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# Attention deficit hyperactivity disorder and its relation to social skills and leadership evaluated with an evaluation system of the behavior of children and adolescents (BASC)

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**Introduction.** Numerous studies have documented that children with attention deficit hyperactivity disorder (ADHD) show a low social competence.

**Objective.** To compare the symptomatic severity of ADHD, as well as associations to different subtypes, sex and comorbidities, with social functioning ("ability" and "leadership") estimated through a Behavior Assessment System for Children (BASC) for parents and teachers.

**Patients and methods.** We have retrospectively analyzed 170 patients with ADHD, diagnosed between 2007 and 2010. Social "ability," "leadership," "hyperactivity" and "attention-deficit" sections of BASC and cardinal symptoms of ADHD measured through a Spanish scale for de evaluation of DHD (E-DHD) were registered. Results of these variables are analyzed according to the normative data by age and sex, and processed in Z values.

**Results.** The ratings for social skills were significantly lower in patients with conduct disorder or oppositional defiant disorder as informed by parents ( $p < 0.05$ ). Symptomatic intensity of ADHD showed significant ( $p < 0,001$ ) and inverse relation with social "ability" as parents. "Attention-deficit" scores were related with social "ability" and "leadership" as parents and teachers.

**Conclusions.** Intensity of attention deficit was the only variable that showed a significant relation with the social skills and leadership according to the BASC scores, independently of the informer.

Key words:  
BASC, EDAH, Social skills, Leadership, ADHD, Attention deficit/hiperactivity disorder

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## Trastorno por déficit de atención/ hiperactividad y su relación con las habilidades sociales y de liderazgo evaluadas a través de un sistema de evaluación de la conducta de niños y adolescentes (BASC)

**Introducción.** Numerosos estudios han documentado que los niños con trastorno por déficit de atención/hiperactividad (TDAH) experimentan una baja competencia social.

**Objetivo.** Comparar la intensidad sintomática del TDAH, así como la asociación de los diferentes subtipos, sexo y comorbilidades con el funcionamiento social ("habilidad social" y "liderazgo") estimado a través de un sistema de evaluación de la conducta de niños y adolescentes para padres y profesores (BASC).

**Pacientes y métodos.** Se analizan retrospectivamente 170 pacientes evaluados con diagnóstico de TDAH entre 2007 y 2010. Se analizan y comparan, entre otros, los datos de habilidades sociales, liderazgo, hiperactividad y déficit de atención del BASC y los síntomas cardinales del TDAH de la escala para la evaluación del déficit de atención con hiperactividad (EDAH). Los resultados de estas variables son analizados acorde a los datos normativos por edad y sexo, y transformados en valores Z.

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**Resultados.** Las puntuaciones correspondientes a habilidades sociales fueron significativamente menores en los pacientes con trastorno disocial o negativista según progenitores ( $p < 0,05$ ). En el análisis de la intensidad sintomática del TDAH se observó una relación inversamente significativa ( $p < 0,001$ ) entre la intensidad de la hiperactividad y las habilidades sociales según los padres. La puntuación de déficit de atención se correlacionó de igual forma con las habilidades sociales y liderazgo según padres y profesores.

**Conclusiones.** La intensidad del déficit de atención fue la única variable que, con independencia del informador, se relacionó de forma significativa con las habilidades sociales y el liderazgo según el BASC.

**Palabras clave:**

Basc, Edah, Habilidades sociales, Liderazgo, Tdah, Trastorno por déficit de atención/hiperactividad

## INTRODUCTION

Many studies have documented the fact that children with ADHD have interpersonal problems and low social competence,<sup>1-3</sup> both in the home and within the home, especially with the mother figure,<sup>1</sup> as well as in the school setting, with classmates and professors.<sup>2,3</sup> However, none of the clinical criteria included in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders, in its revised text (DSM-IV-TR)<sup>1</sup>, on the Attention Deficit Hyperactivity Disorder (ADHD) directly mentioned the emotional and/or social development of the individual.<sup>1,3</sup>

On the other hand, what will lead us to the plurisymptomatic typing of ADHD as a true disorder is its repercussion in the social sphere or academic-work sphere. Evaluating or measuring what should be understood as social or academic repercussion is one of the most complex sections in the diagnosis of ADHD per se. Separating these concepts from the concept "quality of life" or "self-esteem" is probably erroneous once again.

The social behaviors of these children as the learning of social skills are complex. The clinical expression in this section is going to be conditioned by the cognitive potential, social skills, education styles, and by the intensity of the ADHD or the presence of associated comorbid disorders.<sup>2</sup> In general, from 50 to 70% of the children who come to the consultation have social adaptation problems. The social problems of these children have frequently been linked to their self-control problems. However, the attention problems have been associated to lower social participation or interaction. In the first group, we may find more aggressive,

disruptive, noisy, bothersome, etc. children.<sup>3</sup> In the second group, timid, isolated, withdrawn, etc. children are found. These problems may appear more intensely when there are comorbid disorders. The presence of oppositional defiant disorder (ODD) is frequently associated with greater social aggressiveness and worse tolerance to frustration. The presence of communication or the coordination development disorders could condition or intensify the tendency to withdrawal and a worse prognosis in general.

## OBJECTIVE

The principal objective of this study is to compare the symptomatic intensity of ADHD and the association of the different subtypes, gender and different comorbidities (mood state disorder, anxiety disorder, oppositional defiant disorder (ODD) and antisocial disorder) with the behaviors of social skill and leadership evaluated using the Behavior Assessment System for Children (BASC) for parents and teachers (BASC system).<sup>4</sup>

## PATIENTS AND METHODS

A total of 621 evaluations made from January 2007 to December 2010 in the CADE center, motivated or justified by the suspicion of an ADHD, were analyzed retrospectively. Only those cases with ages from 6 to 12 years, both included, in which the clinical diagnosis of ADHD was finally made in accordance with the DSM-IV-TR, were analyzed. In the same way, the criteria of this manual were used for the diagnosis of the comorbid disorders analyzed in this study.

The clinical diagnosis of ADHD and the different comorbidities were performed by an experienced neurologist and child psychiatrist from our department with the same structured clinical interview before the patients were included in this review. In every case, the diagnoses were consensued retrospectively by both professionals before their inclusion and analysis.

The cases that had the following were excluded before their analysis:

- 1) significant motor or perceptual disorders;
- 2) defined mental retardation (intelligence quotient under 70);
- 3) diagnosis of generalized development disorder, obsessive-compulsive disorder, bipolar disorder, schizophrenia and/or psychosis;
- 4) known neurological diseases, epilepsy, drug abuse or addiction;
- 5) patients previously diagnosed or treated, psychologically or pharmacologically, due to suspicion of ADHD;

6) patients evaluated neuropsychologically in other departments in the last year before their evaluation.

The following parameters were recorded: age, gender and ADHD subtype. Furthermore, the presence of any type of comorbidity was evaluated. The following variables were used in this work for the statistical analysis: oppositional defiant disorder (ODD), antisocial personality disorder (ASPD), generalized anxiety disorder (GAD) and single or recurrent major depressive disorder or dysthymic disorder that we include in a single group (SAD).

As a part of the evaluation of children with ADHD in this center and protocolized, the BASC "Behavior Assessment System for Children and Adolescents"<sup>4</sup> and the ADHD, "scale for the evaluation of attention deficit hyperactivity"<sup>5</sup> were performed.

The BASC is an evaluation system of the behavior of children and adolescents based on a structured history of development and descriptive questionnaires that are filled out by the patient, parents and professors, that measure different features of the behavior and personality. This tool has been recently validated for the Spanish population.<sup>4</sup> It evaluates clinical (aggressiveness, withdrawal, hyperactivity, inattentive and others) and adaptive (adaptability, social skills and leadership) dimensions. In this tool, the social skills are defined by the expertise need to interact satisfactorily with peers and adults in the settings of the home, school and community. This is evaluated by questions such as: "does the child help other children?," "does the child congratulate others when something goes well for them?," "Does the child make suggestions without offending the others?," etc. Leadership would be included in the skill associated to achieving goals, especially social or community, specifically including the capacity to work well in group. The questions to sound out this skill are "does the child participate in social clubs or organizations?," "Is the child generally considered a the leader?," "Does the child make decisions easily?," "Does the child make good proposals for problem solving?," among others. Given the age, the BASC level II was used (corresponding to 6 to 12 year old children). This was made up of 134 questions in the version for the parents and 99 questions in the version for the teachers. Each item was scored from "A to D" (corresponding numerically to "0 to 3") where "A" corresponded to "it never occurs," and "D" to "it almost always occurs." Higher global scores on the hyperactivity scale or attention problems are related with greater symptomatic intensity in these sections. Global scores on the social skills scale or leadership are related with a lower adaptive ability of the child in these aspects. It has an elevated reliability (internal consistency, test-retest reliability, inter-evaluator agreement) and internal validity.<sup>4</sup> The Spanish version has a high grade of consistency in the correlations of each one of the elements in the different

levels and sources of information (parent or teacher). This indicates the adequacy of the common structure and supports the interpretation that can be made between different sources of information and in different age groups.<sup>4</sup>

The evaluation of the deficit/hyperactivity deficit (E-DHD) is a brief Spanish adaptation of the Conner's scale (version for professors), translated to Spanish.<sup>5</sup> It quantifies three symptomatic sections - inattentive, hyperactivity-impulsiveness and behavior problems, based on a 20-question questionnaire, and quantified with a score of 0 to 3 for each question where "0" corresponds to absence of said symptom or problem ("completely false/never") and "3" to the marked or frequent presence of it ("very true/with great frequency"). Elevated scores in any of the subscales or in the total score are correlated with greater symptomatic intensity.

The results of these variables (initially provided in typified or percentile scale scores) were then analyzed in accordance with the standard data by age and gender and transformed into Z values (according to the standard data of the test) for their subsequent analysis.

After gathering the results, these were analyzed statistically using the SPSS v17.0 for Windows program (SPSS, Chicago). Given the size and distribution of the population studied, the relation between qualitative variables (for example, gender, ADHD subtype or presence of comorbidity) with the changes observed in the Z scores of the behavioral and attention tests was evaluated by factorial analysis of the variance, with the Bonferroni *post-hoc* test when necessary. As correlation measurement, the Pearson coefficient was used. A regression study was conducted after, only if necessary.

## RESULTS

Out of the 621 evaluations analyzed, 170 fulfilled the inclusion criteria indicated in the previous section. The demographic features are described in table 1.

Distribution by gender and ADHD subtype was the following:

- Girls: 22 (54%) combined subtype, 19 (46%) predominantly inattentive type
- Boys: 72 (56%) combined subtype, 55 (42%) predominantly inattentive type, 2 (2%) predominance of hyperactive-impulsive. Given the same sample size in the last subgroup, statistically significant differences could not be obtained in comparison with the rest of the subgroups and the BASC results so that these do not

Table 1	Demographic features of the patients studied		
Mean age	- 8.4 years (SD 2.02)		
Gender	- Males: 129 (75.9%) - Females: 41 (24.1%)		
ADHD subtype (according to DSM-IV-TR criteria)	- Combined: 94 (55.3%) - Predominantly inattentive: 74 (43.5%) - Predominantly hyperactive-impulsive: 2 (1.2%)		
Cognitive capacities (WISC-IV)	- Total intelligence quotient: 103 (SD 16.7) - Verbal understanding: 107 (SD 17.7) - Perceptive reasoning: 104 (SD 16.5) - Working memory: 94 (SD 14.4) - Processing rate: 95 (SD 15.4)		
Comorbid disorders:	Patients	%	
- Oppositional Defiant	40	23.5	
- Anxiety	18	10.5	
- Mood	30	17.6	
- Anti-social	27	15.8	
SD = Standard deviation; ADHD = Attention Deficit Hyperactivity Disorder; DSM-IV-TR = fourth edition of the Diagnostic and Statistical Manual of Mental Disorders, revised; WISC-IV= Wechsler Intelligence Scale for Children - IV			

appear in the figures, although the Z values are provided.

The distribution of the subtypes according to gender did not show statistically significant differences (p=0.68).

The intensity of the hyperactivity quantified through the BASC and E-DHD, according to mother and professor, was higher in males than in females, but without statistically significance (Z=0.89 vs Z=0.28, respectively), except in the case of the Z value in the hyperactivity section corresponding to the BASC filled out by the father, which was significantly greater in males than in females (p=0.017). The values observed in this section in the mentioned scales were statistically greater in the combined subtype than in the predominantly inattentive subtype (p<0.05), regardless of the informer.

The Z values corresponding to the inattentive type section on these same scales were higher in females, although without statistical significance. The intensity of the attention problems measured with the tests indicated did not show a significant difference between the different ADHD subtypes, regardless of the evaluator.

In the analysis of the "social skills" section corresponding to the BASC filled out by the mother, father, teacher, and related to gender and subtype, the following was observed:

- Boys obtained lower scores than girls according to the mothers (Z=-0.58 vs Z=-0.28, p=0.13) and fathers (Z=-0.65 vs Z=-0.22, p=0.06), but without statistical significance and the girls obtained practically identical scores as the boys according to the professors (Z=-0.61 vs Z=-0.63, p=0.72).
- The relation to the ADHD subtype, the scores obtained in the section indicated were lower in patients with ADHD having hyperactive-impulsive predominance, followed by combined ADHD, and higher in the cases of ADHD with predominantly inattentive type. A significant difference was only observed between the last two subtypes, when the registry was filled out by the father (p<0.01).

In the study of the field "leadership" itself of the BASC filled out by the mother, father and teacher, and relation to gender and subtype, the following was observed:

- Boys obtained higher Z scores than girls according to the mothers (Z=-0.36 vs Z=-0.41, p=0.77), fathers (Z=-0.18 vs Z=-0.30, p=0.55) and professors (Z=-0.67 vs Z=-0.78, p=0.57), but in a non-statistically significant way.
- In relation to the ADHD subtype, the scores obtained in the section were lower in patients with combined ADHD than in the cases of ADHD having predominantly inattentive type according to both parents and similar according to the teacher. It did not reach statistical

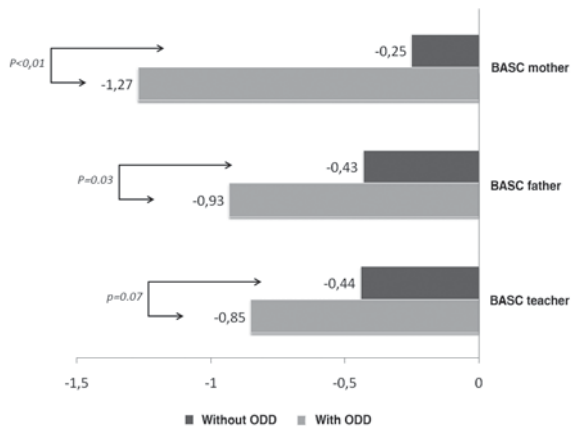


Figure 1

Relation between the mean scores (transformed into Z values) of the BASC filled out by the mother, father and teacher in the section "social skills" and the presence of comorbid or non-comorbid ADHD with oppositional defiant disorder (ODD) with said disorder

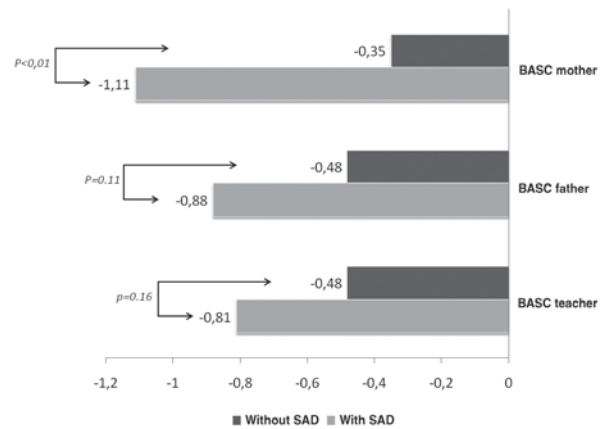


Figure 2

Relation between the mean scores (transformed into Z values) of the BASC filled out by the mother, father and teacher in the section "social skills" and the presence of comorbid or non-comorbid ADHD with mood state disorder (SAD) with said disorder

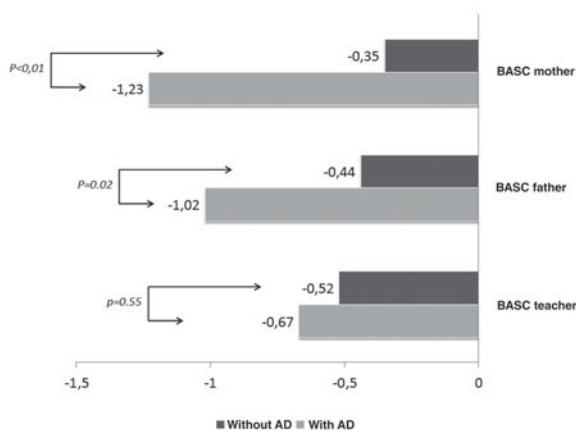


Figure 3

Relation between the mean scores (transformed into Z values) of the BASC filled out by the mother, father and teacher in the "social skills" section and the presence of comorbid or non-comorbid ADHD with antisocial disorder (AD) with said disorder

comorbidity of ADHD, the following could be confirmed:

- ODD: The Z scores corresponding to "social skills" were significantly lower in patients with ODD according to both parents ( $p < 0.05$ ), and close to said significance according to the teacher ( $p = 0.07$ ) (figure 1). This relation was observed regardless of gender and subtype of ADHD. No significant difference appeared in its relation to the Z scores of "leadership".
- GAD: No significant differences were observed among patients with or without GAD, in either the section "social skills" or in "leadership".
- SAD: The Z scores corresponding to "social skills" and "leadership" were lower in patients with SAD according to both parents and teacher, although statistical significance was only observed between the "social skills" section of the BASC filled out by the mother ( $p < 0.01$ ) (Figure 2). Using the factorial analysis, it was confirmed that this relation was only significant in males ( $p < 0.01$ ).
- AD: The Z scores corresponding to "social skills" were significantly lower in patients with antisocial disorder (AD) according to both parents ( $p < 0.05$ ) but not according to the teacher ( $p = 0.55$ ), where there was only a minimum non-significant tendency to said correlation (figure 3). This relation was observed independently of gender and ADHD subtype. No significant relation was observed in its relation to the Z scores of "leadership".

significance in the analysis between subtypes and scores in the section "leadership" of the BASC, regardless of the informer.

In the evaluation of the "social skills" and "leadership" sections quantified in the BASC, and their relation to

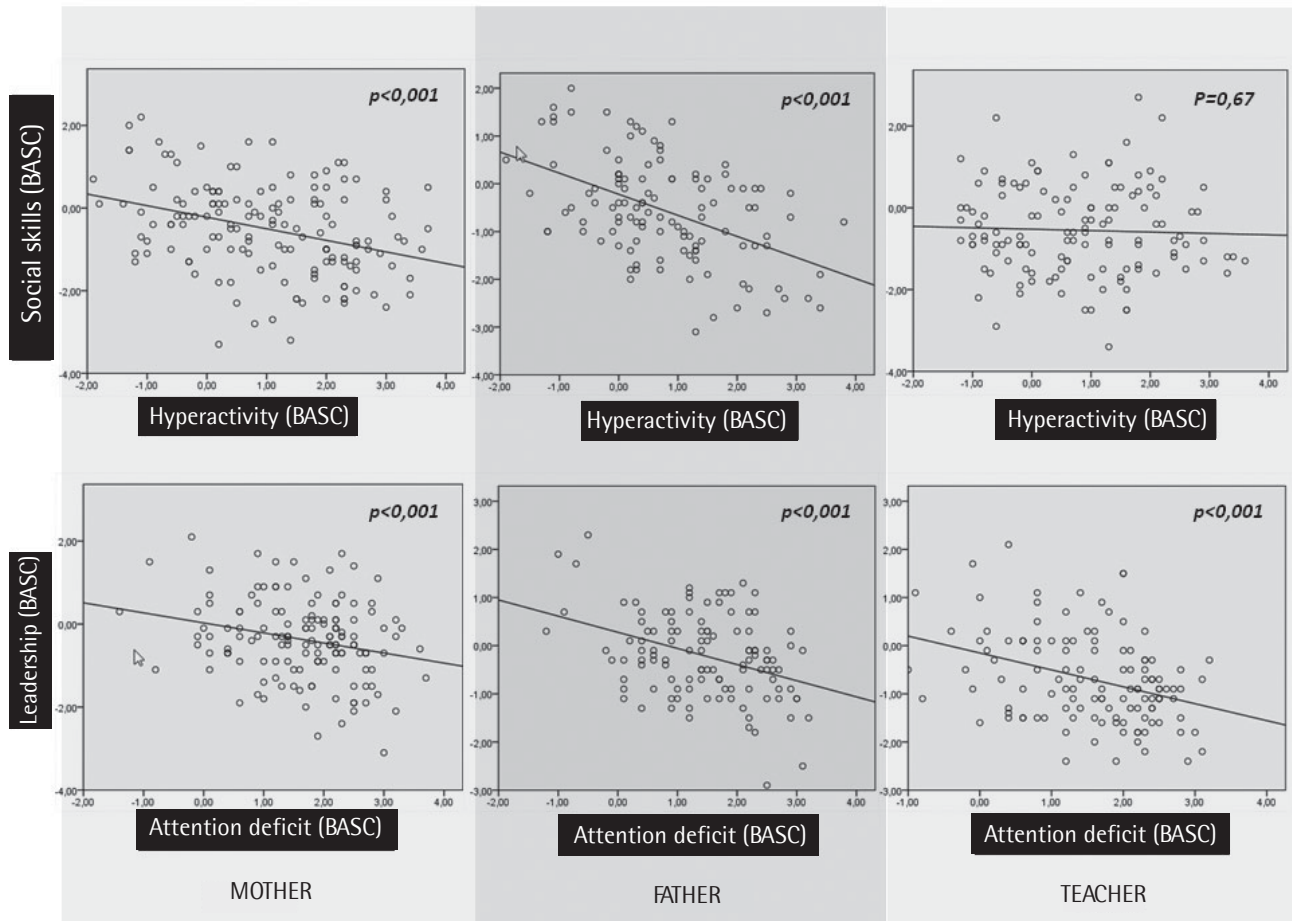


Figure 4

Upper half: linear relation between the symptomatic intensity of the ADHD, quantified through the section "hyperactivity" of the BASC with the section "social skills" of the BASC per se, filled out by parents and teachers (provided in Z values).  
 Lower half: linear relation between the symptomatic intensity of the ADHD, quantified through the section "Attention deficit" of the BASC with the "leadership" section of the BASC per se, filled out by parents and teachers (provided in Z values).

In the analysis of the symptomatic intensity of the ADHD, quantified through the sections "hyperactivity" and "Attention deficit" of the BASC and E-DHD, and its relation to the sections "social skills" and "leadership" of the BASC itself, filled out by the parents and professors, the following could be observed:

- There was a statistically significant relation ( $p < 0.01$ ) between the scores obtained according to the different informed in the section "hyperactivity" of the BASC and E-DHD. The greater the intensity of the hyperactivity according to the mother, the greater it was according to the father and teacher.
- There was an equally significant relation ( $p < 0.01$ ) between the scores recorded according to the mother, father and teacher in the section "attention deficit" of the BASC and E-DHD.
- An inversely significant and linear relation ( $p < 0.001$ ) was observed between the intensity of the "hyperactivity" and the "social skills" according to the BASC of both parents. This relation was not significant when the teacher was the informer (figure 4).
- The "hyperactivity" score according to the BASC and E-DHD did not show a significant relation to the section "leadership" of the BASC, independently of the informer.
- The "attention deficit" score according to the BASC and E-DHD had a markedly significant, negative and linear relation ( $p < 0.001$ ) with the "social skills" and "leadership" sections independently of whether the informer was the

parents or teacher (figure 4).

- The "attention deficit" score according to the BASC filled out by the mother was inversely and significantly correlated ( $p < 0.01$ ) with the scores of "leadership," regardless of whether the latter section of BASC was filled out by the mother, father or teacher. The "attention deficit" score according to the BASC filled out by the father or teacher did not correlate with the "leadership" scores if the latter section of the BASC was filled out by the teacher or father, respectively.

## DISCUSSION

Relations with classmates are the key indicator of social ability, that is, of the ability to achieve social or personal success in social situations. Acceptance or judgment of peers (sociometric indicators) are indirect measurements of this social functioning,<sup>6</sup> which may vary greatly based on the cultural society where they are applied.<sup>7</sup> These sociometric indicators clearly indicate that between 50 and 75% of children with an ADHD<sup>6,8</sup> are rejected by their peers. The rejection is generally persistent and resistant to medical and psychoeducational treatment, even after symptomatic improvement after drug treatment is introduced.<sup>2,8</sup> Behavior patterns associated to inadequate social functioning that affect the quality of interpersonal interactions have been identified, these being: verbal and physical aggressions, negative behaviors when entering into new groups or in class (being noisy, bothersome, breaking rules, fighting, etc). Less adaptative capacity to change their communication patterns is associated based on the demands of the task and the child's style of response has negative effects on the behavior of their peers.<sup>6,9</sup> Children with combined ADHD have higher rates of this type of behavior: behaviors that are disruptive, aggressive, unpredictable, oppositional, out of place, noisy, breaking rules, unexpected and inappropriate acts. This could explain the relation observed in our study between the intensity of the hyperactive and impulsive symptoms and the low scores on the social skills sections of the BASC according to the parents.

Social skills have been recognized for some time as keys for an adequate adaptation. The importance of the development of the social skills in children is known and this has resulted in their being included for evaluation in the BASC scale or other scales such as the Vineland Adaptative Behavior Scale,<sup>10</sup> although they should not replace more specific scale of ADHD, both in the evaluation of children and adults.<sup>11, 12</sup> The scores on the social skills scale have important diagnostic and treatment implications. A low score by the teacher could indicate the convenience of social skills training.<sup>4</sup> The individual elements can determine the specific behaviors that need to be worked on. Considering social skills as an adaptative characteristic helps the examiner

to make the differential diagnosis among some behavior disorders. The "leadership" scale in the teacher and parent evaluate other abilities related with good adaptation to the community and to the school. This scale was developed to evaluate behaviors that may be associated with the leadership potential.<sup>4</sup> Some of the elements of the scale are very much related with cognitive skills involved in problem solving, as having many ideas, making good suggestions and making decisions easily.<sup>4</sup>

In the present study, it has been possible to verify that in the "social skills" section of the BASC, boys tended to obtain lower scores than girls according to their mothers and fathers. However, these differences were not significant and in the case of the professors, there was no tendency to allot any type of advantage based on gender. These data indicate that social incompetence is related with factor other than gender in the ADHD.

The grade of self-control is fundamental for adequate socialization to occur.<sup>13</sup> Girls with ADHD may have lower skills in regards to social behavior and unadequate motivation for them even though there is generally adequate social reasoning.<sup>13</sup> This uncontrolled behavior which we could define as "dysfunctional" impulsiveness would be related with the behavior disorders and therefore with typical criminal behaviors of the anti-social disorder.<sup>2, 13</sup> Therefore, it is also not surprising that boys with ODD or with AD would have significantly fewer "social skills" according to the parents than girls without ODD or AD, regardless of gender and ADHD subtype. In fact, as could be expected, aggressiveness is associated with low indices of social abilities,<sup>2,14</sup> and although the specific social problem solving tasks are defective in patients with ADHD, they are much more so in those with ODD and/or antisocial behavior (AD) and even worse if the latter are associated to ADHD.<sup>14</sup> Importantly, we only obtained significant results in the combined subtype of ADHD and social skills capacity when this was evaluated by the father (the null correlation in the case of the teachers stands out), so that the fundamental symptoms of hyperactivity and impulsiveness can also not explain by themselves the social relations problems of the patients who suffer this disorder,<sup>8</sup> as other problems may be involved that are more easily explainable from the neuropsychological view such as that of "social perception" (an inadequate adjustment between what the patient does and what the patient in turn perceives as social feedback), more related with the baseline executive dysfunction than with the affective measures in the clinical scales.<sup>8</sup> Although there are hardly studies in this regards and the results of the few existing ones are in disagreement, it is possible that many patients with ADHD, regardless of the subtype, inadequately interpret, although not necessarily hostilely, as occurs in the anti-social disorder, most of the behaviors of their peers.<sup>8</sup>

Undoubtedly, the BASC scale does not really evaluate social skill or leadership ability but rather social behavior, which may be closely linked to Attention Deficit Hyperactivity, from the observational point of view. This circumstance always conditions the results of this and other studies. However, either directly related or conditioned by a common executive dysfunction, patients with elevated scores in the "hyperactivity" section conclusively show worse "social skills." In addition, when the "attention deficit" was evaluated, the correlate that was inversely proportion to "leadership" was clear. Pharmacological treatments have demonstrated greater immediate significance in the reduction of the fundamental symptoms of ADHD and consequently of the social behaviors.<sup>6,13</sup> However, do these treatments really improve the social skills of these children? And if they do so, do they improve them through the improvement of the core systems of the ADHD or through the readjustment of the baseline executive function that characterizes these patients? In the daily clinical experience, many of the patients with ADHD improve their social behavior when they begin with pharmacological treatment, but they do not always improve their social competence.<sup>6,8</sup> Thus, psychopedagogic treatment takes on special importance,<sup>8</sup> especially in the maintenance of long term improvements, which is a difficult-to-achieve goal.<sup>13</sup>

Parallely, not only the self-control deficit worsens the behaviors inclined towards social relations because different studies have shown that boys with ADHD with the predominantly inattentive type also show this type of problem, but in a different form.<sup>15</sup> While the peers generally more actively reject boys with combined ADHD due to their manifest problem in the regulation of their emotions, boys with inattentive ADHD may be defined as having a tendency to social withdrawal or as "timid" or "passive"<sup>8, 15-17</sup> who are sometimes "incapable of attending to or even remembering the conversations."<sup>8</sup> This different pattern of social behaviors suggests that the lack of attention contributes to greater problems for active participation in the social interactions while the hyperactivity and impulsiveness symptoms contribute to greater aggressiveness, above all verbal, with the peers.<sup>8</sup> Although this latter pattern seems to be more frequent in boys with ADHD, girls with combined ADHD are perceived similarly by their peers when they are interviewed.<sup>8</sup>

Other results offer more subtle data. In the study of the "leadership" field, there is a non-significant tendency for girls with predominantly inattentive type ADHD to have lower scores and also, patients with ADHD and AD or ODD did not score as significantly low in this sections as they did in the "social skills." While the latter item is defined as the skill necessary to interact satisfactorily, leadership would be related more with social initiative, that generally is affected in inhibited patients or those with anxious-depressive symptoms.<sup>7</sup> Even more, certain behaviors that would include

disruptive-aggressive behaviors are frequently based on low self-control but high social initiative (extroverted individuals) while the timid-inhibited behaviors (introverted, passive individuals) would be related with low social initiative and adequate self-control.<sup>7</sup> These latter qualities are easier to obtain in female patients with attention deficit ADHD subtype (especially in the case of the so-called *slow cognitive time*).<sup>18</sup> Although in this study, the presence of anxiety hardly influenced the results and the mood state disorder was associated to fewer social skills in general, we should remember that the external informers are less reliable than the children themselves in the evaluation of the "internalizing" disorders such as depression or anxiety,<sup>19</sup> so that more studies that collect reports from the patient per se would be necessary to gather more information in this regards.

Regarding the contradictions found between parents and professions in the BASC, we should remember that the correlations between parents and teachers are low or moderate, with a tendency to increase with age.<sup>4</sup> The correlation regarding these skills between father and mother is higher, although persistently poor.<sup>4</sup> The poor capacity of the teacher to offer significant results in any of the comparisons between disorders is of interest. No significant problem in social skills or leadership in the AD patients was observed from this point of view. Is it possible that the teachers perceive a "defiant" and "oppositional" (ODD) patient as less socially skilled than a "vengeful" boy with criminal tendencies (AD)? Regarding this interesting finding, we could establish some hypotheses. While the aggressiveness observed in the patients with ADHD without behavior disorder could be more "reactive" and "impulsive," in the patients with said disorder, this could be considered as more "instrumental" or "premeditated," AD being the paradigm of said "premeditation."<sup>20</sup> Thus, the Ohan et al. study found more girls with ADHD without ODD with impulsive behaviors than girls with ADHD without ODD.<sup>21</sup> On the other hand, in the Matthys et al. work, the males with ADHD, compared to the males with ADHD and ODD or AD and to boys with only ODD or with AD, showed greater deficits in the encoding of social keys and generated more anarchic hypothetical responses to certain social situations shown through videos.<sup>14</sup> On the contrary to the boys with AD, who tend to "harass" the social keys, males with ADHD without AD tend to randomly misinterpret said keys. This suggests that the deficits in the information processing in boys with ADHD may be related with poor regulation of attention to said keys and to poor social reasoning (poor interpretation, integration and organization of the social keys).<sup>22, 23</sup> This could suggest that the boys with AD, in spite of suffering a more severe disorder, can manage their behavior more consciously and therefore seem to be more "social" for their professors than those with ADHD or with ADHD and ODD, with worse regulation of their behavior.<sup>8</sup> The responses to other unknown aspects suggested by the present work, such



as the anarchic relation between the different comorbidities and the "leadership" section of the BASC and the poor social capacities that a sad and depressed male may manifest (similar, and for the teachers even worse, than a male with AD) may arise from this complex interaction.

In conclusion, this study shows that the social skills measured with the BASC are related, in the opinion of the parents, to symptomatic intensity of the ADHD (both with hyperactivity-impulsiveness and with attention deficit) and to the presence of behavior comorbidity (AD and ODD). Statistically significant data were not obtained regarding these or other variables when the teachers were the informers (except in the case of the intensity of the attention deficit according to the BASC or the E-DHD) nor regarding their possible relation to gender, ADHD subtype, presence of anxious and/or depressive symptoms, when the parents were the ones being interviewed. Regarding the leadership capacity measured in the BASC, this was only found to be related to the intensity of the attention deficit according to the BASC and E-DHD regardless of the informer. We consider that studies are needed that evaluate the neuropsychological functions and not only the clinical ones to obtain more data on the relation between ADHD and social dysfunction or incompetence of these patient. In addition, in an era that is influenced by genetics and neuroimaging, where the study between genetic levels, neuroimaging and cognitive-behavioral profiles are clear in different neurodevelopment disorders,<sup>24</sup> it would be equally important to evaluate the relation among the previously mentioned factors and the school and social functioning of these patients. Up to date, it has been possible to observe significant relations between certain allelic forms on the genetic level and neuroimaging, especially in the measurement of the cortical thickness. Equally, marked relations between the cortical thickness and symptomatic intensity of the patients with ADHD have been seen. The response to the pharmacological treatment in these cases has been correlated to differential cortical developments and to unequal clinical responses according to these allelic forms. However, again, social and academic functioning has not been analyzed in this type of study. In a neurobiological view of a dysexecutive disorder with ADHD, social competence should also be analyzed from these perspectives.

#### CONFLICT OF INTERESTS

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