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Abstract

Objective: The current study examined the impact of the gender of children with ADHD on teachers' perceptions toward inattentive, hyperactive, or oppositional behaviors, and how these perceptions relate to teachers' ratings of children's impairment and referral recommendations. **Method:** Teachers read eight vignettes depicting boys and girls with different subtypes of ADHD, as well as one depicting comorbidity (ADHD + ODD). Teachers then completed measures of impairment, and responded to questions about what services they would likely refer for the child and why. **Results:** Teachers rated girls as being significantly more impaired and more in need of services than boys. Regardless of gender, teachers overwhelmingly reported preferring the use of behavior modification for the described child. Also, children who were described with symptoms of ADHD-predominately inattentive subtype were rated as being the least impaired, while girls described as hyperactive and impulsive were rated by teachers as being the most impaired. **Conclusion:** The current study adds to previous literature on gender bias in ADHD referrals by providing evidence for the differential referral of ADHD boys and girls to treatment based on presentation of symptoms. (*J. of Att. Dis.* 2012; 16(2) 101-108)

Keywords

ADHD, gender differences, teacher referral, classroom impairment

ADHD is characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity, with symptoms typically emerging in early childhood (American Psychiatric Association [APA], 2000). With an estimated prevalence rate of 2% to 9% in the United States and worldwide (Froehlich et al., 2007), it is one of the most frequent problems encountered in mental health, primary care, and educational settings.

Many behaviors that are typical in children with ADHD cause a great deal of disruption in the classroom setting. More specifically, children with ADHD often call out, get out of their seat without permission, are noncompliant, spend significant amounts of time off task, and fail to complete classroom assignments more often than their same age peers (Abikoff et al., 2002; Barkley, Fischer, Edelbrock, & Smallish, 1990). These behaviors cause disruption in the classroom and also place children with ADHD at increased risk for academic underachievement and school drop-out (e.g., Barkley, 2006; Barkley et al., 1990; Gittelman, Mannuzza, Shenker, & Bonagura, 1985).

Because the behaviors of children with ADHD are likely to first be observed in the classroom setting, teachers are essential to the early identification of children in need of

services and referrals. The *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition, Text Revision; *DSM-IV-TR*; APA, 2000) criteria for ADHD explicitly states that cross-situational impairment is necessary for diagnosis, resulting in teachers often being requested to complete symptom and impairment rating scales with the goal of identifying children in need of services. In addition, a child's behavior in the classroom is often the first indication that there is a developing problem. Indeed children are most often initially assessed at the recommendation of a teacher (Sax & Kautz, 2003) and parents often consult with teachers about symptoms and recommendations about behavior management approaches. Thus, an understanding of teachers' view of ADHD symptoms is of vital importance to early identification of the disorder. Furthermore, teachers are essential to treatment of children with ADHD. School-based interventions,

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such as token reinforcement and response cost systems, show a strong evidence base (i.e., effect sizes in the moderate to high range) and consistently produce clinically significant improvements in classroom deportment (DuPaul & Eckert, 1997; Pelham, Pelham, & Fabiano, 2008; Wheeler & Chronis, 1998).

Gender Differences in ADHD

There exists a significant gender difference among individuals who present for treatment with impairments associated with ADHD. Male to female ADHD prevalence ratios appear to be dependent on whether the sample is drawn from clinical (i.e., referred) or community-based settings. In clinical samples, the prevalence ratio ranges from 9:1 to 2:1 (APA, 2002) but boys are diagnosed with ADHD only about two to three times more frequently in population-based samples (Szatmari, Offord, & Boyle, 1989; Taylor, Hepinstall, Songuga-Barke, & Sandberg, 1998), indicating that boys are being referred disproportionately more often than girls and that only the most impaired girls are being referred (Arica & Conners, 1998; Gaub & Carlson, 1997).

This gender difference in referral rates may be somewhat surprising, as both clinic-referred males and females with ADHD present with comparable background characteristics and rates of core symptoms (Gaub & Carlson, 1997; Gershon, 2002). One possible explanation for this discrepancy may be gender differences in symptom presentation. Research suggests that boys generate higher ratings of hyperactivity and inattentiveness compared to girls matched for age, by both parents and teachers (Achenbach, 1991; Bauermeister, Alegria, Bird, Rubio-Stipec, & Canino, 1992; Brito, Pinto, & Lins, 1995; Trites, Blouin, & Laprade, 1980). Our relative lack of knowledge about ADHD in girls is at least partially a function of this difficulty in the identification of girls with ADHD (Bussing et al., 2008; Graetz, Sawyer, Baghurst, & Ettridge, 2005).

Researchers have suggested that the difference between referred and non-referred children with ADHD, and thus the differences in referral rates, is the result of gender differences in the expression of ADHD symptoms. Girls with ADHD generally display lower rates of hyperactivity, greater intellectual impairment, lower rates of comorbid oppositional defiant disorder (ODD) and conduct disorder (CD), higher rates of internalizing problems and less aggression, as compared to boys (Biederman et al., 1999; Gaub & Carlson, 1997; Gershon, 2002; Hinshaw, 2002). Because teachers tend to notice children who display behaviors that are more overtly hyperactive and disruptive, they may be more likely to refer them for treatment. Groenewald, Emond, and Sayal (2009) found that teachers were able to accurately recognize problems in girls, but were more likely to conceptualize them as emotional or attentional difficulties rather than ADHD

per say, potentially influencing the type of treatment for which teachers are more likely to refer girls. Thus, discrepancies in the prevalence of referred and non-referred cases may be the result of how teachers and parents view the specific domains of impairment in boys and girls, even when the same symptoms are present.

Meta-analysis of gender differences in referral rates have shown sample source mediating ADHD gender patterns on a number of variables. In community samples, girls were rated lower on inattention, internalizing behaviors, peer aggression, and peer dislike than boys, however the same result was not found in clinic-based studies (Gaub & Carlson, 1997). This suggests that samples drawn from clinic-based samples may not accurately reflect the referral rates or perceptions of community members, namely teachers. This highlights the need to conduct research in samples that are in most cases responsible for the initial identification of children in need of services.

Biases in referrals are of particular importance, as girls are clearly in need of services related to their impairments associated to ADHD. For example, compared to boys with ADHD, girls are more likely to experience peer rejection and social isolation (Biederman et al., 1999; Gaub & Carlson, 1997). Also, girls with ADHD typically score lower on measures of intellectual functioning and academic achievement than girls without ADHD, and are 16 times more likely to repeat a grade (Biederman et al., 1999). Despite these statistics, it has been reported that gender is a bigger risk factor for failing to access ADHD services than low family financial resources, rural living, and access to medical insurance, combined (Bussing, Zima, Perwien, Belin, & Widawski, 1998).

Teacher Treatment Preference

Given previous research findings indicating that teachers respond differentially to male and female students, at least partially because of sex-specific comorbid symptom patterns (Gaub & Carlson, 1997), teachers' acceptance of various treatment strategies may also be related to gender of the child. It appears that not only are children's symptom patterns influencing their identification and referral, they also have an impact on the treatments that teachers endorse as being more acceptable. Part of this gender bias may be the cause of teacher differences in treatment preference. For example, a study by Pisecco, Huzinec, and Curtis (2001) found that teachers refer boys for services more often than girls with ADHD because they expect that medication will be more beneficial for boys. Similarly, teachers may seek help less often for females, as they believe girls' ADHD symptoms can be sufficiently treated with behavioral techniques implemented in the classroom.

Previous literature has highlighted general characteristics that describe classroom interventions preferred by teachers, including positive treatments, and treatments that require less time (Eliot, Witt, Galvin, & Peterson, 1984; Witt, Martens, & Elliott, 1984), as well as teacher characteristics that influence treatment preference (i.e., years of experience), yet little information is known about what types of services teachers would refer specific children to, based on ADHD subtype, symptom presentation or even gender.

Previous studies of gender biases in ADHD have taken a symptom-based approach, in that teachers and parents have generally rated the child's number of symptoms as criteria for treatment (e.g., Groenewald et al., 2009). However, assessing impairment is an explicit component of assessment and, perhaps more importantly, a means of identifying treatment targets and evaluating treatment outcomes (Fabiano et al., 2006). In an examination of symptom severity and impairment in children with ADHD, Gordon and colleagues (2006) found that correlations between the two were modest, at best, and that symptom severity rarely accounted for more than 25% of the variance in impairment. As previous studies have exclusively examined referrals based on symptom presentation, the question of what leads children, both boys and girls, to be referred for services has remained unanswered. Although boys and girls may have distinct symptom patterns, it is possible that teachers' perceptions of who is the most impaired is the most important determinant of which they refer for treatment.

To our knowledge, there have been no studies that have examined teachers' perceptions toward inattentive, hyperactive, or aggressive children, how these perceptions relate to the teachers ratings of the child's overall impairment, and how teachers' conceptions of gender influence impairment ratings, an examination of which will ultimately provide us with a better understanding of the referral process for ADHD. Thus, the goal of the current study is to examine the impact of teachers' perceptions on referral of ADHD boys and girls to treatment as well as to provide insight into differential referral based on ADHD subtype and gender. In addition, we will explore how teachers' perceptions of impairment (separate from ADHD subtype) influences not only referral, but also treatment recommendations and how that relates to gender.

Method

Participants

The participants comprised 50 elementary and middle school teachers (general and special education), from kindergarten to fifth grade, from 14 schools in suburban and rural districts in Maine (see Table 1 for characteristics). The overall response rate across the schools was 26%. School enrollment

Table 1. Teacher Characteristics

Characteristics	N (%)
Gender	
Male	5 (10%)
Female	45 (90%)
Ethnicity	
White	48 (96%)
Native American	1 (2%)
Not reported	1 (2%)
Highest level of education	
Bachelor's degree	24 (48%)
Master's degree	23 (46%)
Other (e.g., EdD; PhD)	3 (6%)
Certification	
Regular education only	28 (56%)
Special education only	11 (22%)
Other	11 (22%)
Average number of ADHD children previously taught	4
Age (<i>M, SD</i>)	45 (9.9)
Years of teaching experience (<i>M, SD</i>)	15 (9.6)

for grades kindergarten through five ranged from 49 students to 398 students (mean = 217.8).

Procedure

Vignettes. Teachers were given eight vignettes describing the symptom presentation of boys and girls with inattentive, hyperactive/impulsive, combined (hyperactive/impulsive + inattentive) and comorbid (hyperactive/impulsive + ODD) behaviors. For each behavior subtype, vignettes varied by gender of the child name (e.g., Michael vs. Michelle and Louis vs. Louisa) and gender pronouns. All teachers received identical vignettes. Each vignette was between 125 and 135 words long and described an 8-year old child whose behaviors met the symptom criteria for ADHD as defined by the *DSM-IV-TR* (APA, 2000). To ensure that vignettes described children who clearly met the DSM-IV-TR criteria for ADHD and ODD, two clinical psychology graduate students and the first author reviewed and revised each vignette so that all raters agreed on the number of symptoms presented in each description of the child's behavior, and that the symptoms presented were consistent with a diagnosis of ADHD or ODD. A representative sample of an inattentive-subtype ADHD and a hyperactive/impulsive ADHD + ODD vignette is offered in appendix. Teachers were given the vignettes in randomized order to decrease the influence of order on his/her subsequent ratings. Care was taken when constructing the vignettes to not include information about the level of impairment being experienced by each described child.

Following each vignette, teachers completed the Impairment Rating Scale (see below) and ranked how likely they

were to refer the child depicted in the vignette to a particular type of treatment on a 1-10 Likert-type scale, where 1 = *least likely* and 10 = *most likely*. Treatment preference choices included: behavior modification, stimulant medication, learning assistance (special education), social skills training, small groups counseling, individual counseling/therapy, tutoring, combination (other), or no treatment necessary. Next, teachers were asked to rank the factors most and least important in making a referral for the specific child using a 6-point Likert-type scale where 1 = *least important* and 6 = *most important*. Factors included the child's symptom severity, impairment, gender, amount of time necessary (e.g., for discipline), the amount of frustration the child elicited, as well as the amount of disruption the child caused. Lastly, teachers were asked to rank the factors important in making a referral for a specific treatment, where factors included time, efficacy, time to effect, resources, parental involvement, rationale/agreement with treatment theory, no side effects, implementation by another person, no required change in teaching style, and no classroom disruption where 1 = *least important* and 10 = *most important*.

Schools were randomly selected from a list of public elementary and middle schools in Maine. The second author contacted principals, who explained the procedures and purpose of the study. Of the 18 schools contacted, 4 refused participation, resulting in a 78% school participation rate. After principals provided permission, questionnaire packets were mailed and driven to schools to be distributed in teachers' mailboxes. Of the 200 packets distributed, 51 packets were returned (26% response rate). Data from one teacher was removed due to missing information, resulting in a usable response rate of 25%. Respondents received monetary compensation for their participation.

All questionnaires had consent letters fully describing the study and the requirements of participation, its voluntary nature, and confidentiality information. The Institutional Review Board (IRB) approved all procedures.

Measures

Demographic Questionnaire. We obtained information regarding teacher gender, ethnicity, age, education, teaching experience, educational setting classification (e.g., regular education, special education, or "other" such as art or physical education), grade taught, and number of children previously taught with ADHD.

Impairment Rating Scale (IRS; Fabiano et al., 2006). The IRS is a 6-question measure designed to assess teacher perceptions of a child's impairment along a 5-point Likert-type scale 0 = *definitely not* to 5 = *definitely yes* in multiple domains (academic performance, classroom functioning, self-esteem, relationships with peers and teachers, and overall), as well as how in need of treatment or special services

the child is. The measure has adequate cross-informant reliability (correlations above .47) and convergent and divergent validity with other impairment scales (e.g., correlation of .77 with IRS overall impairment and the Children's Global Assessment Scale). The measure of overall impairment was used in the current study.

Results

Gender Differences

To determine the influence of gender and subtype on teachers' ratings of impairment, a 2 (child gender) \times 4 (ADHD subtype) repeated measures ANOVA was conducted, with teacher ratings of the child's overall impairment (as rated on the IRS) serving as the dependent variable. A main effect was found for child gender, such that teachers rated girls as significantly more impaired than boys ($F[1,47] = 5.63, p < .05, \eta^2 = .11$), and thus, in greater need of services. Results also yielded main effects for subtype ($F[3,141] = 9.39, p = .001; \eta^2 = .23$), such that teachers rated children depicted with ADHD + ODD as more impaired and in greater need of services than children depicted with ADHD alone, regardless of subtype. Children portrayed with inattentive-subtype were rated as significantly less impaired than all other subtypes (inattentive vs. hyperactive/impulsive: $d = .34$; vs. combined: $d = .30$; vs. ADHD + ODD: $d = .76$; all p 's $< .01$).

Post-hoc analyses found a significant interaction between gender of the child and ADHD subtype ($F[3,141] = 1.34, p = .001, \eta^2 = .11$). Furthermore analysis revealed that although girls were rated as more impaired and in need of services in the hyperactive/impulsive and ADHD + ODD subtypes, this effect was only statistically significant for hyperactive/impulsive condition $t(49) = 4.17, p < .001$. Furthermore, although females were rated as less impaired than boys in the combined subtype, the difference failed to meet significance $t(47) = .893, p > .05$. The means and standard deviations for gender and subtype are presented in Table 2. Tables 3 and 4 present cell means, standard deviations, significance levels for individual dimensions, and univariate results for gender and subtype, respectively.

Treatment Preferences

Teacher treatment preference for behavior modification was investigated by first recoding rankings such that a "1" was assigned each time teachers ranked behavior modification as their top treatment choice and "0" when other treatments were ranked preferentially. A repeated measures ANOVA subsequently found no main effects of gender or subtype, and no interaction effects; teachers rated behavior modification more often as their top choice for girls in the inattentive,

Table 2. Means and Standard Deviations for Measure of Teacher Rated Impairment as a Function of Gender Condition and Subtype Condition

ADHD Subtype	Gender	
	Male <i>M</i> (<i>SD</i>)	female <i>M</i> (<i>SD</i>)
Predominately inattentive	3.67 (.80)	3.69 (.85)
Predominately hyperactive-impulsive	3.79 (.92)	4.25 (.81)
Combined type	4.02 (.79)	3.94 (.76)
ADHD + ODD	4.40 (.71)	4.48 (.68)

Note: ODD = oppositional defiant disorder.

Table 3. Means (and Standard Deviations) and ANOVA Results for Child Impairment as a Function of Gender

Measure	Gender		<i>F</i> (1,194)	ES
	Male	Female		
IRS	3.94 (.86)	4.08 (.82)	7.16**	.36

Note: IRS = impairment rating scale.

* $p < .05$. ** $p < .01$ *** $p < .001$.

Table 4. Means (and Standard Deviations) and ANOVA Results for Child Impairment as a Function of ADHD Subtype

Measure	Subtype				<i>F</i> (3,288)	ES
	Inattentive	H/I	Combined	ADHD + ODD		
IRS	3.67 (.82)	4.02 (.88) ^a	3.96 (.77) ^a	4.42 (.70) ^{a,b,c}	23.55*	.20

Note: ODD = oppositional defiant disorder; IRS = impairment rating scale.

^aSignificant difference from inattentive.

^bSignificant difference from hyperactive/impulsive.

^cSignificant difference from combined.

* $p < .001$.

combined, and ADHD + ODD conditions, although these effects failed to meet significance. Notably, teachers chose behavior modification as their top treatment preference in 47 of 50 cases (96%).

A similar procedure was conducted utilizing medication as top treatment preference. Again, no main effects of gender or subtype were found, although gender \times subtype interaction was significant ($F[3,144] = 5.56, p < .001$). Medication was rated as the top treatment preference more often for girls in the ADHD + ODD and hyperactive/impulsive conditions, although effects were significant for hyperactive subtype $t(49) = 2.82, p < .05$ only. In addition, paired t tests found that medication was rated as the top treatment choice significantly more often for boys than for girls $t(48) = 2.07, p < .05$, in the combined subtype.

Next, a series of binary logistic regressions (see Table 4) were computed to examine the links between impairment and treatment preference. Correlations between impairment and demographic variables yielded significant results for number of years teaching ($r[50] = .30, p < .05$), although only for the ADHD + ODD boy condition. Thus, this variable was entered as a control variable into the first block, and impairment was entered into the second block. Impairment emerged as a significant predictor of treatment preference for behavior modification for the child depicted as hyperactive/impulsive male ($\beta = -.170, SE = .073, p < .05$), and hyperactive/impulsive female condition ($\beta = -.174, SE = .087, p = .05$), in that the more impaired teachers rated the child, the more likely they were to prefer behavior modification. Impairment was also found to significantly predict preference for either medication or behavior modification for the hyperactive/impulsive boy condition ($\beta = -.167, SE = .072, p < .05$), suggesting that whether teachers viewed hyperactive/impulsive children as more impaired, they were more likely to prefer behavior modification or medication.

Referral Information

The mean sum of rank scores was computed for factors considered when referring a child to treatment. The highest mean rank ($M = 4.87$) was evidenced for the severity of the child's symptoms, implying that teachers devote the greatest weight to this factor when considering referring a child to treatment. Similar mid-range mean ranks, denoting moderate importance, were evidenced for impairment ($M = 3.89$), how disruptive the child is in the classroom ($M = 3.87$), amount of time the child requires ($M = 3.62$), and the amount of frustration the child elicits ($M = 3.66$). Lowest overall importance was assigned to the child's gender, with a mean rank score of 1.00.

A series of Wilcoxon Signed-ranks tests indicated that teachers ranked classroom disruptiveness more highly when considering making a referral for females ($Mdn = 4.00$) than for males ($Mdn = 3.75, Z = 2.06, p < .05, r = .29$), and that teachers ranked frustration as more important when considering referral for males ($Mdn = 3.75$) than for females ($Mdn = 3.25, Z = 2.14, p < .05, r = .30$). No significant differences between males and females were found for importance of symptom severity, impairment, gender, and amount of attention on treatment referral.

Mean sum of rank scores was computed for factors influencing teachers' treatment preference. The highest ranks, denoting greatest importance, were given to parental involvement in treatment ($M = 7.57$) and availability of resources ($M = 7.02$). High ranks were also indicated for teachers' agreement with the rationale behind the treatment ($M = 6.45$) and the treatment's perceived efficacy ($M = 6.52$). Mean ranks in the mid-range were found for time required for

treatment ($M = 5.55$), time to effect ($M = 5.02$), treatment not affecting other students ($M = 4.46$), and no side effects ($M = 4.90$), suggesting moderate importance of these factors when teachers refer a child to a particular type of treatment. Low mean ranks, denoting factors of little importance in teacher treatment preference, included implementation of the treatment by other people ($M = 2.75$) and no required change in teaching style ($M = 2.50$). A Wilcoxon-Signed ranks test revealed no differences between the boys and girls depicted in the vignettes on any factors related to teachers' treatment preference.

Discussion

The current study sought to elucidate the reasons for gender discrepancies in identification and referral rates for ADHD, as well as to serve as a preliminary exploration into how teachers' perceptions of gender, subtype and impairment influence the type of services they refer students. These results, as well as clinical implications of the findings, will be discussed.

Teachers in the current study rated girls as being significantly more impaired and more in need of services than boys, particularly in the hyperactive/impulsive subtype condition. This finding was particularly striking, as the only difference in the vignettes for each respective subtype was the gender of the child. Girls, who were depicted with identical behaviors as boys, were perceived by teachers as being more impaired and more in need of services. In addition, children who were described as having symptoms of ADHD-predominately inattentive subtype were rated as being the least impaired, while girls with hyperactive/impulsive subtype were rated by teachers as being the most impaired. Previous literature has shown that girls generally display lower levels of hyperactivity, which has been theorized to explain the discrepancy in referral rates for girls (e.g., Groenewald et al., 2009). One explanation for our findings is that the characterization of a girls' behavior as hyperactive and impulsive, as shown in the vignettes, was not seen as normative for the teachers who completed the ratings, thus resulting in ratings that were more extreme than were reported for the boys.

Also, the current study suggests that the severity of the child's symptoms has the biggest influence on referral for treatment, above and beyond child gender. This finding, coupled with our other findings, implies that teachers are attending to how impaired a child is (male or female), as opposed to number of symptoms that the child is displaying in the classroom, when referring them for treatment.

Taking these findings together, it is possible that the more overt and disruptive behaviors of hyperactivity and impulsivity have a greater impact on teachers initiation of the referral process, as opposed to less outwardly noticeable symptoms

of inattention. Because girls are more likely to display symptoms of inattention, they are perhaps less likely to be referred, not necessarily because of gender, but because they are more likely to be overlooked based on their symptom presentation.

In general, children with ADHD and ODD were rated by teachers as being more impaired, when compared to children with ADHD alone, but this effect was only significant in the hyperactive/impulsive subtype. Similar to the finding that children described as inattentive were rated as less severe, it appears that the hyperactivity and impulsivity dimensions of ADHD are related to increased ratings of impairment, in addition to being rated as more in need of treatment. Based on this finding, it appears that teachers are less likely to recognize typical behaviors seen in children with inattentive type ADHD as being as impairing as hyperactivity and impulsivity. Previous literature has documented the negative impact that disruptive behavior has on the functioning of the classroom and on a teachers' ability to function (Abikoff et al., 2002; Barkley et al., 1990). This finding adds to the literature (e.g., Groenewald et al., 2009) by providing furthermore evidence that teachers are less likely to report inattentive behaviors as impairing or in need of treatment, which can have devastating impact on the ability of children who display this cluster of symptoms to receive services.

We were also interested in the relationship between gender, impairment, and what types of treatments teachers prefer. Teachers overwhelmingly reported preferring the use of behavior modification, regardless of the child's gender, subtype, comorbidity, or ratings of impairment. Our findings also indicated that teachers consider parental involvement in treatment and availability of resources as the most important considerations in treatment preferences, regardless of gender of the child.

Consistent with previous work (Pisecco et al., 2001), we also found that teachers rated medication as the preferred treatment modality more often for boys than for girls. This finding can at least be partially explained by teachers' expectations for the behaviors that are more typically displayed by boys (i.e., hyperactivity/impulsivity) and the general understanding of how stimulant medication targets this particular set of symptoms. Although we do not have a way to directly test this hypothesis, given teachers elevated ratings of impairment in girls but preference for medication for boys, it is possible that ratings of impairment are not directly related to teachers preference for medication and is more a function of gender.

There are several clinical implications that can be gleaned from our findings. Foremost, given that girls are more likely to be categorized as inattentive but are less likely to be referred for services because of their symptom presentation, it is crucial that teachers, parents, and school personnel identify and refer children (in particular, girls) who display symptoms

of inattention for appropriate services. The identification of children in need of services, as well as the appropriate intervention given a child's domains of impairment, is a serious public health concern. Also, teachers rated gender as the least important factor in referring children to treatment, but were concerned about resources and parental involvement, highlighting the need for resources for classroom teachers, as they are, in many cases, responsible for implementing treatments.

Although there is evidence of a gender bias in referrals and that there may be differential referrals based on ADHD subtype, there are some limitations to the current study that should be noted. Foremost is that teachers were not initially asked what treatments they had previous knowledge of. It is possible that teachers were not familiar with all of the treatments listed, potentially skewing the results. Related to this limitation, teachers' baseline knowledge of ADHD was not assessed, which could have impacted the results. More specifically, about a quarter of the teachers were special education teachers, who potentially have more experience with reasons for referrals, as well as available resources. It is possible that our findings could have been different if we only recruited regular education teachers. Also, all data collection occurred in a rural setting, which necessitates caution about the generalizability of results. Because rural schools may have less access to resources, teachers in these schools may be less familiar with the referral choices they were given as part of the current study.

There are several future areas of research worth noting, based on the current findings. For example, it would be worthwhile to compare our results with teachers' ratings of children who they observe in their own classroom. Also, it would be important to look at hyperactive/impulsive children to determine exactly what specific symptoms are reported by teachers to be the most impairing, above and beyond a categorical diagnosis.

In summary, the current study adds to previous literature on gender bias in ADHD referrals by providing evidence for the differential referral of ADHD boys and girls to treatment based on presentation of symptoms. We also provide initial evidence for differential referral based on ADHD subtype. The study has important implications for understanding ADHD service use and teachers' perceptions of children's impairment and need for clinical services.

Appendix. Sample Vignette

A.) Michael is a 9-year-old boy. His teacher describes him as having difficulty keeping his attention focused in work and play activities. Michael often makes careless mistakes in his work and fails to pay close attention to details. Although he is obedient and seems to understand instructions, Michael frequently fails to complete his assigned duties, work and

chores. In addition, Michael seems to avoid work that requires sustained mental effort, such as schoolwork and homework. When spoken to directly, Michael often appears to not listen, as if he is off in a daze. It is likely that Michael's inability to sustain attention contributes to his difficulty in organizing everyday tasks. Michael experiences the same problems both at home and at school, and has been this way since before kindergarten.

B.) Michelle is a 9-year-old girl. Her teacher describes her as forgetful in her daily activities as she frequently loses or misplaces items necessary for tasks and activities, such as notebooks, books, pencils, keys, or gym shoes. It is likely that Michelle's forgetfulness contributes to her difficulty in organizing her daily duties, work, and activities. As well, Michelle displays difficulty in keeping her attention focused during tasks and leisure activities as she is easily distracted by people, events, and trivial details in her environment. Furthermore, she displays a tendency to procrastinate and is often reluctant to begin or engage in challenging academic and mental tasks, such as written work. Michelle experiences the same problems both at home and at school, and has been this way since before kindergarten.

Declaration of Conflicting Interests

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