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The Impact of *DSM-5* A-Criteria Changes on Parent Ratings of ADHD in Adolescents

Margaret H. Sibley[1] and Carlos E. Yeguez[2]

Abstract

Objective: Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) A-criteria for ADHD were expanded to include new descriptors referencing adolescent and adult symptom manifestations. This study examines the effect of these changes on symptom endorsement in a sample of adolescents with ADHD (N = 259; age range = 10.72-16.70). Method: Parent ratings were collected and Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR) and DSM-5 endorsement of ADHD symptoms were compared. Results: Under the DSM-5, there were significant increases in reported inattention, but not hyperactivity/impulsivity (H/I) symptoms, with specific elevations for certain symptoms. The average adolescent met criteria for less than one additional symptom under the DSM-5, but the correlation between ADHD symptoms and impairment was attenuated when using the DSM-5 items. Impulsivity items appeared to represent adolescent deficits better than hyperactivity items. Results were not moderated by demographic factors. Conclusion: In a sample of adolescents with well-diagnosed DSM-IV-TR ADHD, developmental symptom descriptors led parents to endorse slightly more symptoms of inattention, but this elevation is unlikely to be clinically meaningful. (J. of Att. Dis. XXXX; XX(X) XX-XX)

Keywords

DSM-5, adolescents, diagnosis

A chief concern with the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) criteria for ADHD is the appropriateness of these symptoms for adolescents and adults. As individuals with ADHD move through the adolescent and adult years, their *DSM* symptom severity appears to diminish (Fischer, Barkley, Fletcher, & Smallish, 1993; Hart et al., 1995; Molina et al., 2009; Willoughby, 2003), despite often mounting functional impairments (Barkley, Murphy, & Fischer, 2008; Molina et al., 2009; Wolraich et al., 2005). For example, despite meeting criteria for fewer *DSM* symptoms of ADHD in adolescence and adulthood (Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a; Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b), older individuals with ADHD are prone to serious problems with the law (Barkley et al., 2008; Mannuzza, Klein, & Moulton, 2008), drug and alcohol addiction (Charach, Yeung, Climans, & Lillie, 2011; Lee, Humphreys, Flory, Liu, & Glass, 2011), significant academic and work-related impairments (Barbaresi, Katusic, Colligan, Weaver, & Jacobsen, 2007; Kent et al., 2011; Kuriyan et al., 2013), and interpersonal difficulties (Bagwell, Molina, Pelham, & Hoza, 2001).

In the face of this contradiction, there is evidence that some ADHD symptoms may be developmentally inappropriate for older individuals (Conners, Sitarenios, Parker, & Epstein, 1998; Molina, Smith, & Pelham, 2001; Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a; Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b). The *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) predominantly describes childhood manifestations of the disorder (e.g., running about and climbing on furniture, leaving one's seat in the classroom; APA, 2000), although some symptoms are developmentally ubiquitous (e.g., difficulty sustaining attention, avoiding tasks that require mental effort). It is likely that diagnostic informants sometimes fail to recognize impairing ADHD symptoms in adolescents and adults due to changes in symptom expression that are not specified in the *DSM* (Faraone, Biederman, & Spencer, 2010; Fedele, Hartung, Canu, & Wilkowski,

[1]Florida International University, Miami, USA
[2]University of Michigan, Ann Arbor, USA

Corresponding Author:
Margaret H. Sibley, Assistant Professor of Psychiatry and Behavioral Health, Florida International University, Center for Children and Families, AHC-1 Room 146, 11200 SW 8th Street, Miami, FL 33199, USA.
Email: msibley@fiu.edu

2010; Kessler et al., 2010). For example, an older individual may no longer have difficulty playing quietly, but may exhibit difficulty modulating his or her tone of voice when excited. When older individuals fail to exhibit childlike ADHD symptoms, some no longer meet diagnostic criteria (Barkley, Fischer, Edelbrock, & Smallish, 1990; Gittelman, Mannuzza, Shenker, & Bonagura, 1985; Hill & Schoener, 1996), creating the misconception that ADHD is less prevalent in adolescents and adults (Barkley, Fischer, Smallish, & Fletcher, 2002; Hart et al., 1995; Kessler et al., 2005; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1998; Mannuzza, Klein, & Moulton, 2003; Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a; Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b).

To address developmental insensitivity, the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013) ADHD criteria are supplemented with examples of symptom manifestation in older individuals (APA, 2013). This modification is face valid and may improve the ADHD diagnostic criteria for adolescents and adults. Despite reduced symptom endorsement in older individuals, research supports the validity of the *DSM-IV-TR* symptoms for adolescents and adults (Barkley et al., 2008; Fischer et al., 1993; Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a; Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b). For example, there is evidence that the *DSM-IV-TR* ADHD symptoms possess greater diagnostic specificity than several sets of alternatively posited non-*DSM* ADHD symptoms for older individuals. Specifically, the *DSM-IV-TR* items appear to outperform novel adult-specific symptoms in their ability to distinguish true ADHD cases from non-ADHD controls (Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b). Thus, retaining the 18 *DSM-IV-TR* symptoms in the *DSM-5* and pairing them with developmental descriptors is an empirically informed approach that may optimize ADHD diagnosis across the life span. However, there is yet to be validation of this method.

The current investigation examines the effect of the *DSM-5* developmental descriptors on symptom endorsement rates in a sample of adolescents with systematically diagnosed *DSM-IV-TR* ADHD. Parent symptom ratings were collected for adolescents with ADHD enrolled in two ongoing clinical trials ($N = 259$) and *DSM-IV-TR* and *DSM-5* endorsement of ADHD symptoms were compared at dimensional and item levels. We hypothesized that adolescents would meet criteria for a significantly greater number of ADHD symptoms under the *DSM-5* criteria and those *DSM-5* symptoms would relate more strongly to adolescent impairment than *DSM-IV-TR* symptoms. We also hypothesized that the *DSM-5* descriptors would lead to significant increases in individual symptom endorsement rates, particularly for hyperactivity/impulsivity (H/I) items. However, we hypothesized that compared with *DSM-5* hyperactivity symptoms, initially proposed (but not published; www.dsm5.org) *DSM-5* impulsivity items would be endorsed at higher rates and relate more closely to adolescent impairment. Finally, we explored whether increased item endorsement under the *DSM-5* was associated with demographic characteristics (age, sex, race/ethnicity, and parent education level).

Method

Participants

The current study combines data from two samples of adolescents diagnosed with *DSM-IV-TR* ADHD ($N = 259$) who participated in federally funded research trials at a large university research clinic in urban South Florida. In both studies, participants were required to (a) meet *DSM-IV-TR* diagnostic criteria for ADHD (APA, 2000), (b) be enrolled in school, (c) have an estimated IQ of 80 or higher, and (d) have no history of an autism spectrum disorder. Both randomized controlled trials evaluated a psychosocial treatment for adolescents with ADHD (Summer Treatment Program-Adolescent; Sibley et al., 2011; Supporting Teens' Academic Needs Daily, Sibley et al., 2013). Table 1 provides demographic and clinical characteristics of the combined samples.

Procedures

Recruitment and intake procedures were similar in both studies. Study participants were recruited through direct school mailings and parent inquiries at the university research clinic. For all potential participants, the primary caretaker was administered a brief phone screen containing the *DSM-IV-TR* ADHD symptoms and questions about functional impairment. Families were invited to an intake assessment to determine study eligibility if the parent endorsed on the phone screen: (a) a previous diagnosis of ADHD *or* six or more symptoms of either inattention or H/I (APA, 2000) *and* (b) clinically significant problems in daily life functioning (at least a "3" on a "0-6" impairment scale; Fabiano et al., 2006).

At an intake assessment, informed parental consent and youth assent were obtained. The primary caretaker participated in the assessment, but when available, other parents were encouraged to provide supplemental information. During the assessment, ADHD diagnosis was assessed through a combination of parent structured interview (Computerized Diagnostic Interview Schedule for Children; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) and Parent and Teacher Rating Scales (Pelham, Gnagy, Greenslade, & Milich, 1992), as is the standard and recommended practice in the field (Pelham, Fabiano, & Massetti, 2005). In addition, the clinician administered a brief

Table 1. Demographic and Diagnostic Characteristics of the Sample.

Demographic	
Age, *M* (*SD*)	12.85 (1.36)
Sex (%)	
Male	69.5
Female	30.5
Race/ethnicity (%)	
Non-Hispanic White	7.4
Hispanic Any Race	77.8
Black	11.3
Mixed Race	3.5
Highest parent education level	
High school or less	20.8
Some college or technical training	22.0
Bachelor's degree	36.0
Master's degree or higher	21.2
Single parent household (%)	38.6
Diagnostic	
Estimated Full Scale IQ, *M* (*SD*)	97.63 (12.24)
Reading Achievement Standard Score, *M* (*SD*)	99.62 (13.35)
Math Achievement Standard Score, *M* (*SD*)	96.75 (16.52)
DSM-IV-TR ADHD diagnosis (%)	
ADHD-PI	37.5
ADHD-C	62.1
ADHD-PH/I	0.40
LD (%)	16.1
ODD (%)	39.8
CD (%)	9.0
Current ADHD medication (%)	39.4

Note. DSM-IV-TR = Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.); ODD = Oppositional Defiant Disorder; CD = Conduct Disorder; ADHD-PI = ADHD- Predominantly Inattentive Type; ADHD-C = ADHD Combined Type; ADHD-PH/I = ADHD Predominantly Hyperactive/Impulsive Type.

intelligence test (Wechsler Abbreviated Scale of Intelligence–II; Wechsler, 2011a), achievement testing (Wechsler Individual Achievement Test–III; Wechsler, 2011b), and a standard rating scale battery. Ratings were obtained directly from a core academic teacher after the parent signed a release of information for the school. Cross-situational impairment was assessed by examining parent and teacher impairment ratings and school grades obtained from official report cards. Impairment was defined as (a) parent and teacher endorsement of impairment on the Impairment Rating Scale ("3" or higher on 7-point scale; Fabiano et al., 2006) and (b) academic impairment present in assignment-level school grades (e.g., failing to turn-in greater than 20% of assignments during the last month in at least one class or possessing a grade of D or F during the last month in at least one class). Dual clinician review was conducted by doctoral level psychologists to determine diagnosis and study eligibility. When disagreement occurred, a third psychologist was consulted. After attending the intake assessment, seven potential participants were excluded for the following reasons: IQ < 80 (n = 2), insufficient functional impairment (n = 4), and symptoms better explained by another mental disorder (n = 1). All data for the current study were obtained as part of each trial's standard rating scale battery. The *Disruptive Behavior Disorders* (DBD) and the *DSM-5* scales were administered to parents in the same sitting. The *DSM-IV-TR* rating scale appeared prior to the *DSM-5* rating scale in the assessment battery.

Measures

DSM-IV-TR *ADHD symptoms.* Parent report of the adolescent's *DSM-IV-TR* ADHD symptoms was obtained using the *DBD Rating Scale* (DBD; Pelham et al., 1992). The DBD lists the *DSM-IV-TR* symptoms of ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD). Parents were asked to provide ratings of (0) *not at all*, (1) *just a little*, (2) *pretty much*, or (3) *very much* for each symptom on the scale. The psychometric properties of the DBD Rating Scale are very good in both child and adolescent samples, with empirical support for distinguishing inattention, H/I, ODD, and CD factors, and internally consistent subscales with alphas above .95 (Evans et al., 2013; Molina et al., 2001; Pelham et al., 1992; Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a). A symptom was considered to be present if it was rated as (2) *pretty much* or (3) *very much*. Inattention and H/I symptom counts were calculated by adding the total number of symptoms endorsed by the parent on each index.

DSM-5 *ADHD symptoms*. To measure *DSM-5* ADHD symptoms, the *DSM-5* ADHD Rating Scale was administered to parents (developed for the purpose of this study). This measure includes a listing of each of the 18 *DSM-5* ADHD symptoms, as they were listed on the dsm5.org website prior to *DSM-5* publication (www.dsm5.org; APA, 2013). In addition, this measure included four impulsivity items that were proposed for the *DSM-5*, but not published in the final version (www.dsm5.org). Items included age-specific symptom descriptors when present (APA, 2013). Responses on the *DSM-5* ADHD Rating Scale were on the same 0 to 3 scale as the DBD: (0) *not at all*, (1) *just a little*, (2) *pretty much*, or (3) *very much*. As with the DBD, a symptom was counted as present if the respondent endorsed (2) *pretty much* or (3) *very much*. Inattention and H/I symptom counts were calculated using the same procedure as the DBD.

For *DSM-5* analyses, an index of impulsivity was represented by three impulsivity items included in the *DSM-5* and four additional impulsivity symptoms that were proposed for, but not included, in the published *DSM-5*. For comparison purposes, an index of *DSM-5* hyperactivity consisted of the six published *DSM-5* hyperactivity

symptoms. A proportional score was calculated for these two dimensions, representing the percentage of symptoms on the dimension that were endorsed by parents.

Functional impairment. To measure an adolescent's level of functional impairment, the Impairment Rating Scale (IRS) was administered to parents (Fabiano et al., 2006). Parents indicated the adolescent's impairment severity in seven domains by marking an X on a line representing the continuum from "no problem" to "extreme problem." Responses were coded 0 (no impairment) to 6 (extreme impairment). The overall impairment item ("the overall severity of this child's problems in functioning and overall need for additional treatment") served as a measure of global impairment in correlational analyses. The IRS demonstrates strong psychometrics and accurately identifies impairment in children and adolescents with ADHD across settings and informants (Evans et al., 2013; Fabiano et al., 2006).

Analytic Plan

All analyses were performed in SPSS Version 20. Using the general linear model (GLM), we evaluated whether the new *DSM-5* symptom descriptors increased the total number of ADHD symptoms endorsed by parents. Separate models were evaluated for inattention and H/I. The within-subject variable was *DSM* edition (*DSM-IV-TR* vs. *DSM-5*). Total changes in symptom endorsement were also examined categorically. A second GLM was conducted to assess whether demographic factors (age, sex, race/ethnicity, parent education level) were associated with changes in symptom endorsement when developmental descriptors were added. In this model, total ADHD symptom count was the dependent measure, the within-subjects factor was *DSM* edition (*DSM-IV-TR* vs. *DSM-5*), and the independent variables were age, sex (0 = female, 1 = male), race/ethnicity (0 = Hispanic, 1 = White/Non-Hispanic, 2 = African American, 3 = Mixed Race), and parent education level (1 = high school or less, 2 = some college or technical training, 3 = bachelor's degree, 4 = graduate or professional degree). Pearson's bivariate correlations were obtained between overall functional impairment and *DSM-IV-TR* and *DSM-5* inattention and H/I symptoms. A two-tailed Hotelling's *t* test was employed to compare the functional impairment correlations for the *DSM-IV-TR* versus *DSM-5*.

Symptom endorsement rates were also directly compared for 18 corresponding *DSM-IV-TR* and *DSM-5* symptom pairs. McNemar's chi-square test of marginal probability was used to compare item endorsement rates using an SPSS Macro (Newcombe, 1998). Odds ratios for the McNemar's test were calculated by obtaining the proportion of discordant cases with positive *DSM-5* endorsement and negative *DSM-IV-TR* endorsement to discordant cases with negative *DSM-5* endorsement and positive *DSM-IV-TR* endorsement. To correct for multiple comparisons, alpha level was set at $p < .003$ for these analyses.

Finally, using the GLM, we examined whether parents were more likely to endorse *DSM-5* symptoms of hyperactivity than impulsivity in adolescents. The within-subject variable was symptom dimension (hyperactivity vs. impulsivity). In addition, Pearson's bivariate correlations were obtained between overall functional impairment and the *DSM-5* hyperactivity and impulsivity indices. A two-tailed Hotelling's *t* test was employed to ascertain the extent to which hyperactivity symptoms versus impulsivity symptoms more strongly correlated with functional impairment.

Results

Overall Symptom Endorsement

Compared with the *DSM-IV-TR* criteria ($M = 5.81$, $SD = 3.03$), parents of adolescents with ADHD reported significantly more symptoms of inattention using the revised *DSM-5* symptoms, $M = 6.38$, $SD = 3.12$, $F(1, 239) = 21.87$, $p < .001$, $d = .19$. There was no significant difference in parental symptom endorsement for H/I; *DSM-IV,* $M = 3.05$, $SD = 2.70$; *DSM-5,* $M = 3.18$, $SD = 3.14$, $F(1, 240) = 1.77$, $p = .19$, $d = .05$. Overall, the *DSM-5* developmental descriptors increased parents' symptom endorsement by an approximate average of .5 symptoms per adolescent. Under the *DSM-5*, 4.2% of adolescents met criteria for 4+ fewer symptoms, 22.9% for 1 to 3 fewer symptoms, 19.6% for equal symptoms, 43.3% for 1 to 3 additional symptoms, and 10.0% for 4+ additional symptoms. Based on parent reports alone, there were six individuals (2.3% of the sample) who met symptom criteria for ADHD under the *DSM-IV-TR* but not the *DSM-5*. There were an additional 28 individuals (10.8% of the sample) who did not meet symptom criteria under the *DSM-IV-TR* using parent reports alone, but did under the *DSM-5*.

Demographic Predictors of Symptom Endorsement Changes

In the demographic prediction model, the interaction terms for *DSM* edition by age, $F(1, 219) = .03$, $p = .87$, sex, $F(1, 219) = .06$, $p = .80$, race/ethnicity, $F(1, 219) = 1.40$, $p = .24$, and parent education level, $F(1, 219) = 1.85$, $p = .14$, were non-significant, indicating that changes in symptom endorsement when adding the developmental descriptors were not associated with any demographic variable.

Relationship With Functional Impairment

The *DSM-IV-TR* inattention symptoms possessed a significantly stronger relationship with overall impairment ($r = .46$) than the *DSM-5* inattention symptoms ($r = .39$, $t = 2.06$,

Table 2. *DSM-5* Inattention Symptom Endorsement Rates Compared With *DSM-IV-TR*.

	DSM-5 (%)	*DSM-IV-TR* (%)	χ^2	OR
Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).	76.6	73.2	1.39	1.42
Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or reading lengthy writings).	79.9	60.7	33.06*	6.11
Often does not seem to listen when spoken to directly (mind seems elsewhere, even in the absence of any obvious distraction).	58.2	49.4	7.74†	2.17
Frequently does not follow through on instructions (starts tasks but quickly loses focus and is easily sidetracked, fails to finish schoolwork, household chores, or tasks in the workplace).	77.7	70.2	7.71†	2.50
Often has difficulty organizing tasks and activities (Has difficulty managing sequential tasks and keeping materials and belongings in order. Work is messy and disorganized. Has poor time management and tends to fail to meet deadlines).	73.9	73.1	0.11	1.11
Characteristically avoids, seems to dislike, and is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework, or for older adolescents and adults, preparing reports, completing forms, or reviewing lengthy papers).	71.5	64.0	9.00*	3.00
Frequently loses objects necessary for tasks or activities (e.g., school assignments, pencils, books, tools, wallets, keys, paperwork, eyeglasses, or mobile telephones).	63.6	58.2	5.83†	2.63
Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).	70.0	67.9	0.61	1.28
Is often forgetful in daily activities, chores, and running errands (for older adolescents and adults, returning calls, paying bills, and keeping appointments).	67.2	65.1	0.64	1.29

Note. *DSM-5* = *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.); *DSM-IV-TR* = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.); OR = odds ratio.
†$p < .05$. *$p < .003$.

$p < .05$). The *DSM-IV-TR* ($r = .24$) and *DSM-5* H/I symptoms ($r = .27$) did not differ significantly in the strength of their relationship with overall impairment ($t = .95$, $p > .25$).

Symptom-Level Endorsement Rates

Tables 2 and 3 present the symptom endorsement rates for each of the *DSM-5* ADHD symptoms, compared with the *DSM-IV-TR* symptoms. After correcting for multiple comparisons ($p < .003$), two inattention symptoms were endorsed at significantly higher rates when the *DSM-5* developmental descriptors were added: (a) difficulty sustaining attention and (b) avoiding tasks that require sustained mental effort. Three additional symptoms possessed marginally significant ($p < .05$) endorsement differences between the *DSM-IV-TR* and *DSM-5* items: (a) not seeming to listen when spoken to, (b) not following through on instructions, and (c) frequently losing objects. Similarly, one H/I symptom was endorsed at a significantly ($p < .003$) higher rate using the *DSM-5* descriptors: difficulty remaining seated. Another symptom (is often excessively loud) was marginally significant ($p < .05$). No symptoms were endorsed at significantly lower rates using the *DSM-5* criteria.

DSM-5 *Hyperactivity Versus Impulsivity Symptoms*

Compared with the hyperactivity symptoms ($M = .34$, $SD = .36$), the impulsivity symptoms were endorsed at significantly higher rates by parents of adolescents with ADHD, $M = .41$, $SD = .37$, $F(1, 239) = 17.14$, $p < .001$, $d = .19$. The impulsivity symptoms possessed a marginally stronger relationship with overall impairment ($r = .29$) than the hyperactivity symptoms ($r = .21$, $t = 1.94$, $p = .06$).

Discussion

When the *DSM-5* descriptors were included, our data suggested that a slim majority of adolescents with *DSM-IV-TR* diagnosed ADHD (53.3%) experienced an increase in the number of symptoms endorsed by their parents. More specifically, these findings demonstrated (a) a statistically significant increase in total number of reported inattention, but

Table 3. *DSM-5* Hyperactivity/Impulsivity Symptom Endorsement Rates Compared With *DSM-IV-TR*.

	DSM-5 (%)	*DSM-IV* (%)	χ^2	OR
Often fidgets or taps hands or feet or squirms in seat.	46.9	48.5	0.76	0.96
Is often restless during activities when others are seated (may leave his or her place in the classroom, office, or other workplace, or in other situations that require remaining seated).	38.4	29.1	11.26*	2.92
Often runs about or climbs on furniture and moves excessively in inappropriate situations. In adolescents or adults, may be limited to feeling restless or confined.	18.4	15.1	2.13	1.73
Is often excessively loud or noisy during play, leisure, or social activities.	28.5	21.8	4.92†	1.89
Is often "on the go," acting as if "driven by a motor." Is uncomfortable being still for an extended time, as in restaurants, meetings, and so on. Seen by others as being restless and difficult to keep up with.	27.8	27.8	0.00	1.00
Often talks excessively.	42.1	44.2	0.71	0.75
Often blurts out an answer before a question has been completed. Older adolescents or adults may complete people's sentences and "jump the gun" in conversations.	40.6	40.6	0.00	1.00
Has difficulty waiting his or her turn or waiting in line.	30.3	30.7	0.03	0.94
Often interrupts or intrudes on others (frequently butts into conversations, games, or activities; may start using other people's things without asking or receiving permission, adolescents or adults may intrude into or take over what others are doing).	46.2	50.0	1.80	0.67

Note. DSM-5 = Diagnostic and Statistical Manual of Mental Disorders (5th ed.); *DSM-IV-TR = Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.); OR = odds ratio.
†$p < .05$. *$p < .003$.

not H/I, symptoms (b) that *DSM-IV-TR* inattention symptoms were more closely related to overall functional impairment than *DSM-5* inattention symptoms, (c) that compared with hyperactivity items, impulsivity items were endorsed at higher rates by parents and related more closely to adolescent impairment, and (d) that there were statistically significant item level increases in endorsement of three individual symptoms (difficulty sustaining attention, avoiding tasks that require sustained mental effort, and difficulty remaining seated). Overall, the average adolescent met criteria for less than one additional ADHD symptom under the *DSM-5* wording. Thus, for the average adolescent with *DSM-IV-TR* diagnosed ADHD, adding age-appropriate descriptors to the *DSM* criteria did not lead to *clinically meaningful* increases in symptom endorsement.

Surprisingly, the slight elevation in symptom endorsement arose from the inattention factor—H/I symptom endorsement was generally unchanged when symptom descriptors were added. Previous work suggests that *DSM* inattention symptoms are psychometrically sound for adolescents, while H/I symptoms may function problematically (Conners et al., 1998; Molina et al., 2001; Sibley, Pelham, Molina, Gnagy, Waschbusch, et al., 2012a). In our study, the developmental descriptors did not improve parents' overall ability to recognize additional H/I symptoms in their adolescent children. Although hyperactivity items compose the majority of the H/I symptom criteria (6 out of 9), some evidence suggests that ADHD is more frequently characterized by impulsivity in adolescence (Wolraich et al., 2005). Thus, it is possible that endorsement rates did not increase because hyperactivity symptoms truly decline in adolescence, regardless of how they are described. Our investigation of proposed *DSM-5* impulsivity items further supports a recession of hyperactivity symptoms in adolescence. Compared with impulsivity symptoms, hyperactivity symptoms were less likely to be endorsed by parents and were not as strongly related to adolescent impairment.

Despite meager changes in overall symptom endorsement, 53.3% of adolescents displayed increased endorsement of at least one ADHD symptom, compared with 27.1% who exhibited decreased endorsement. Diagnostic prevalence of ADHD is associated with demographic factors such as age, gender, race/ethnicity, and socioeconomic status (Centers for Disease Control, 2013; Gaub & Carlson, 1997; Hart et al., 1995), signaling the possibility that *DSM* symptoms are differentially endorsed by individuals with certain characteristics. However, none of these demographic variables was associated with increased endorsement in the presence of the *DSM-5* developmental descriptors. Thus, the associated small increases when developmental descriptors were added may be generic to adolescence and reflect qualitative changes in symptom presentation after the start

of puberty. Conversely, increased symptom endorsement using the *DSM-5* descriptors may not be specific to adolescence; it may be the case that these new labels uniformly increase symptom prevalence in children, adolescents, and adults. Further work is needed to understand whether the slight symptom increases documented in this article are global or affect certain populations differentially.

Compared with *DSM-IV-TR* symptoms, the *DSM-5* symptoms of inattention (but not H/I) were not as strongly related to an adolescent's overall functional impairment (difference $r = -.07$). Accordingly, the *DSM-5* symptom descriptors may reference less pathological behaviors, attenuating the relationship between symptom and impairment severity. This finding is similar to a previous one (Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012b) suggesting that impairment indices correlate more strongly with *DSM-IV-TR* ADHD symptoms than novel adult-specific ADHD items. Both of these studies highlight a critical issue in the characterization of adolescent and adult ADHD: without empirical item testing, symptom descriptors may reference behaviors that are not core elements of the disorder. As such, our data highlight the importance of evaluating the *DSM-5* symptom wording with a sample of adolescents without *DSM-IV-TR* diagnosed ADHD, to better understand how these descriptors may function in subclinical and typically developing populations.

Although the *DSM-5* symptom descriptors were not associated with marked overall symptom elevation, isolated symptoms increased in prevalence. The largest increase in symptom endorsement occurred for the symptom "difficulty sustaining attention" (19.2% increase; see Table 2). Whereas the *DSM-IV-TR* symptom offered no behavioral examples, the *DSM-5* descriptor specified that focus might be lost in during reading, lectures, and conversations. It may be the case that these examples were needed to clarify the symptom's meaning for some parents. Five additional symptoms, most notably, "avoids sustained mental effort" and "difficulty remaining seated" also displayed noteworthy increases in endorsement using the descriptors (5.4%-9.3% increase; see Tables 2 and 3). These data highlight that under certain circumstances, these developmental examples may influence endorsement rates in adolescents.

There are several important limitations to the current study. First, there were semantic changes to the wording of the *DSM-5* symptoms between the dsm5.org listed criteria and the published *DSM-5* (see Tables 2 and 3; APA, 2013). Although these differences do not appear to affect the meaning of the descriptors (e.g., substituting the term "frequently" with "often" or "reading lengthy writings" with "lengthy readings"), it is possible that these modifications influenced a parent's symptom endorsement. Second, we did not counterbalance the order in which the DBD and *DSM-5* scales were administered. There is some evidence to suggest that during structured interviews, endorsement diminishes for ADHD symptoms queried later in an interview (Jensen, Watanabe, & Richters, 1999). Although it is unclear if this order effect extends to rating scales, it is possible that *DSM-5* endorsement rates may be consequently underestimated. In addition, our sample is treatment-referred and predominantly working and middle-class Hispanic. Thus, some of our findings may not generalize to the entire population of adolescents with ADHD. Similarly, our results most likely do not apply to adults, who display the vastest disparity in ADHD symptom endorsement from childhood.

There are important next steps in the validation of the *DSM-5* symptom criteria for older individuals. First, the current analyses suggest that the *DSM-5* items appropriately detect ADHD symptoms in adolescents with well-diagnosed *DSM-IV-TR* ADHD. It will also be necessary to further validate the *DSM-5* symptoms using samples containing individuals who do not meet criteria for *DSM-IV-TR* ADHD. Our results also suggest that a greater emphasis on impulsivity items in the *DSM* may improve clinically significant symptom detection. However, more thorough analysis of this question is necessary, including comparative evaluation of impulsivity items in ADHD and non-ADHD samples. Most importantly, if future versions of the *DSM* include greater emphasis on impulsivity symptoms for older individuals, it is imperative that symptom thresholds are subsequently adjusted to address an increase in the number of *DSM* symptoms. In addition, the average age of the current sample was approximately 13 years old, requiring similar analyses to be conducted using older samples. Similarly, *DSM-5* symptom endorsement rates should also be evaluated for teacher and self-report ratings, as the new descriptors may offer differential utility for these informants. Finally, the specificity of these items—their ability to discriminate ADHD and non-ADHD cases—remains untested.

Overall, these analyses suggest that developmental symptom descriptors possess only a slight influence on the diagnosis of ADHD in adolescents who meet criteria for the disorder under the *DSM-IV-TR*. However, it is possible that additional *DSM-5* changes influence diagnostic prevalence rates. The diagnostic impact of *DSM-5* changes to age of onset, impairment, and differential diagnosis criteria (APA, 2013) is yet to be evaluated. It is most crucial to understand the *combined* influence of all *DSM-5* changes on diagnostic prevalence and symptom endorsement. It is our hope that continued work investigates the symptom presentation of ADHD in adolescence, to guide the development of age-appropriate assessment and treatment methods.

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Author Biographies

Margaret H. Sibley, PhD, is an Assistant Professor of Psychiatry & Behavioral Health at Florida International University. She is director of the STAND program, which aims to improve the functioning of adolescents with ADHD through increase access to effective mental health care.

Carlos E. Yeguez is an undergraduate psychology major at the University of Michigan.