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Comparison of the DSM-IV combined and inattentive types of ADHD in a school-based sample of Latino/Hispanic children

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Background: The aim of this investigation was to examine the construct validity and distinctiveness of the inattentive type (IT) and combined type (CT) of Attention-Deficit/Hyperactivity Disorder (ADHD) in a Latino/Hispanic sample. **Method:** A comprehensive assessment was conducted with a clinically diagnosed school-based sample of 98 children aged 6 to 11 (CT = 44; IT = 25; control group = 29). **Results:** Both ADHD groups were impaired on academic achievement measures, presented more ADHD-type behaviors during math and vigilance tasks, and exhibited greater internalizing symptoms. The IT group had a later onset of inattention symptoms, presented more sluggish cognitive tempo symptoms, was less prone to initiate social interactions or to be assertive and more self-controlled in social interchanges, was less likely to have externalizing behaviors, had mothers who reported less child-related family stress, and was less impaired in their adaptive functioning. **Conclusions:** Findings supported the construct validity of ADHD in this culturally different sample and suggested that the CT and IT represent distinct disorders. **Keywords:** ADHD, inattentive and combined subtypes, Latino, Hispanic. **Abbreviations:** ADHD SS-SRF: ADHD Symptoms Scale – Self-Report Form; AI: Activity-Impulsivity; BDI: Beck Depression Inventory–Spanish; BGT: Bender-Gestalt Test; CGAS: Children's Global Assessment Scale–Spanish; CPT: Conners' Continuous Performance Test; DBRS: Disruptive Behavior Rating Scale; DISC-IV: Diagnostic Interview Schedule for Children IV; DM: Distraction-Motivation; FEI: Family Experiences Inventory; HSQ: Home Situations Questionnaire; IATQ: It's About Time Questionnaire; PPI: Parent Practices Inventory; SBI: School Behavior Inventory; SCT: sluggish cognitive tempo; SSQ: School Situations Questionnaire; SSSQ: Spanish Social Skills Questionnaire; WPB-S: Woodcock Psychoeducational Battery–Spanish.

Attention-Deficit/Hyperactivity Disorder (ADHD) is a heterogeneous disorder. This has led clinicians and researchers to examine the usefulness of subdividing the disorder into more homogenous subtypes. In the *Diagnostic and Statistical Manual of Mental Disorders – 4th Edition* (DSM-IV; American Psychiatric Association [APA], 1994), ADHD is subtyped based on the predominance of impairing symptoms of inattention (inattentive type [IT]), of hyperactivity-impulsivity symptoms (hyperactive-impulsive type [HIT]), or on both sets of symptoms (combined type [CT]). The validity of these subtypes has been the subject of many studies, particularly for the CT and IT, which for many years have been viewed not as subtypes of ADHD but as different disorders (Milich, Ballentine, & Lynam, 2001).

In studies with clinic-referred children, the CT has been found to present earlier age of symptom onset (e.g., Faraone, Biederman, Weber, & Russell, 1998). Regarding patterns of comorbidity, the CT presented higher rates of oppositional defiant disorder (ODD) and conduct disorder (CD) or more externalizing problems than the IT in both clinic and school-based samples (Carlson & Mann, 2000; Lahey & Willcutt, 2002). The pattern of comorbidity with internalizing problems is not as clear-cut (Milich et al., 2001). In school-based samples, children with the CT presented higher teacher ratings of anxious-depressed and generalized anxiety behaviors (Gaub & Carlson, 1997; Nolan, Gadow, & Sprafkin, 2001). In contrast, clinic-referred children with the CT and IT did not differ on teacher or parent ratings of anxious/depressed symptoms nor in their rates of internalizing disorders (Eiraldi, Power, & Nezu, 1997; Faraone et al.)

When social functioning is examined, the CT received higher teacher ratings of social problems and peer dislike in school-based studies. In clinical studies, however, this difference among subgroups is not consistently found (Carlson & Mann, 2000). Similarly, no consistent significant differences have been found between clinic-referred children with the CT and IT on cognitive and academic achievement tests, although both tend to have poorer performance than controls. These differences have not been studied in school-based samples (Carlson & Mann, 2000). When considering attentional style, studies with clinic-referred (McBurnett, Pfiffner, & Frick, 2001) and school-based (Carlson & Mann, 2002) samples have indicated that inattention

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symptoms termed 'sluggish cognitive tempo' (SCT) have a stronger association with the IT.

Although no formal theory of the IT currently exists, research findings reviewed suggest that this type, or at least a subgroup of it, is characterized by a pattern of SCT symptoms or inconsistent alertness and orientation, passivity, relative absence of deficient response inhibition, error-prone information processing, and impaired focused or selective attention (Barkley, 1998; McBurnett et al., 2001). The findings reported for the CT, on the other hand, are consistent with Barkley's (1998) theory which posits that this ADHD type is characterized by deficits in response inhibition that appear early in development and problems with resistance to distraction and persistence of effort.

It is important to note that the literature review on the validity of the DSM-IV ADHD types indicates that the studies in which children were diagnosed as CT or IT were done with clinical samples, which are subject to treatment referral bias (Carlson & Mann, 2000; Lahey & Willcutt, 2002). Children recruited from mental health clinics can be systematically different in terms of impairment, comorbidity, and other relevant variables from the larger population of youth with psychiatric disorders (Goodman et al., 1997). More severe psychopathology in clinical samples can mask ADHD type differences that might be identified in the general population (Faraone et al., 1998). In contrast, school-based studies are not subject to this type of bias since the sampling frame is not children under treatment. However, in these studies only symptom cutoff points, and not other diagnostic criteria, were considered. This strategy may result in more heterogeneous samples than in studies using diagnostic interviews, which in turn provide more accurate and clinically meaningful diagnoses.

Also, in the studies reviewed no information was provided to assess the magnitude of the difference on the number of inattention and hyperactivity-impulsivity symptoms present in those with the IT. It is possible that children in the latter group who present 6 or more symptoms of inattention and 5 of hyperactivity-impulsivity are actually subthreshold cases of the CT (McBurnett et al., 2001). Interestingly, none of those studies compared the two subtypes in terms of parenting practices, child-related family stress, and other family functioning variables. In addition, most of them were conducted with participants of Anglo European-American descent, which may limit the extension of the findings to other national/ethnic groups.

In view of the previous research and given the importance of examining the validity of the ADHD construct in a linguistically and culturally different context, we examined the distinctiveness of the IT and the CT in Latino/Hispanic children recruited from schools. Participants were screened by teacher ratings, but clinically diagnosed according to DSM-IV criteria and independently evaluated on clinical, psychoeducational, behavioral and family functioning measures. Postulated differences on attentional style (Barkley, 1998; McBurnett et al., 2001) led us to hypothesize that the IT would present a larger number of SCT symptoms than the CT. The proposed inhibitory deficit in the latter type (Barkley, 1998) led us to predict that the IT would present significantly fewer externalizing behavior problems, less global impairment, less child-related family stress, and less social impairment than the CT group. Given that problems in inhibition are thought to arise first in development (Barkley, 1998), it was further hypothesized that hyperactivity-impulsivity symptoms would be perceived by parents as preceding the emergence of inattention symptoms. Both groups were expected to be impaired on psychoeducational measures given the potentially impairing qualities of their attentional styles, and to demonstrate greater internalizing symptoms relative to the control group, but no significant differences between them. Finally, no specific hypotheses were advanced as to differences in family relationships or parenting practices among the two types. These variables have not been shown to be directly associated with children with the CT and IT and the behavioral and attentional difficulties of these children have the potential to affect, and be affected by, family and marital relationships, parental involvement, child management, and disciplinary practices (Barkley, 1998).

Method

Participants

A sample of 98 children, aged 6 to 11 years, was recruited from 26 elementary schools in the San Juan Metro Area in Puerto Rico. Participants met the following criteria: have an IQ ≥ 80; be the biological child of a Puerto Rican mother; have not lived in another country for more than two years; no evidence of significant sensory, language, neurological, or pervasive developmental difficulties; and no history of treatment with stimulant or other psychotropic medication prior to 6 months of study participation. Forty-four of them met DSM-IV diagnostic criteria for the CT, 25 for the IT, and 29 did not meet diagnostic criteria for this disorder.

A five-stage procedure was used to select participants. In the first stage, teachers were asked to identify children with attention problems, with and without high levels of activity-impulsivity, whom they had considered in need of referral for assessment or treatment. They were also asked to identify potential control children who did not present inattention, hyperactivity-impulsivity and academic problems. For each child, the teacher completed the Distraction-Motivation (DM) and Activity-Impulsivity (AI) scales of the School Behavior Inventory (SBI; Bauermeister, 1994). During the second stage, informed consent was obtained at school from the mothers of those children with scores on the SBI above or below the cutoff scores established for initial

inclusion in the study (see below). They also completed the Disruptive Behavior Rating Scale (DBRS; Barkley, 1997) and the Child Behavior Checklist (CBCL; Achenbach, 1991a). If a subsequent screening interview and items endorsed from the ADHD subscale of the DBRS and the Attention Problems scale of the CBCL indicated presence (or absence) of mother's complaints of inattention and/or hyperactivity-impulsivity, and supported the behavior pattern for which the child was nominated, the child was considered eligible for the third stage.

At stage three, approximately 4 weeks after the initial screening, research assistants (RAs) interviewed teachers of pre-selected children and administered the full version of the SBI and other questionnaires. Children who received ratings on the DM and AI scales comparable with those received in the first stage were assigned to three groups and scheduled for assessment. The inattentive and hyperactive group ($n = 47$) consisted of children with a score greater than the 93rd percentile on both the DM and AI scales. The inattentive only group ($n = 44$) had a score greater than the 93rd percentile on the DM scale, and below the 69th percentile on the AI scale. These cutoff points effectively separated the ratings on the DM and AI scales by at least one standard deviation. Children in the control group ($n = 29$) had scores below the 84th percentile on the DM and AI scales of the SBI, on total and broadband scales of the SBI and the Teacher Report Form (TRF) of the CBCL (Achenbach, 1991b); no parent or teacher complaints of significant behavior or academic problems; and no history of mental health services as reported by parents.

During the fourth stage, diagnostic assessments of the 120 eligible participants were made by three advanced clinical psychology doctoral students who were blind to the children's pre-diagnostic group membership. Diagnoses were based on information obtained from a structured developmental interview and on Draft no. 4 of the Spanish parent version of the Diagnostic Interview Schedule for Children IV (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Shwab-Stone, 2000). Each DISC-IV item was administered and scored in a structured manner. However, when necessary the interviewers deviated from the standard administration of the DISC-IV and clarified ambiguous responses through further questions and probes. Decisions as to the presence or absence of ADHD hyperactivity-impulsivity and inattention symptoms during the last six months were based on the information provided by mothers on the DISC-IV and the ADHD subscale and on the information provided by teachers on the ADHD subscale and the SBI. When both informants (parents, teachers) disagreed as to the presence of the number of inattention or hyperactivity-impulsivity symptoms required for a diagnosis of CT or IT, more weight was given to teacher reports, unless the responses provided by mothers on the interviews and the instruments administered were more informative. Teachers were felt to be in a better position to identify ADHD symptoms in the classroom and were thought to be generally more knowledgeable of behaviors to be expected in children within the age range studied. Onset before age 7, presence of impairing symptoms in two or more settings, distress or impairment in functioning, and exclusionary criteria were assessed from reports to the DISC-IV. All other diagnoses were based on information obtained from the latter interview and additional probes.

At the final stage, interviewers presented a summary of the child's background and diagnostic data to two senior clinical child psychologists (JJB & MM), who reviewed the information, asked questions, and clarified issues as needed. Following each case presentation, the interviewer and senior clinicians independently provided DSM-IV diagnoses. The mean kappa (k) coefficients between interviewers and clinicians were .90 (CT) and .82 (IT). The mean k for the other study diagnoses was .93. Consensus diagnoses were reached for those cases for which disagreement existed. Of those classified by teachers during the third stage as inattentive and hyperactive, 83% received a diagnosis of ADHD-CT. On the other hand, of those classified as inattentive, 57% were diagnosed as ADHD-IT, and 11% received an ADHD-CT diagnosis. The remaining participants of these two clinical groups ($n = 22$) did not receive an ADHD diagnosis and were excluded. None of the children in the control group received a diagnosis of ADHD, but six received other DSM-IV diagnoses.

Procedures

Following the procedures used by Barkley, DuPaul, and McMurray (1990), mothers and children who met selection criteria were seen on a single day for a 5–6-hour period which included a one-hour lunch recess and rest periods between assessments. The interviews and questionnaires developed for English-speaking participants were translated into Spanish following a cross-cultural adaptation model (Bravo, Woodbury-Fariña, Canino, & Rubio-Stipec, 1993). The dependent measures were collected in a standardized order. They were selected to obtain multiple types of information across multiple domains and from multiple sources. Advanced doctoral psychology students interviewed and administered questionnaires to the mothers and tested the participants. These RAs were blind to the children's pre-diagnostic group membership. Twenty percent of the mothers' interviews were randomly sampled and reviewed by different RAs to evaluate strict adherence to the interview procedures. A stipend of $15.00 and $10.00 was provided to parents and teachers, respectively, for their participation.

Screening and diagnostic measures

School Behavior Inventory (SBI). The SBI (Bauermeister, 1994) is separately normed for Puerto Rican boys and girls aged 6–13. The internal consistency (alpha) of the AI and DM scales for both genders range from .92 to .95 and the test–retest reliability from .77 to .83 over 4 to 6 weeks. For the present sample of 120 eligible participants, alpha coefficients range from .95 to .97. Nine of the 12 AI items and 6 of the 9 DM items correspond to DSM-IV hyperactivity-impulsivity and inattention symptoms, respectively.

Disruptive Behavior Rating Scale (DBRS; Barkley, 1997). The ADHD subscale obtains ratings of the 9 DSM-IV inattention and 9 hyperactivity-impulsivity symptoms, respectively. It was used to assist with selecting the participants. The ODD subscale obtains ratings of the 8 symptoms that define this disorder and was used as a dependent measure. Previous findings indicate that the internal consistency for the Spanish version of the ADHD and ODD scales completed by mothers and teachers ranges from .86 to .93; the test–retest reliability over a 4-week period ranges from .78 to .89. For the present sample, internal consistency ranges from .89 to .96.

Child Behavior Checklist – Parent (CBCL) and Teacher Report Forms (CBCL-TRF). CBCL and TRF (Achenbach, 1991a, 1991b) yield ratings of psychopathological symptoms across a variety of narrow and broad-band dimensions. Both set of scales have satisfactory reliability and validity and have been culturally adapted for use in Puerto Rico. Alpha coefficients for the present sample range from .51 to .97. The Attention Problems scale of the CBCL was used to screen participants and the CBCL-TRF total and broad-band scales were used to assign children to the control group. Other CBCL scales were used as dependent measures (Table 2).

Developmental and Diagnostic Interview. The first part of this interview was designed to evaluate children's medical, socio-emotional, and school histories. The second part consisted of the DISC-IV administered to explore DSM-IV childhood diagnoses (Shaffer et al., 2000). The ADHD, ODD, CD, generalized anxiety disorder, separation anxiety disorder, major depression, disthymia, and bipolar disorder modules were administered. These modules include questions that assess whether the reported symptoms contribute to impairment in the relations of the child with others and in school functioning, and whether the symptoms led the child to feel upset.

Dependent variables

Rating scale measures. Children' s Global Assessment Scale – Spanish (CGAS). CGAS (Bird, Canino, Rubio-Stipec, & Ribera, 1987) yields ratings of children's impairment in adaptive functioning. Scores range from 1 (the most impaired) to 100 (healthiest level). It has excellent test–retest inter-rater reliability and adequate discriminant and concurrent validity for Puerto Rican children. Inter-rater reliability for a subsample of the participants ($n = 34$) is .96.

Examiner ratings of child' s behavior (G. Canino, personal communication, September 1, 1996). Examiners provided an overall rating of the child's level of overactivity, impulsivity, attention span, oppositional defiance, and emotional reactivity during the assessment. Each behavior was rated on a 0 to 2-point scale that provided specific descriptions of the conduct assessed. The examiner rating scale was not available at the beginning of the study. Consequently, ratings were not obtained for the first 24 children assessed.

Home and School Situations Questionnaires (HSQ and SSQ). HSQ and SSQ (Barkley, 1997) measure the presence of child behavior problems across 16 home situations (HSQ) and 12 school situations (SSQ). Scores were obtained for the number of problem settings. Previous findings indicate that the test–retest reliability for the number of problem settings for the Spanish version of the HSQ over a 4-week interval is .87; for the SSQ the reliability is .89.

It's About Time Questionnaire (IATQ; Barkley, Koplowitz, Anderson, & McMurray, 1997). The Spanish version of the IATQ evaluates children's sense of time, their referencing of time in their daily discourse with others, and their ability to conform to directions containing time parameters and to meet deadlines associated with work assignments. Its internal consistency is .88 (previous sample) and .81 (present sample). Barkley et al. (1997) have shown that this instrument distinguishes between groups of ADHD and control children.

Sluggish Cognitive Tempo Scale (SCTS). Mother and teacher versions were developed to measure SCT using CBCL items associated in the research literature with this construct (Carlson & Mann, 2002). The items were: 'confused or seems to be in a fog', 'daydreams or gets lost in his/her thoughts', 'stares blankly', 'underactive, slow moving or lacks energy', and 'apathetic or unmotivated' (the latter was available for the teacher scale only). Alpha coefficients for the mother and teacher SCTS are .83 and .89, respectively (previous sample) and .81 and .88, (present sample).

Spanish Social Skills Questionnaire (SSSQ). The parent and teacher forms of the SSSQ are designed to measure the frequency with which a child exhibits certain social skills needed for successful functioning in class or at home and have adequate reliability and validity (Gresham & Elliot, 1990). The school version provides a total score and scores for Cooperation, Assertion, and Self-Control scales. For Puerto Rican children, the parent version yields scores for the following factor-analytically derived scales: Cooperation, Self-Control, Social Initiative, Social Sensitivity, and Social Judgment. Alpha coefficients of these scales range from .62 to .86 (Martínez, 1999). For the present sample, the coefficients range from .64 to .87 (parent form) and .78 to .93 (teacher form).

Psychoeducational measures. Wechsler Intelligence Scale for Children–Revised for Puerto Rico (WISC-R PR; Herrans & Rodríguez, 1992). This Spanish version of the WISC-R has excellent psychometric properties and has been adapted and normed for Puerto Rican children.

Woodcock Psychoeducational Battery–Spanish (WPB-S; Woodcock, 1982). Tests used from this battery provide a measure of academic achievement in math and reading. The WPB-S was developed for Spanish-speaking children and has adequate reliability.

Spanish Spelling-Test of Reading and Written Language (TRWL; Hammill, Larsen, Wiederholt, & Fountain-Chambers, 1982). This spelling test was developed and normed for Spanish-speaking children aged 8 to 15. The score is the number of words correctly written. The internal consistency for children from fourth to sixth grade ranges from .85 to .88.

Bender-Gestalt Test (BGT; Koppitz, 1975). This test assesses visual motor-integration and was scored using Koppitz's method and norms developed for Puerto Rican children.

Laboratory and behavioral measures. Conners' Continuous Performance Test (CPT; Conners, 1995). This is a 14-minute computerized task used to assess vigilance and impulsiveness. Three scores were used: number of omissions, total commissions, and hit reaction time.

Restricted Academic Situation Behavior Coding System (Barkley et al., 1990). This behavioral observation system measures a child's behavior while completing a math task and during the CPT. In the math task, children were placed alone for 15 minutes in a play therapy room and were instructed to complete as many math problems as possible and not to leave the chair during the task or touch any toys. Their behavior was videotaped and scored during this math task and during the CPT using five behavioral categories: off task, fidgets, out-of-seat, vocalizes, and play with objects. Every 30-sec. the coder checked on the coding sheet whether any of the 5 categories were observed (Barkley et al., 1990). Coders were trained to a level of agreement of 80% and inter-coder reliability was evaluated on 20% of all videotapes selected at random. The coders' mean level of agreement for behavioral observations during the math task and CPT in a subsample of participants ($n = 21$) was 92% and 91%, respectively.

Solid State Actigraph (Ambulatory Monitoring Inc., 1995). This acceleration-sensitive device with solid-state memory stores data on the number of movements a child makes per unit of time. The monitor was worn around the waist inside a pouch attached to a belt. Activity level was assessed with this device during the math task and the CPT.

Mother self-report measures. Beck Depression Inventory–Spanish (BDI). This well-known instrument has been translated and adapted into Spanish with a sample of Puerto Rican adult outpatients and has high internal consistency (Bernal, Bonilla, & Santiago, 1995). The alpha coefficient in the present sample is .92.

Family APGAR–Spanish (Goodman et al., 1998). This consists of 5 items, each of which is a statement of the parent's frequency of satisfaction with an aspect of family relationships. The alpha coefficient reported for the Spanish version of the scale is .86 (.88 in the present sample).

ADHD Symptoms Scale – Self-Report Form (ADHD SS-SRF; Barkley, 1997). It includes the symptoms of ADHD described in the DSM-IV. Mothers rated the frequency of occurrence of these symptoms in themselves during the last 6 months (current symptoms) and during childhood (between ages 5 and 12). Previous research indicate that the internal consistency and test–retest reliability indexes of the Spanish version of the current and childhood symptoms scales range from .74 to .86. In the present sample, the alpha coefficients range from .85 to .91.

Family Experiences Inventory (FEI; Bauermeister, Matos, & Reina, 1999). The FEI was developed to assess stressful experiences associated with the mother–child relationship, social life of the family, mother–child's teacher relationship, family finances, and child–siblings relationship. The internal and test–retest reliability (4- to 6-week period) obtained in a previous study is .93, respectively. For the present sample the internal reliability is also .93.

Parent Practices Inventory (PPI; Salas-Serrano, 2003). PPI assesses parental monitoring and supervision, parental involvement, and parental discipline in general. Previous analyses indicate that both the internal consistency and the test–retest reliability (4–6-week interval) of the PPI are .85. For the present sample, the alpha coefficient is .84.

Other measures

Children were administered a battery of neurocognitive tests addressed to measure time estimation and reproduction, executive functions, memory, and motor skills. Other information was obtained from mothers and teachers concerning their perceptions and experiences in the treatment and management of children with ADHD. The tests and measures used are not described as their results are being reported in other publications.

Results

Analyses of the sample characteristics (Table 1) indicated that the groups did not differ significantly ($p = .12$) on gender, mother's age, parents' education and number of other siblings in the family. Group differences approach significance for child's age ($p = .07$). The mean number of symptoms identified as present by clinicians during the diagnostic process is also summarized in Table 1. All of the children in the IT group presented 4 or fewer clinical hyperactivity-impulsivity symptoms. Consistent with their clinical diagnosis, the two ADHD groups were rated as more inattentive than the control group by both mothers and teachers, but did not differ among themselves. On the other hand, as expected from the group selection criteria, the CT group obtained significantly higher ratings of hyperactivity-impulsivity at home and school than the other groups. The IT was rated as more hyperactive-impulsive than the control group at home but not at school.

Table 1 Sample demographic and symptom characteristics

Measures	Groups			F/χ^2	Contrasts
	ADHD-CT (1)	ADHD-IT (2)	Control (3)		
Participants	44	25	29	–	–
Gender (% Male)	59.1	72.0	48.3	3.13	–
Age	7.84 (1.61)	8.72 (1.37)	8.41 (1.72)	2.70	–
Mother's age	33.00 (6.13)	34.52 (5.97)	35.04 (7.38)	.96	–
Mother's education	12.91 (3.10)	13.96 (1.24)	13.89 (1.83)	2.16	–
Father's education	12.51 (2.47)	12.79 (2.40)	13.21 (1.93)	.77	–
No. siblings	1.52 (.95)	1.27 (.96)	1.21 (.77)	1.23	–
Inattention symptoms	6.80 (.98)	6.60 (.82)	.48 (1.02)	437.69***	1,2 > 3
Hyp-Imp. symptoms	7.48 (1.19)	1.32 (1.25)	.97 (1.35)	311.16***	1 > 2,3
ADHD scale					
Inattention-M	17.93 (5.53)	17.64 (4.89)	2.31 (2.71)	111.39***	1,2 > 3
Inattention-T	20.70 (4.78)	18.96 (5.56)	.52 (.83)	214.06***	1,2 > 3
Hyp-Imp.-M	18.66 (4.48)	9.24 (6.14)	3.86 (3.82)	88.64***	1 > 2 > 3
Hyp-Imp.-T	19.59 (6.49)	3.64 (4.53)	1.41 (1.99)	141.72***	1 > 2,3

Note: Standard deviations in parentheses. ADHD = Attention-Deficit/Hyperactivity Disorder; CT = Combined Type; IT = Inattentive type; M = Mother; T = Teacher.
***$p < .001$.

Sets of conceptually or empirically related continuous measures were analyzed first using multivariate analyses of variance (MANOVAs). Significance was determined using Wilks' Lambda. Correlations were computed between the child's age and all dependent measures. Significant correlations were evident for just three measures, these being the examiner's behavior ratings during child testing and the observed behaviors during the math task and CPT. Age was not significantly correlated with severity of ADHD and thus was not dependent on or related to the independent variable (an assumption of analysis of covariance). Age was therefore used only as a covariate in the analyses of these three dependent measures. Given the large number of tests, statistically significant MANOVA/MANCOVA analyses were followed by univariate analyses of variance (ANOVA) or covariance (ANCOVA). This procedure provided protection against an inflated Type I error rate. To further reduce the likelihood of this error, we used a more conservative alpha level for these analyses (.01). Scheffé or simple contrast analyses tests ($p < .05$) were further used to analyze potential pairwise group differences for those variables that yielded significant ANOVAs/ANCOVAs. Categorical data were analyzed with chi square tests.

Age of onset, psychiatric comorbidity, and impairment

Among children with the CT, the age of onset of hyperactivity-impulsivity symptoms ($M = 3.79$, $SD = 2.18$) was significantly earlier than the age of inattention symptoms, $M = 5.11$, $SD = 1.83$, $t(40) = 4.00$, $p < .001$, two-tailed. In addition, children with the CT had a significantly earlier age of onset of inattention symptoms than those with the IT, $M = 6.20$, $SD = 1.83$, $t(63) = 2.36$, $p = .02$, two-tailed.

The comorbidity for the clinical groups was generally low, reflecting the fact that this was not a clinic-referred sample. Significant differences among the groups were found only for ODD, χ^2 (2, $N = 98$) = 9.89, $p < .01$. About 46% of the children with the CT met criteria for this disorder, whereas 20% of the children with the IT and 14% of those in the control group received such diagnosis. None of the children presented CD or BD. The groups did not differ ($p > .05$) on their rates of anxiety (GAD and SAD) and affective (MD and DD) disorders. Finally, the CT ($M = 55.50$, $SD = 7.09$), and IT ($M = 63.44$, $SD = 6.41$) received lower CGAS scores than the control group ($M = 85.17$, $SD = 11.90$), indicative of more clinical impairment, $F(2, 95) = 104.58$, $p < .001$. The CT group was rated as significantly more impaired than the IT group ($p < .05$).

Examiner, mother and teacher ratings of child behaviors

The examiner ratings of overactivity, impulsivity, attention span, oppositional defiance and emotional reactivity during the testing sessions were obtained for 74 children and analyzed using MANCOVA with children's age as the covariate. This overall analysis was statistically significant, $F(5, 66) = 3.12$, $p < .001$. As reported in Table 2, subsequent ANCOVAs and simple contrast analyses indicated that children in the CT group were rated as more overactive, impulsive, and emotionally reactive than children in the IT. The latter did not differ from children in the control group on these measures. The CT group was also rated as presenting a shorter attention span than the IT group, who also presented a shorter attention span than the control group.

Table 2 Mean examiner, mother, and teacher ratings of child behaviors for each group

Measures	Groups			*F*	Contrasts
	ADHD-CT (1)	ADHD-IT (2)	Control (3)		
Examiner's ratings					
Overactivity	1.03 (.80)	.33 (.48)	.26 (.45)	10.08***	1 > 2,3
Impulsivity	.79 (.77)	.24 (.54)	.00 (.00)	10.54***	1 > 2,3
Short Attention span	.97 (.72)	.57 (.51)	.16 (.37)	10.44***	1 > 2 > 3
Oppositional defiant	.44 (.70)	.14 (.36)	.05 (.23)	3.96	–
Emotional reactivity	.50 (.66)	.10 (.30)	.05 (.23)	5.79**	1 > 2,3
ODD Scale					
ODD-M	11.59 (5.29)	8.00 (5.61)	3.64 (2.92)	24.14***	1 > 2 > 3
ODD-T	12.39 (6.91)	2.48 (3.27)	.55 (1.15)	59.84***	1 > 2,3
Child Behavior Checklist (CBCL)					
Externalizing – M	66.07 (8.32)	54.25 (8.36)	47.18 (8.91)	42.60***	1 > 2,3
Delinquent – M	64.77 (7.35)	59.42 (6.83)	54.64 (5.22)	20.30***	1 > 2,3
Aggressive – M	66.61 (10.47)	54.71 (6.68)	52.11 (4.32)	41.28***	1 > 2,3
Internalizing – M	62.66 (9.22)	63.50 (10.55)	53.79 (8.25)	7.42***	1,2 > 3
Withdrawn-M	62.98 (8.37)	65.46 (9.99)	56.32 (5.60)	8.78***	1,2 > 3
Somatic complaints-M	59.34 (8.09)	61.33 (9.97)	55.75 (5.96)	2.59	–
Anxious-depressed–M	60.70 (9.79)	59.38 (9.68)	54.71 (5.71)	4.23	–
HSQ No. of settings	8.49 (3.62)	6.36 (3.33)	3.81 (3.06)	15.80***	1 > 2 > 3
SSQ No. of settings	7.02 (2.85)	1.71 (2.33)	.45 (1.33)	79.74***	1 > 2,3
SSSQ-M	41.82 (7.90)	44.92 (9.77)	50.69 (6.67)	10.53***	1,2 < 3
SSSQ-T	25.05 (8.66)	27.36 (6.70)	48.31 (5.35)	96.22***	1,2 < 3
IATQ	21.44 (6.28)	20.76 (5.89)	31.22 (6.73)	24.49***	1,2 < 3
Sluggish Cognitive Tempo Scale					
SCTS-M	2.14 (2.13)	3.42 (2.57)	.21 (.50)	18.04***	2 > 1 > 3
SCTS-T	4.77 (2.88)	8.00 (2.06)	.24 (.79)	82.95***	2 > 1 > 3

Note: Standard deviations in parentheses. *T*-scores are presented for the CBCL, based on US norms. ADHD = Attention Deficit/Hyperactivity Disorder; CT = Combined Type; IT = Inattentive Type; ODD = Oppositional defiant disorder; HSQ = Home Situations Questionnaire; SSQ = School Situations Questionnaire; IATQ = It's About Time Questionnaire; SSSQ = Spanish Social Skills Questionnaire; SCTS = Sluggish cognitive tempo scale; M = Mother; T = Teacher.
**$p < .01$; ***$p < .001$.

The MANOVAs for mother ratings (raw scores) on the CBCL internalizing and externalizing scales, ODD subscale, HSQ, SSSQ, and IATQ yielded significant findings, $F(6, 88) = 10.42$, $p < .001$. Similar analyses for the CBCL narrow-band internalizing and externalizing scales yielded significant findings, $F(5, 89) = 10.67$, $p < .001$. Finally, the MANOVA for teacher ratings on the ODD subscale, SSQ, and SSSQ also yielded significant findings, $F(3, 92) = 56.61$, $p < .001$. Table 2 summarizes the means and standard deviations, subsequent ANOVAs and Scheffé analyses for these mother and teacher ratings. Means for the CBCL scales are *T*-scores.

Relative to the IT and control groups, the ADHD-CT group was rated by mothers as presenting more delinquent, aggressive, and externalizing behaviors; and by mothers and teachers as presenting more oppositional behaviors and more settings in which behavior problems occur at home and school. The IT group presented more oppositional defiant behaviors at home, and more settings in which conduct problems occurred, than the control group.

ADHD groups did not differ on mother ratings of internalizing behavior, but were rated as presenting significantly more of these behaviors than the control group. Children in the CT and IT groups presented comparable levels of withdrawn behaviors, but were more withdrawn than the control group. No significant group differences were found for the somatic complaints and anxious-depressed scales. Finally, the CT and IT groups presented more difficulties in the use of time at home than the control group, but were not significantly different from each other.

Attentional style

Although the two clinical groups presented comparable mean DSM-IV inattention scores at home and at school (Table 1), further analyses (ANOVAs and Scheffé tests) were done to examine whether they differed on the SCT inattention symptoms identified in these settings. As can be seen in Table 2, the IT group obtained significantly higher mother and teacher scores on the SCTS than the CT and control group. Logistic regression analyses were conducted to examine the extent to which scores on the mother and teacher SCTS could predict membership of the ADHD types. The cutoff value selected for predicting an observation as an event was .5. Both regression models were significant, χ^2 (1, $N = 69$) = 4.63 for the mother model and χ^2 (1, $N = 68$) = 21.30 for the teacher model, $p < .05$. A lower score on the mother (odds ratio [OR] = 1.27) or teacher (OR = 1.62) SCTS

is predictive of a higher probability of belonging to the CT group. The teacher SCTS was a stronger predictor of group membership. Scores on the mother SCTS classified correctly 71% of the cases (CT = 91%, IT = 33%), whereas scores on the teacher SCTS classified 75% of these (CT = 80%; IT = 68%).

Psychoeducational measures

Total IQ scores, Spanish reading and math scores on the WPB-S, and the BGT scores were analyzed using a MANOVA, $F(4,92) = 5.68$, $p < .001$. As can be seen in Table 3, the groups differed significantly on IQ, but the scores were within the normal range. Only the IT group obtained lower scores than the comparison group. The two clinical groups also obtained significantly lower reading and math scores. No significant differences were found on BGT scores. Participants that were 8 years or older ($n = 61$) were also administered the Spelling subtest of the TRWL. The two clinical groups obtained significantly lower scores than the control group (Table 3).

Social skills ratings

As pointed out, the CT and IT groups did not differ on the total scores on the SSSQ at home and school, but obtained significantly lower scores than the comparison group (Table 2). In order to examine if the ADHD groups presented different profiles on these questionnaires, mother and teacher ratings were also analyzed using a MANOVA. The latter yielded significant findings, $F(8, 88) = 16.87$, $p < .001$. Of particular interest (see Table 4) were the findings that at home children in the CT group received significantly higher scores than those in the IT and control groups on the Social Initiative Scale (SIS) and lower scores on the Self-Control Scale (SCS). Of further interest are the findings that the two ADHD groups presented a similar profile at school. Children in the IT group obtained lower scores on the Assertion Scale (AS) than children in the CT group. The latter, on the other hand, obtained lower scores than the IT group on the SCS.

Logistic regression analyses were conducted to evaluate to what extent the SIS and SCS completed by mothers, and the AS and SCS completed by teachers, respectively, could discriminate between the ADHD types. The cutoff value selected for predicting an observation as an event was .5. The logistic regression models were highly significant, χ^2 $(2, N = 69) = 27.19$ for the mother model and χ^2 $(2, N = 68) = 26.99$ for the teacher model, $p < .001$. A higher score on the mother-completed SIS is

Table 3 Mean reading, math, bender gestalt and spelling scores for each group

	Groups				
Measures	ADHD-CT (1)	ADHD-IT (2)	Control (3)	*F*	Contrasts
Total IQ	101.59 (11.46)	96.56 (9.61)	107.59 (10.80)	7.05**	2 < 3
WPB-S Reading	95.91 (11.92)	93.96 (13.08)	109.55 (8.65)	16.46***	1,2 < 3
WPB-S Math	89.20 (11.16)	84.28 (11.61)	102.00 (9.97)	19.73***	1,2 < 3
BGT	90.41 (18.35)	91.68 (20.23)	101.31 (16.00)	3.40	
TRWL-Spelling	87.75 (9.39)	87.86 (10.07)	104.25 (8.78)	20.41***	1,2 < 3

Note: Standard deviations in parentheses. ADHD = Attention-Deficit/Hyperactivity Disorder; CT = Combined type; IT = Inattentive Type; WPB-S = Woodcock Psychoeducational Battery-Spanish. BGT = Bender Gestalt Test; TRWL = Test of Reading and Written Language.
**$p < .01$; ***$p < .001$.

Table 4 Social skills mother and teacher ratings for each group

	Groups				
Measures	ADHD-CT (1)	ADHD-IT (2)	Control (3)	*F*	Contrasts
SSSQ – Mother					
Social initiative	10.41 (2.33)	8.72 (2.92)	8.93 (2.40)	4.82**	1 > 2,3
Self-control	4.75 (1.46)	6.52 (1.85)	6.41 (1.90)	12.29***	1 < 2, 3
Cooperation	7.68 (2.79)	8.56 (4.14)	11.62 (3.55)	12.11***	1, 2 < 3
Social judgment	11.93 (3.60)	13.36 (2.50)	15.45 (2.64)	11.39***	1,2 < 3
Social sensibility	8.41 (1.90)	9.32 (1.65)	9.86 (1.62)	6.31**	1 < 3
SSSQ – Teacher					
Cooperation	7.02 (3.58)	7.96 (3.31)	18.59 (1.88)	134.50***	1,2 < 3
Assertion	9.58 (3.30)	7.44 (3.11)	13.52 (3.04)	26.03***	2 < 1 < 3
Self-control	8.44 (3.76)	11.96 (3.51)	16.21 (2.35)	47.13***	1 < 2 < 3

Note: Standard deviations in parentheses. ADHD = Attention-Deficit/Hyperactivity Disorder; CT = Combined type; IT = Inattentive type. SSSQ = Spanish Social Skills Questionnaire.
**$p < .01$; ***$p < .001$.

predictive of a higher probability of belonging to the CT group (OR = 1.45), whereas a high score on the SCS is associated with a lower probability of belonging to this group (OR = 2.25). Scores on these two scales classified correctly 81% of the cases (CT = 86%, IT = 72%). For the teacher ratings, on the other hand, a higher score on the AS is predictive of a higher probability of belonging to the CT group (OR = 1.43) whereas a high score on the SCS is associated with a lower probability of belonging to this group (OR = 1.46). Scores on these scales classified correctly 78% of the cases (CT = 88%, IT = 60%).

Behavioral observations and laboratory tests

The set of behavioral observations during the math task and CPT were analyzed using a MANCOVA with child's age serving as the covariate. These measures were transformed logarithmically to reduce variability. Table 5 presents the non-transformed means and standard deviations. The MANCOVA yielded statistically significant differences, $F(10, 83) = 2.61$, $p < .001$. Subsequent ANCOVAs and contrast analyses indicated that relative to the control group, the ADHD groups displayed more playing with objects and out-of-seat behaviors during the math task. The CT group also played significantly more with objects during the CPT than did the control group. Separate ANCOVAs indicated that the three groups differed significantly on total ADHD behaviors during the CPT. The clinical groups displayed significantly more ADHD behaviors.

The scores used for the CPT (total number of omissions, total commissions, and mean reaction time) were analyzed using MANOVA. No significant overall group differences were found, $F(3, 88) = .64$, $p = .70$. The actigraph measures of activity level during the math task and CPT were also analyzed using MANOVA. This analysis also failed to yield significant findings, $F(2, 77) = .42$, $p = .80$.

Mother self-report measures

The mother self-report scales were analyzed using a MANOVA, which was significant, $F(6, 88) = 9.74$, $p < .001$. As can be seen in Table 6, the ANOVAs did not yield significant between-group differences on self-reports of depression (BDI), satisfaction with family relationships (Family APGAR), and inattention and hyperactivity-impulsivity symptoms during childhood and during the last 6 months (ADHD SS-SRF). As reported by mothers, the stressful family experiences associated with rearing children (FEI) with the CT were significantly greater than those of mothers of children with the IT, who in turn had significantly greater stressful experiences than those in the control group. In addition, the mothers of children in the ADHD groups did not report significantly different parenting practices, but did report poorer practices than those reported by mothers in the control group.

Discussion

Our findings support the construct validity of ADHD in a Hispanic/Latino sample from Puerto Rico, a much understudied population in clinical child psychology. Those with ADHD presented a profile of adaptive, behavioral, social, and academic difficulties as assessed by different methods in multiple settings (school, home, laboratory) and from multiple sources (teachers, parents, and children). These children were rated by clinicians as impaired in their global adaptive functioning, with a measure that has been empirically validated with Puerto Rican children (Bird et al., 1987). Findings from the present

Table 5 Behavioral observations during the math task and the Continuous Performance Test for each group

	Groups				
Measures	ADHD-CT (1)	ADHD-IT (2)	Control (3)	*F*	Contrasts
Math Task					
Off-task	57.38 (25.50)	65.99 (25.73)	48.14 (22.51)	2.47	–
Fidgeting	21.02 (18.88)	32.35 (31.95)	24.71 (26.70)	.59	–
Vocalizing	64.36 (34.76)	45.82 (38.18)	39.13 (37.93)	3.96	–
Play with objects	19.88 (25.61)	14.35 (26.69)	3.52 (10.01)	6.63**	1,2 > 3
Out of seat	19.93 (24.44)	15.98 (23.70)	3.97 (9.98)	7.77***	1,2 > 3
Total behaviors	34.07 (16.19)	30.23 (14.31)	23.41 (12.87)	3.23	–
CPT					
Off-task	76.86 (19.80)	72.08 (22.65)	57.76 (18.97)	4.15	–
Fidgeting	21.35 (24.85)	18.31 (18.16)	20.88 (16.26)	.30	–
Vocalizing	35.60 (33.38)	30.07 (27.64)	12.70 (14.89)	4.52	–
Play with objects	38.17 (27.48)	19.97 (16.08)	17.25 (20.00)	6.80**	1 > 3
Out of seat	25.41 (28.66)	18.60 (18.50)	6.15 (5.72)	3.93	–
Total behaviors	36.56 (16.30)	31.37 (13.87)	22.87 (9.31)	6.43**	1,2 > 3

Note: Standard deviations in parentheses. ADHD = Attention-Deficit/Hyperactivity Disorder CT = Combined type; IT = Inattentive type. CPT = Continuous Performance Test.
**$p < .01$; ***$p < .001$.

Table 6 Mother self-report measures for each group

Measures	Groups			F	Contrasts
	ADHD-CT (1)	ADHD-IT (2)	Control (3)		
BDI	10.30 (11.53)	9.24 (9.15)	9.48 (9.26)	.10	–
FEI	47.86 (18.24)	29.76 (11.13)	14.28 (8.66)	49.36***	1 > 2 > 3
Family APGAR	8.25 (2.87)	7.08 (2.81)	7.17 (2.48)	2.00	–
ADHD Current	8.84 (8.90)	5.96 (3.90)	4.03 (4.35)	4.65	–
ADHD Past	8.36 (7.50)	6.48 (6.61)	5.46 (6.56)	1.58	–
PPI	79.20 (11.67)	78.36 (8.72)	89.66 (9.04)	11.31***	1,2 < 3

Note: Standard deviation in parentheses. ADHD = Attention-Deficit/Hyperactivity Disorder; CT = Combined type; ADHD-IT = Inattentive type. BDI = Beck Depression Inventory; FEI = Family Experience Inventory; ADHD = ADHD Rating Scale; PPI = Parent Practices Inventory.
**$p < .01$; ***$p < .001$.

study are similar to the ones reported in the extensive Anglo research literature (Barkley, 1998).

The present findings do not support the concept that the IT is more prevalent in the population but less likely to be referred for treatment (Carlson & Mann, 2000). Of those children ($n = 44$) classified as inattentive by teacher ratings, only about half (57%) were diagnosed as ADHD-IT. In contrast, 83% of the children classified as inattentive-hyperactive were diagnosed as ADHD-CT. This finding suggests that a considerable number of children who are classified as ADHD-IT based on teacher ratings can be false positive cases when a DSM-IV diagnosis is obtained by direct clinical interview.

The two ADHD types did not differ on the indices of socioeconomic status analyzed in this study, which is contrary to the findings reported in previous clinical reports (Eiraldi et al., 1997; Faraone et al., 1998). Ages of onset of inattention and hyperactivity-impulsivity symptoms were examined separately. Children in the CT group presented an earlier age of onset of inattention symptoms than the IT group. As predicted, for those in the CT group the onset of the hyperactivity-impulsivity symptoms was 1.32 years earlier than the inattention symptoms. These findings support our hypothesis in a school-based sample and are consistent with previous clinical studies (e.g., Faraone et al.) that indicate that the CT is associated with an earlier onset. In addition, the results suggest that the hyperactivity-impulsivity symptoms precede the emergence of inattention symptoms. Further research is needed in this area given parents' difficulties in recalling this information accurately, the possibility that inattention symptoms appear simultaneously with hyperactivity-impulsivity but are identified later as demands for sustained attention increase over development, and the theoretical significance of those findings for understanding the neurological mechanisms that are implicated in the etiology of the CT and IT of ADHD.

As compared to the CT, the IT group presented lower rates of comorbid ODD and fewer externalizing behavior problems. These findings confirm our hypothesis and are consistent with previous results (Lahey & Willcutt, 2002). As hypothesized, the two groups did not differ on their levels of internalizing problems. Interestingly, in none of the analyses for the narrow-band internalizing scales did the CT group obtain significantly higher scores than the IT group. These findings are consistent with what has been reported in clinic-referred samples (Eiraldi et al., 1997; Faraone et al., 1998).

Contrary to our hypothesis, the IT group did not differ from the CT group on global ratings of social skills at home and school. However, their profile was different. Children in the IT group tend to show less social initiative or assertiveness and to be more self-controlled in their social interactions. These children are at risk for being neglected or overlooked due to their shyness or passivity. Children in the CT group, on the other hand, are more likely to initiate social interactions or to be more assertive than the IT group, but are prone to emotional reactivity and lack the self-control necessary to sustain adequate social interactions. Consequently, they are at risk for being rejected due to their difficulties in self-regulation. It is important to note, however, that what we have conceptualized as a greater social initiative disposition in children in the CT group could reflect a misinterpretation on the part of the mothers of some of the items that compose this scale (e.g., 'introduces herself or himself without being told to'). Mothers may have interpreted this type of item not as a social skill but as another instance of the hyperactive-impulsive behaviors of their children. Thus, further research is needed to replicate our findings with other samples and social initiative measures. Apart from the above, the neglected or overlooked hypothesized risk factors are consistent with the findings reported by Hodgens, Cole, and Boldizar (2000) who found that clinic-referred children in the IT group were more likely to be nominated by peers as very shy and to display social withdrawal in play groups at school. This was in contrast to the children with the CT who were more likely to be nominated for starting fights and arguments. Overall, our findings suggest that disinhibition and inadequate self-regulation are the underlying processes accounting for the poorer social skills of the CT, in contrast with the

passivity and withdrawal behaviors that appear to account for the skills of the IT.

Only children in the IT group obtained significantly lower total intelligence scores than comparison children. Consistent with our hypothesis and findings from clinic-based studies (e.g., Faraone et al., 1998), the IT and CT groups presented comparable psychoeducational scores, but lower reading and math scores, than the control group. The academic findings of the present study are of significance since they cannot be attributed to treatment referral bias and indicate that both subtypes of ADHD are at substantial risk for educational underachievement.

The CT and IT groups presented more total ADHD type behaviors than the control group during the CPT task but did not display different behavior patterns. Similar to Barkley et al.'s (1990) study, significant group differences were not found on the actigraph measures during the math task and CPT. The groups did not differ on the scores obtained for the CPT either. However, an examiner was not present during the administration of the CPT, as implied in the test manual (Conners, 1995). Thus, it is not known whether different findings would be obtained had an examiner accompanied the children during the task, since his/her presence can affect performance on the CPT (Power, 1992). At any rate, the findings are consistent with the view that the children's behavior during a computerized test can be indicative of ADHD diagnostic status (ADHD vs. control) but are of little or no utility in distinguishing between these two ADHD subtypes.

Although the two clinical groups presented similar DSM-IV inattention mean scores at home and at school, the IT obtained significantly higher scores on the SCT scales constructed for both settings. These findings confirm our hypothesis and suggest that children in the IT and CT groups display qualitatively different inattention symptoms, as has been previously reported in clinical and school-based samples (Carlson & Mann, 2002; McBurnett et al., 2001). Specifically, the IT presents more of an inattention style characterized by sluggishness, underactivity, confusion, daydreaming, and staring, as reported by mothers and teachers. The main difficulty of IT children appears to be focusing attention and regulating alertness (Barkley, 1998; McBurnett et al., 2001). It is possible that their attention drifts when sustained listening is required and get excessively preoccupied with their own thoughts. Consequently, the hypothesized difficulty in regulating alertness can result in DSM-IV inattention symptoms such as not listening, not following through on instructions, losing things, and forgetfulness that are secondary to their SCT attentional difficulties. Further work is needed to identify a more refined and extensive pool of SCT symptoms that can be used to study the construct validity of an attentional disorder characterized by sluggish cognitive tempo and information processing difficulties.

Interestingly, our data indicate that children with the IT are not necessarily hypoactive or underactive at home. It could be that their hypothesized drowsiness and insufficient regulation of alertness are readily observable mostly in situations where the child has to engage in subdued activities or complex cognitive tasks such as in school or while doing homework. In addition, mothers reported that the IT and control group did not differ on ratings of delinquent and aggressive behaviors but that these inattentive children presented more settings in which behavior problems occur at home and were more oppositional-defiant. This pattern of findings suggests that children in the IT group can present behavioral difficulties associated with their inattentiveness at home and passive noncompliance with requests (e.g., when getting dressed, doing homework, etc.) that could be interpreted by mothers as oppositional-defiant behavior.

Consistent with our hypothesis, mothers in the IT group reported significant stressful family experiences associated with child rearing. These experiences were less intense than those reported by mothers in the CT group. Our results are to be expected given the impairing quality of ADHD symptoms, the behavior problems these children display at home (particularly those with the CT), their social interaction difficulties and poorer academic performance. Analyses of the mothers' reports suggest that the IT and CT are differentially associated with dimensions of child-related family stress. Whereas the CT appears to affect mother–child, mother–teacher, and child–sibling relationships, family finances, and family social life, the IT appears to affect only mother–child and mother–teacher relationships. If confirmed in further analyses of these data, the findings could support the view that these types have a disorder-specific impact on family life and the need to distinguish them as separate disorders.

As previously reported by Barkley et al. (1990), maternal depression and reduced satisfaction with family relationships were not differentially associated with the clinical groups. Mothers of children with the CT and IT reported poorer parenting practices as compared to the control group. These findings probably reflect bidirectional processes in which the child's behavior and attentional difficulties elicit poor parenting practices which in turn negatively affect children's behavior. Overall, our results imply that treatment programs that include training in parenting practices and in stress management, components originally designed for children with the CT, can also be of benefit to those with the IT.

Previous investigators have often used various subject selection or statistical procedures to control for the overlap of ODD and its symptoms with ADHD.

This is done to remove the influence that the latter co-existing disorder may have on the results, as if this overlap were a confounding influence on the results obscuring the effects of ADHD on the dependent measures. Research, however, suggests that these two disorders are highly inter-correlated and may be inherently related to each other (Hinshaw, 1987), with ADHD predisposing toward and possibly giving rise to ODD (Burns & Walsh, 2002). Thus, the presence of ODD in ADHD samples is not an artifact of biased recruiting nor a confounding influence. Its strong relationship to ADHD means that it cannot be used as a covariate in analyses of dependent measures in our study as doing so would remove variance in the dependent measures directly due to ADHD. Such use of ODD as a covariate would also violate assumptions of that analysis (independence of the covariate from the independent variable) (Miller & Chapman, 2001).

For children in the IT group, teacher ratings on the DM and AI scales of the SBI were at least one standard deviation apart. In addition, all of these children presented 4 or fewer clinically assessed hyperactivity-impulsivity symptoms. These data indicate that probably most children in the IT group were not subthreshold cases of the CT. However, McBurnett et al. (2001) have hypothesized that there may be two different groups of non-hyperactive inattentive children: the first defined by DSM-IV inattention symptoms and the second by SCT symptoms. Since in our study not all of the children in the IT group presented high levels of SCT, it is possible that the IT group was not a homogenous one. This hypothesis is consistent with findings that scores on the SCTS classified correctly a lower proportion of children in the IT group, as compared to those in the CT group. Future research should identify children on the basis of SCT criteria. It is plausible that such a group presents particular etiologies and patterns of associated conditions including a higher comorbidity with internalizing disorders (Milich et al., 2001).

It is important to keep in mind that although participants were not recruited from treatment facilities to reduce referral bias, the screening procedures used in this study may have resulted in some sample selection biases. Also, we excluded children with psychotropic medication prior to 6 months of study participation since we wanted to identify the potential ADHD types based on teacher ratings. This methodological decision may have resulted in the exclusion of severely impaired children. This is not likely to be the case since the prevalence of medication treatment for Puerto Rican children with ADHD in the community ranges from 3.6% to 7.2% (Bauermeister et al., 2003). At any rate, it is important to note that the sample characteristics do not necessarily resemble those of a sample randomly selected from the population. Another potential limitation is the small size of the IT group, which reduced the power of the analyses to detect potential group differences on some of the measures. Finally, although our design has a particular strength in that children in the control group were also nominated by teachers and recruited from school settings, the former may have identified highly self-disciplined students. Thus, it is possible that our participants in the comparison group were not necessarily typical non-ADHD students, although six of them received other DSM-IV diagnoses.

With these limitations in mind, it is important to note that, in this Hispanic/Latino sample, the IT group has a later onset of inattention symptoms, is characterized by an SCT attentional style, is less prone to action and more self-controlled in social interactions, is less likely to have comorbid disruptive disorders and externalizing behavior problems, is associated with less child-related family stress, and is less impaired in their adaptive functioning. In contrast, the CT group has an earlier onset of hyperactivity-impulsivity and inattention symptoms, is characterized by a pattern of behavioral disinhibition and poor self-regulation, shows more social initiative but less self-control in social interactions, is more likely to have comorbid disruptive and externalizing behavior problems, has mothers who reported more child-related family stress, and is more globally impaired. The discrepant profile of inattention symptoms, social interaction styles, and pattern of externalizing behaviors of these two clinical groups appear to represent distinct disorders. Further research is needed to confirm this conclusion.

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