inflated ratings of child behavior problems. It is also possible that greater parent versus teacher ratings of child behavior reflect greater child behavior problems at home versus school, which then leads to a greater degree of parenting stress.

Results of a supplemental analysis revealed that the average parenting stress rating of the informants who reported having a mental health problem was significantly higher than the average rating of the informants who did not report a mental health problem. Previous research (e.g., Langberg et al., 2010; Van der Oord et al., 2006) has found parenting stress, but not

depression, to predict rater discrepancies when examining the relative influence of both variables. Anxiety and/or depression were the most common mental health conditions reported by parents in the present study. Parent experience of anxiety or depression is likely to contribute to parenting stress, as these parents likely have more difficulty performing parent-related duties than parents who do not experience mental health issues. Likewise, parents who experience greater than average parenting stress on a regular basis, perhaps associated with having a child with behavioral difficulties, are more likely to experience feelings of depression or anxiety (Theule, Wiener, Rogers, & Marton, 2011). Thus, as mentioned above, further research is needed to explore the possibility that parenting stress mediates the relationship between parent mental health and ratings of child behavior.

Influence of Academic Variables

Based on previous findings (i.e., Takeda et al., 2016), it was predicted that there would be greater parent-teacher discrepancies in externalizing behavior for children rated by their teacher as having more academic difficulties as compared to children rated as having less academic difficulties. Academic performance approached significance as a predictor of externalizing behavior; however, contrary to predictions, greater discrepancies were associated with higher academic performance. Additionally, academic performance emerged as a significant predictor of discrepancies in ratings of hyperactivity and attention problems, but not aggression. Parent-teacher discrepancies for ratings of children with higher academic performance (based on median split) had a mean parent-teacher difference score of over six points for attention problems and over four points for hyperactivity (with parents tending to report more externalizing behavior problems than teachers), whereas parent versus teacher ratings of children with lower academic performance differed by just over two points for attention problems and less than one point for

hyperactivity. Although little research has been conducted examining the influence of academic performance on informant discrepancies, results of this study are not consistent with previous findings. For example, Deng et al. (2004) found greater parent-teacher discrepancies for ratings of attention problems among children with lower academic performance in a sample of Chinese school-aged children. The authors suggest that parents and teachers may be more likely to ignore a child's behavioral and emotional problems if the child performs well in school because Chinese parents and teachers evaluate a student largely based on academic performance. It is possible that in the present study, teacher ratings were more focused on the influence of child inattentive and hyperactive behavior on academic performance, whereas parent ratings considered other areas of impairment (e.g., relationships with others, participation in organized activities) in addition to academics. Consequently, students with higher academic performance may be rated by their parents as having greater behavior problems than teachers, as parent ratings reflect impairment in other areas of the child's life.

It was also predicted that the length of time that the teacher had known the child would predict parent-teacher discrepancies, with longer time known predicting higher levels of parent-teacher agreement. This hypothesis was not supported for externalizing behavior, aggression, or attention problems; however, length of time known child trended toward significance for discrepancies in ratings of hyperactivity, with greater agreement associated with longer contact with the child. One explanation for this finding is that teachers who have known their students for longer periods of time have had more opportunities to observe their behavior in a variety of settings (e.g., classroom, recess, lunch), making their ratings more similar to parents, who also observe child behavior across many settings.

Other Findings

Based on previous research considering family factors in explaining parent-teacher discrepancies in ratings of child behavior (e.g., Dell, 2013), it was predicted that parenting stress and family income would be the strongest predictors of parent-teacher discrepancies in ratings of externalizing behavior. As predicted, parenting stress was found to be a strong predictor for externalizing behavior. In fact, parenting stress emerged as either a significant predictor or a trend across all four regressions and was therefore the most consistent predictor of parent-teacher discrepancies. Family income was found to be a significant predictor in the final model predicting discrepancies in attention problems, and it emerged as a significant predictor of discrepancies in externalizing behavior problems, hyperactivity, and aggression when considering only the influence of demographic factors. Family income was significantly correlated with relational frustration and parenting stress. As previously mentioned, it is possible that the influence of family income on the quality of the parent-child relationship, particularly relational frustration and parenting stress, is such that parents of lower income families experience more stress overall in terms of meeting a child's needs, and this stress in turn contributes to more frustration in the relationship.

The final hypothesis predicted that the factors found to be significant predictors of parent-teacher discrepancies in ratings of externalizing behavior would also be significant predictors of parent-teacher discrepancies in ratings of ADHD behavior specifically. This hypothesis was partially supported. Parenting stress, which was found to be a significant predictor of discrepancies in ratings of externalizing problems, was also found to significantly predict discrepancies in hyperactivity and emerged as a trend in ratings of attention problems. Relational frustration, which was also found to be a significant predictor of discrepancies in

ratings of externalizing problems, emerged as a trend for hyperactivity and was not a significant predictor of discrepancies in ratings of attention problems. As mentioned, previous research has found that externalizing behavior, and particularly oppositional behavior, has a greater impact on the parent-child relationship than attention problems (Green et al., 2007). Shaw, Owens, Giovannelli, & Winslow (2001) found that boys who had comorbid ADHD and ODD/CD had mothers who were observed to be more rejecting than mothers of children with ADHD or no behavior problems. Similarly, Gomez and Sanson (1994) observed mother-child interactions in school-aged children with ADHD, ADHD and conduct problems, and non-problem groups, and found that mothers in the comorbid group were the most negative and least rewarding, whereas mothers of children with ADHD or no issues did not differ in their level of negativity. Results of the present study are consistent with these findings, suggesting that relational frustration is more strongly related to externalizing behavior, particularly aggressive behavior, than attention problems.

Clinical Implications

This study considered the relative influence of both known and lesser-researched predictors of parent-teacher discrepancies in ratings of child behavior. Consistent with two large meta-analyses (Achenbach et al., 1987; De Los Reyes et al., 2015), the present study found significant discrepancies between parent and teacher ratings of child externalizing behavior problems, providing further support that discrepancies are the norm rather than the exception when rating child behavior. In over 50% of cases, parent and teacher ratings of externalizing behavior problems differed by over 10 points, which can reflect clinically significant differences in parent versus teacher perceptions of child behavior. The magnitude of these differences can

complicate the assessment process and highlights the need for further understanding of factors that influence these discrepancies.

Parenting stress and relational frustration, which have both been shown to significantly predict discrepancies (De Los Reyes & Kazdin, 2005; Kolko & Kazdin, 1993; Treutler and Epkins, 2003; Youngstrom et al., 2000), were found to be the strongest predictors of discrepancies across the four types of behaviors considered in this study. Given that these variables were the strongest predictors, clinicians evaluating child behavior problems should consider parenting stress and the quality of the parent-child relationship as factors likely to influence parent ratings of child behavior. More specifically, clinicians should consider that parents experiencing high levels of parenting stress might produce inflated ratings of child behavior problems, particularly when there is also strain in the parent-child relationship. Additionally, parenting stress and relational frustration have been found to be more strongly related to certain externalizing behaviors, such as aggression (Green et al., 2007). Thus, clinicians may wish to strongly consider the possibility of an ODD diagnosis, either in lieu or in combination with ADHD, when they note significant discrepancies in ratings of oppositional behavior, with parents endorsing greater behavioral problems.

Although the influence of demographic factors in the final models was minimal, family income was found to be a significant predictor in the final model predicting attention problems. In addition, results of t-tests revealed greater discrepancies in ratings of aggression for ethnic minority children as compared to Caucasian children, with teachers tending to report more aggression for ethnic minority children. Harvey et al. (2013) hypothesized that for some African American children, ADHD diagnoses could be driven largely by teachers' perceptions based on their findings that teachers tend to endorse higher levels of ADHD symptoms for African

American children as compared to parents. DuPaul, Power, Anastopoulos and Reid (2016) found that African American teachers rated Hispanic students higher in hyperactivity than non-Hispanic white students and that non-Hispanic white teachers provided lower ratings of hyperactivity as compared to African American and Hispanic teachers, thus suggesting that teacher ethnicity may also influence ratings of child behavior. If parents do not share the same perceptions or concerns as their child's teacher, they may not see the need to pursue treatment or evaluation. Although further research is needed to understand these differences, clinicians should consider the possibility that teachers may produce greater ratings for ethnic minority children than parents due to rater bias and/or greater behavior problems exhibited in the classroom setting as compared to at home. If parents do not report difficulties with their child's behavior, exploration of specific areas of impairment that may be more easily observed in the school versus home setting (e.g., academic performance, relationships with peers), may help clinicians and parents to understand whether these concerns are valid and warrant further intervention.

In the present study, greater discrepancies were found among lower income children, with parents reporting greater problems than teachers. Parents of lower income families have been found to experience greater levels of stress and depression (De Los Reyes & Kazdin, 2005; Harvey et al., 2013), which is associated with greater endorsement of child behavior problems. Also, as mentioned, parents of lower income families likely have fewer resources available for their children (e.g., additional academic support) and may, in turn, endorse greater levels of child behavior problems in an attempt to secure resources for their children. Thus, family income should be considered as a factor potentially influencing both parent perception and ratings of child behavior, as well as parent goals in the evaluation process. It may be helpful for clinicians working with low income families to thoroughly explain the evaluation process and its possible

outcomes prior to having parents complete rating scales, in an effort to reduce or minimize inflated ratings (i.e., parent believes that child will only get services if parent endorses extreme behavior difficulties).

Contrary to previous research, the present study found greater discrepancies for children with better academic performance. It is possible that if children do not display impairment in academic performance, teachers may be less likely to endorse problems with inattention or hyperactivity, as their primary opportunity to observe children's behavior occurs in the classroom setting. Parent ratings of inattention and hyperactivity, however, are based on daily interactions that occur in a variety of settings, as opposed to being limited only to observations of their child behavior during academic tasks. Thus, clinicians should be aware that teachers might minimize or be less likely to notice and report inattentive as well as perhaps hyperactive and impulsive behaviors among children that display strong academic performance.

Limitations and Future Research

One limitation to the present study is the lack of diversity among the participants. In this study, parent ratings were completed primarily by Caucasian mothers, with the majority reporting an income level below \$30,000. Further, it is estimated that the majority of teachers were also Caucasian females based on the demographics of the area in which the study was conducted. Previous studies have discovered meaningful differences between mother and father ratings of child behavior (Chi & Hinshaw, 2002; Langberg et al., 2010), as well as differences associated with child and/or informant ethnicity (De Los Reyes & Kazdin, 2005; DuPaul et al., 2016; Harvey et al., 2013), and SES (Achenbach, 1991; Lederberg-Stone et al., 2013). In the present study, ethnicity emerged as a significant predictor of discrepancy when considering only demographic variables; however, when other factors were included, ethnicity emerged as a trend

toward significance. With a larger sample of ethnic minority participants, it is likely that ethnicity would have emerged as a significant predictor of parent-teacher differences when including other, non-demographic variables. Future research should utilize a more diverse sample to better understand the influence of ethnicity on informant discrepancies as well as to allow for greater generalizability of the results.

Another potential limitation of the study is the moderate sample size. Although the sample size was sufficient in regard to power for the statistical analyses, a larger sample size may have resulted in a better ability to evaluate low frequency factors, such as minority ethnicity and informant mental health. Due to the lack of ethnic diversity in the sample, ratings for Caucasian children were compared to all non-Caucasian children. Harvey et al. (2013) found that the pattern of discrepancy (i.e., parent higher than teacher versus teacher higher than parent) varies across ethnicities and suggested that minority ethnicities should each be considered separately when understanding the effect of ethnicity on rater discrepancies. With a larger sample size, it may be possible to consider discrepancies for specific racial/ethnic groups (e.g., African American, Hispanic) as well as differences across groups. Similarly, due to the low number of parents/caregivers who reported having a mental health problem, all reported mental health issues were combined into a single variable and compared to parents who do not report a mental health problem. It is possible that different types of psychopathology may be more related to informant perceptions of child behavior than others, which cannot be determined when combining all types of mental health issues into one factor. Furthermore, in the present study, it is likely that informant mental health was not found to be a significant predictor of discrepancies due, in part, to the inclusion of parenting stress. Parenting stress was found to be a stronger predictor of discrepancies as compared to informant mental health, which could be attributed to

several factors. One explanation for this finding is that informant mental health was measured by self-report and combined into a yes/no variable, representing the presence or absence of a mental health problem, whereas parenting stress was evaluated using a measure with good psychometric support, making the variable more reliable and valid than the informant mental health variable. Another explanation is that parents were likely more honest in their disclosure of parenting stress compared to their disclosure of having a mental health problem due to the greater stigma associated with having a mental health problem as compared to experiencing parenting stress. Finally, both parenting stress and the four variables of interest were measured using self-report measures, and it would be expected that parent self-report measures would be highly correlated with one another. Despite these limitations, results of the present study, as well as previous research that has found parenting stress to be a stronger predictor than mental health (e.g., Langberg et al., 2010; Van der Oord et al., 2006) suggesting that parenting stress contributes more to rater discrepancies than informant mental health problems. As mentioned, future research may explore the possible mediating influence of parenting stress on the relationship between informant mental health and parent-teacher discrepancies.

The use of archival data was a limitation due to not being able to examine specific variables and theoretical frameworks that have been proposed in previous studies. In the present study, just under 30% of the variance in difference scores for externalizing behavior was explained by the ten predictors, thus indicating that there are other variables not considered in the present study that may explain differences in parent versus teacher ratings of child behavior. For example, the variance accounted for in regard to difference scores in ratings of aggression was fairly high (24.7%); however, the variance accounted for in difference scores in ratings of attention problems was much lower (13.7%). These findings suggest that the predictors

considered in the present study are important to consider when understanding discrepancies in ratings of aggression, but minimally account for differences in parent and teacher ratings of child attention difficulties. Several frameworks that have been proposed (e.g., De Los Reyes & Kazdin, 2005; Dumenci et al., 2011; Noordhof et al., 2008) emphasize the importance of context, as differences in the context in which parents and teachers observe the child's behavior exacerbate differences based on rater attributions and perspectives. For example, the model proposed by Dumenci and colleagues includes both contextual (i.e., behaviors specific to the context from the perspective of an informant) and cross-contextual (i.e., behaviors common across contexts and informants) components of hierarchical constructs to determine whether discrepancies are better explained by situation specificity or rater bias. The present study addresses part of the model by including school- and teacher-related variables to consider the influence of the school context on rater discrepancies; however, future research should include variables that represent ratings of a child's behavior in multiple settings and/or utilize methods of analysis that allow for greater focus on context. For example, informants could indicate the settings on which their ratings are based. Parent ratings may be based on both observation of child behavior at home as well as what they have heard about the child's behavior at school. Likewise, a teacher may base ratings on classroom behavior only or on classroom behavior and observations made during other times of the day (e.g., recess, lunch).

The statistical procedure used in this study is also a potential limitation. Parent-teacher discrepancies were measured using raw difference scores. The use of raw difference scores to understand informant discrepancies is a commonly used method and is not inherently unreliable (De Los Reyes et al., 2011; Laird & Weems, 2011). However, Laird and De Los Reyes (2013) advise against the use of raw difference scores to predict other outcomes due to concern

regarding reliability, noting that error associated with each of the two individual scores is compounded. The focus of the present study was to consider factors that *predict* differences in parent and teacher ratings and like previous research of this type (i.e., Takeda et al., 2016), used a raw difference score. Standardized difference variables were also considered and results of regression analyses did not differ as compared to analyses using the raw difference score. Laird and De Los Reyes (2013) suggest measuring discrepancies using growth models that correct for measurement error, arguing that this method yields more reliable true discrepancy scores. In addition, use of structural equation modeling would allow for consideration of mediating and moderating influences among factors found to predict discrepancies in parent and teacher ratings. For example, it is quite likely that parenting stress, as well as perhaps parent-child relationship frustration, may mediate the relationship between certain demographic variables (i.e., parent mental health) and parent ratings of child behavior, as well as discrepancies in parent and teacher ratings.

Another limitation of using raw difference scores was that understanding the results of categorical variables was more difficult, and the absolute value of the difference scores needed to be used for interpretation. However, the absolute value of the difference scores provides information only in regard to the extent or magnitude of the differences, whereas raw difference scores are able to explain both the extent and direction of the discrepancies. Consistent with previous research, the present study found less influence of demographic variables as compared to the parenting and academic variables. This finding is likely due to the stronger association between variables that use the same method (i.e., self-report), as well as the more nuanced influence of demographic variables on ratings of child behavior. However, the influence of demographic variables is clinically relevant and has been hypothesized to help explain why

certain minority groups are less likely to be evaluated, diagnosed, and treated (Harvey et al., 2013). As mentioned, structural equation models may provide better understanding of the influence of demographic variables in combination with parenting factors, such as parenting stress, in explaining informant discrepancies.

The present study considered the relative influence of several known and lesser-researched predictors of parent-teacher discrepancies on ratings of child externalizing behavior problems, as well as ratings of attention problems, hyperactivity, and aggression. Parenting stress, relational frustration, income, and academic performance emerged as the most consistent predictors of discrepancies, which highlights the need for clinicians to exhibit special consideration of these factors when assessing for child behavior problems. Future research should attempt to further understand these findings by using a larger, more diverse sample of participants. Additionally, using alternative statistical analysis procedures may result in greater predictive utility of parent-teacher discrepancies.

Table 1

Participant Demographics

Variable	<i>N</i>	%	<i>M</i>	<i>SD</i>	Range
Child Gender					
Male	130	69.1			
Female	58	30.9			
Child Age (in months)			95.76	19.50	62-153
Child Ethnicity					
Caucasian	169	90.4			
African-American	3	1.6			
Hispanic	3	1.6			
Biracial	11	5.9			
Other	1	0.5			
Annual Family Income					
Less than \$30,000	97	51.6			
\$30,000 to \$60,000	53	28.1			
More than \$60,000	38	20.3			
Child ADHD Diagnosis					
ADHD- combined type	95	51.9			
ADHD- inattentive type	10	5.5			
Other ADHD	24	12.8			
No ADHD diagnosis	54	29.5			
Informant					
Mother	155	82.4			
Father	22	11.7			
Grandparent	3	1.6			
Stepparent	2	1.1			
Adoptive Parent	3	1.6			
Other	3	1.6			
Informant Mental Health					
None	125	67.2			
ADHD	3	1.6			
Depression	17	9.1			
Anxiety	10	5.4			
Substance use	1	0.5			
Other	3	3.2			
More than one	24	12.9			

Note. Other ADHD = ADHD not otherwise specified, provisional, or rule out.

Table 2

Mean, Standard Deviation, and Range for Primary Research Variables

Variable	<i>M</i>	<i>SD</i>	Range
BASC-2 Parent Ratings			
Externalizing Problems	62.95	15.11	36-105
Hyperactivity	66.20	14.31	36-98
Aggression	57.63	14.74	36-105
Attention Problems	67.83	7.89	45-84
BASC-2 Teacher Ratings			
Externalizing Problems	60.16	13.00	41-91
Hyperactivity	64.26	13.88	40-91
Aggression	56.46	13.85	42-94
Attention Problems	63.55	7.81	38-75
BASC-2 Difference Scores			
Externalizing Problems	2.83	16.88	-36-50
Hyperactivity	1.96	16.41	-41-40
Aggression	1.17	17.80	-41-57
Attention Problems	4.23	10.40	-24-36
PRQ			
Attachment	47.72	11.41	1-69
Involvement	51.84	11.39	4-75
Relational Frustration	54.25	13.25	29-100
PSI-SF			
Total Stress Score	50.02	27.74	1-99
APRS			
Language Arts	6.01	2.39	2-10
Mathematics	6.39	2.32	2-10
Teacher Time Known	6.95	7.81	0.25-72

Note. BASC-2 = Behavior Assessment System for Children-Second Edition. PRQ = Parenting Relationship Questionnaire. BASC-2 and PRQ scores are reported as T-Scores. Scores of 60 and above on the BASC-2 are considered clinically significant. Scores of 40 and below on the Attachment and Involvement scales on the PRQ are considered clinically significant. Scores above 40 on the Relational Frustration scale on the PRQ is considered clinically significant. BASC-2 Difference Scores = parent rating minus teacher rating. PSI-SF = Parenting Stress Index, Short Form. PSI-SF scores are reported as percentiles. Percentiles above 50 are considered clinically significant. APRS = Academic Performance Rating Scale. Teacher Time Known = length of time teacher has known child (in months).

Table 3

Correlations Between Primary Research Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Age	-										
2. Ethnicity	-.04	-									
3. Income	.06	-.09	-								
4. PRQAttach	-.08	.01	.20**	-							
5. PRQInvolve	-.14	.11	.13	.61**	-						
6. PRQRelFrust	-.07	-.09	-.20**	-.50**	-.42**	-					
7. PSITotal	.00	-.01	-.19**	-.53**	-.52**	.61**	-				
8. InfMH	.10	.02	.11	.14	.16*	-.17*	.24**	-			
9. AcadPerf	-.02	.05	.08	.04	.02	.04	-.06	-.11	-		
10. TimeKnown	.03	.05	.15*	.08	-.02	.07	.04	-.02	-.10	-	
11. PTextDiff	.02	-.14	-.20**	-.37**	-.27**	.46**	.43**	-.16*	.12	-.09	-

Note. Age = child age (in months); Ethnicity = child ethnicity (Caucasian vs. non-Caucasian); Income = family income level; PRQAttach = Parenting Relationship Questionnaire Attachment Scale; PRQInvolve = Parenting Relationship Questionnaire Involvement Scale; PRQRelFrust = Parenting Relationship Questionnaire Relational Frustration Scale; PSITotal = Parenting Stress Index-Short Form total stress score; InfMH = informant mental health (reported mental health problem vs. no reported mental health problems); AcadPerf = academic performance; TimeKnown = length of time teacher has known child (in months); PTextDiff = parent-teacher difference score for the BASC-2 externalizing problems scale.

* $p < .05$. ** $p < .01$.

Table 4

Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2

Externalizing Problems Scale

Variable	R^2	ΔR^2	β	F	df
Step 1	.08**			3.84	4, 183
Child Age			.04		
Child Ethnicity			-.15*		
Income			-.19**		
Informant MH			-.13		
Step 2	.28**	.20		8.55	8, 179
Child Age			.04		
Child Ethnicity			-.12		
Income			-.09		
Informant MH			-.05		
PRQAttach			-.14		
PRQInvolve			.07		
PRQRelFrust			.26**		
PSI-SF Total			.20*		
Step 3	.30**	.02		7.52	10, 177
Child Age			.04		
Child Ethnicity			-.12		
Income			-.09		
Informant MH			-.03		
PRQAttach			-.13		
PRQInvolve			.06		
PRQRelFrust			.25**		
PSI-SF Total			.22*		
Time Known			-.07		
AcadPerf			.12		

Note. Informant MH = Informant Mental Health; PRQAttach = Parent Relationship Questionnaire Attachment Scale; PRQInvolve = Parent Relationship Questionnaire Involvement Scale; PRQRelFrust = Parent Relationship Questionnaire Relational Frustration Scale; PSI-SF Total = Parenting Stress Index-Short Form Total Stress Score; Time Known = length of time teacher has known child; AcadPerf = academic performance. * $p < .05$. ** $p < .01$.

Table 5

Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2

Hyperactivity Scale

Variable	R^2	ΔR^2	β	F	df
Step 1	.06*			2.91	4, 183
Child Age			-.03		
Child Ethnicity			-.06		
Income			-.19**		
Informant MH			-.12		
Step 2	.18**	.12		5.02	8, 179
Child Age			-.03		
Child Ethnicity			-.04		
Income			-.11		
Informant MH			-.05		
PRQAttach			-.09		
PRQInvolve			.06		
PRQRelFrustr			.17		
PSI-SF Total			.21*		
Step 3	.22**	.04		4.91	10, 177
Child Age			-.02		
Child Ethnicity			-.04		
Income			-.11		
Informant MH			-.03		
PRQAttach			-.08		
PRQInvolve			.06		
PRQRelFrustr			.17		
PSI-SF Total			.24*		
Time Known			-.12		
AcadPerf			.14*		

Note. Informant MH = Informant Mental Health; PRQAttach = Parent Relationship Questionnaire Attachment Scale; PRQInvolve = Parent Relationship Questionnaire Involvement Scale; PRQRelFrustr = Parent Relationship Questionnaire Relational Frustration Scale; PSI-SF Total = Parenting Stress Index-Short Form Total Stress Score; Time Known = length of time teacher has known child; AcadPerf = academic performance. * $p < .05$. ** $p < .01$.

Table 6

Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Attention Problems Scale

Variable	R^2	ΔR^2	β	F	df
Step 1	.05*			2.47	4, 183
Child Age			-.14		
Child Ethnicity			-.05		
Income			-.17*		
Informant MH			.04		
Step 2	.09*	.04		2.32	8, 179
Child Age			-.13		
Child Ethnicity			-.05		
Income			-.13		
Informant MH			.08		
PRQAttach			-.04		
PRQInvolve			.08		
PRQRelFrust			.10		
PSI-SF Total			.15		
Step 3	.14**	.05		2.81	10, 177
Child Age			-.13		
Child Ethnicity			-.06		
Income			-.15*		
Informant MH			.11		
PRQAttach			-.05		
PRQInvolve			.08		
PRQRelFrust			.08		
PSI-SF Total			.18		
Time Known			-.01		
AcadPerf			.21**		

Note. Informant MH = Informant Mental Health; PRQAttach = Parent Relationship Questionnaire Attachment Scale; PRQInvolve = Parent Relationship Questionnaire Involvement Scale; PRQRelFrust = Parent Relationship Questionnaire Relational Frustration Scale; PSI-SF Total = Parenting Stress Index-Short Form Total Stress Score; Time Known = length of time teacher has known child; AcadPerf = academic performance. * $p < .05$. ** $p < .01$.

Table 7

Multiple Linear Regression Predicting Parent-Teacher Discrepancies on the BASC-2 Aggression Scale

Variable	R^2	ΔR^2	β	F	df
Step 1	.30**			4.58	4, 183
Child Age			.12		
Child Ethnicity			-.16*		
Income			-.19**		
Informant MH			-.14*		
Step 2	.47**	.17		6.44	8, 179
Child Age			.13		
Child Ethnicity			-.14*		
Income			-.10		
Informant MH			-.08		
PRQAttach			-.12		
PRQInvolve			.11		
PRQRelFrustr			.23**		
PSI-SF Total			.17		
Step 3	.50**	.03		5.82	10, 177
Child Age			.13*		
Child Ethnicity			-.14*		
Income			-.10		
Informant MH			-.06		
PRQAttach			-.10		
PRQInvolve			.10		
PRQRelFrustr			.23**		
PSI-SF Total			.19*		
Time Known			-.10		
AcadPerf			.11		

Note. Informant MH = Informant Mental Health; PRQAttach = Parent Relationship Questionnaire Attachment Scale; PRQInvolve = Parent Relationship Questionnaire Involvement Scale; PRQRelFrustr = Parent Relationship Questionnaire Relational Frustration Scale; PSI-SF Total = Parenting Stress Index-Short Form Total Stress Score; Time Known = length of time teacher has known child; AcadPerf = academic performance. * $p < .05$. ** $p < .01$.

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