

## **Attention Deficit and Hyperactivity in the classroom: assessing children's perception through their drawings**

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For children in general, and in particular for students who find it difficult to manage their behaviors and levels of attention, the classroom may prove to be an “unsuitable” environment. Our study involved 124 students from the first three grades of primary school, taken from several schools of Italy's Piedmont region. We divided the participants into two groups: an Experimental Group (EG), composed of 60 children who, according to their teachers, manifested ADHD symptoms, and a Control Group (CG). We used various instruments (e.g., STRS, SDQ, Class Play, Attribution Test) in order to assess children's behavior and the quality of the relationships in the classroom of both groups involved. Our study is based specifically on results obtained from the administration of the “Class Drawing” graphic test. This method, in line with other tools used for confirming data taken from the relevant literature, does not focus solely on investigating the quality of the student-teacher relationship, but it also takes into consideration the difficulties that may be encountered by children with ADHD in specific behavioral areas, namely socialization and affectivity.

*Keywords:* ADHD, primary school, children's drawings, class drawing, student-teacher relationship.

*Déficit de atención e hiperactividad en clase: evaluar la percepción del niño a través del dibujo.* Para el niño que tiene dificultades en prestar atención y en controlar su comportamiento, el aula podría resultar un entorno “inadecuado”. Nuestro estudio implica a 124 alumnos de primero, segundo y tercero de primaria de algunas escuelas piamontesas. Los sujetos se han dividido en dos grupos: un grupo experimental (GE), compuesto por 60 niños que, según los maestros predominantes, presentan déficit de atención y comportamientos hiperactivos, y un grupo de control (GC). Para detectar el comportamiento y la calidad de las relaciones que caracterizan la vida en la clase de los dos grupos, se han utilizado diferentes test (ej. STRS, SDQ, Class Play, Prueba de atribución). En este artículo aparecen, en concreto, los resultados obtenidos a través del test gráfico “El dibujo de la clase”. Esta herramienta que, al igual que las otras confirma los datos de la relativa literatura y subraya la calidad de la relación maestro-alumno, tiene en consideración las dificultades del niño con dicho “trastorno” con respecto a específicas áreas del comportamiento, especialmente el área de la socialización y la afectividad.

*Palabras clave:* ADHD, escuela primaria, dibujo infantil, dibujo de la clase, relación maestro-alumno.

The school environment is one of the most important settings for children's cognitive, social and emotional development (Birch & Ladd, 1996; Aureli *et al.*, 2008). Even though it is aimed at being the "natural venue" for child growth, this setting is not always without its difficulties. In the classroom, one must abide by the rules, meet educational requirements and perform the assigned tasks. For children in general, and in particular for students who have difficulties managing both their behavior and attention, the classroom may prove to be an "unsuitable" environment (Kos *et al.*, 2006).

Teachers are well aware of the extent to which learning relies on a child's capacity for attention (Tournaki, 2003) and of the importance of good behavior for achieving academic success (Witek & Little, 1996), however they often do not have the appropriate tools, or lack the specific training to interact effectively with subjects who present difficulties in these respects. It is important to underline that teachers complain of problems and difficulties associated with ADHD increasingly often. In every class there seem to be at least two cases of children who manifest clear symptoms, but have no actual diagnosis of ADHD (Di Pietro *et al.*, 2001); on the other hand, if there is a diagnosis, there are no specific legal provisions mandating the presence of a teacher's assistant (TA) for the support of the child.

Therefore, teachers are required to establish a relationship with some children with the following characteristics (Cornoldi *et al.*, 2001):

*Sustained attention deficit*: children find it difficult to focus on only one source of information and are easily distracted by outside stimuli; they do not seem to listen when they are addressed directly, often failing to follow instructions; these children's work looks untidy and incomplete, they appear unable to manage and organize their material.

*Hyperactivity*: children move and talk excessively, keep shifting from one activity to another, never stop moving, and are intolerant to any form of restraint, especially when they are tired;

*Impulsiveness*: children tend to act before thinking (e.g., answering before the question has been completed, speaking out of turn, interfering with other people's conversations, making comments that are out of place). These children may engage in dangerous actions without considering the possible consequences. Their work often lacks effort and care.

The aspects described above generally tend to take on different nuances depending on gender-related traits: boys mainly show difficulties associated with movement control, girls show reduced capacities especially in terms of attention and organization (Abikoff *et al.*, 2002). Among girls, moreover, impulsiveness mostly appears in the form of verbal as opposed to physical hyperactivity (Marzocchi, 2003).

Concerning the cognitive aspect, even though their intellectual capabilities are normal, the school results of these subjects are often compromised (Apa, 2000; Marshall

*et al.*, 1997). Attention deficits and behavioral disorders, however, create even more problems on the level of social adjustment, with serious consequences for the integration of these children in a school setting. In terms of social adjustment, indeed, children suffering from ADHD often appear anxious, introverted and shy; consequently, it seems that they take on –as a sort of defense mechanism– a confrontational and aggressive attitude (Carlson, 1997). These elements have negative impacts on their relationships with both their teachers (Birch & Ladd, 1998; Pianta *et al.*, 1995) and their peers (Barkley, 2004; Mikami, 2010).

Many teachers complain that they feel powerless when interacting with students who are distracted or impulsive, even though they employ all their resources (Kos *et al.*, 2006). Teachers often react to this failure in didactic-educational terms by increasing their punitive control and sometimes adopting an aggressive attitude. Most of the teachers, furthermore, acknowledge that they are pessimistic about these children's possibilities for academic success (Kauffman *et al.*, 1989). Pupils suffering from ADHD state that the teachers frequently address orders and control requests at them, while usually dedicating more time to their classmates (Peter *et al.*, 1983).

It is highly probable that the attitude adopted by adults also influences the perception that the classmates have of the child in question (Hughes & Kwok, 2006). Distracted and/or impulsive children are often rejected by their peers due to their impulsive and aggressive attitude and inability to interpret and respond adequately to other people's social signals (Erhardt & Hinshaw, 1994). The friendship bonds that are formed, are generally weak and do not last long (Kellner *et al.*, 2003).

The daily failures experienced by children in school settings have a negative impact in terms of self-esteem, thereby increasing any form of antisocial and maladjusted behavior. In spite of the multiple effects that this condition has on children's wellbeing, not much research has been done on analyzing the events and feelings experienced by students in the school setting (Francescato *et al.*, 2002).

This work, therefore, is aimed at highlighting any differences encountered between those who are pointed out by teachers as being especially distracted or hyperactive and those who seem to be well adjusted to the school requirements. The behavioral areas taken under consideration refer to the main dimensions that constitute the school setting (i.e., classroom, teachers and classmates), as highlighted in the "Class Drawing".

## METHOD

### *Participants*

The study involved 124 Italian students, 82 boys and 42 girls, with an average age of 7.83 ( $SD=.80$ ) years. The students came from 20 elementary school classes (from first to third grade) in the Piedmont region of Northwestern Italy.

The subjects who, according to the average evaluation of their classroom teachers, scored higher than nine in the SDAI for at least one of the two scales, were placed in the Experimental Group (EG); among the remaining students of each classroom, four children were randomly chosen (two boys and two girls) for the Control Group (CG). Therefore, the sample consisted of 51.6% students ADHD symptoms (GC) and 48.4% children from the Experimental Group. In most cases (i.e., 76.7%) the members of the EG had scores which placed them in the “at risk” category in both of the SDAI subscales (i.e., Attention Deficit, and Hyperactive and Impulsive Behavior). Eleven children showed only Attention Deficits, and three cases had problems that were exclusively associated with Hyperactivity.

We measured the main student data (i.e., school and personal data) using an ad hoc questionnaire that was subsequently filled out by the teachers. The results are listed in table 1.

Table 1. The main personal and school data regarding EG and CG.

Descriptive statistics		EG	CG
		(n=60)	(n=64)
Age in months	Mean	96.56	93.93
	SD	8.801	10.976
Gender	Males	83.3% (50)	50% (32)
	Females	16.7% (10)	50% (32)
Grade	The 1st	11.7% (7)	18.7% (12)
	The 2nd	28.3% (17)	31.3% (20)
	The 3 <sup>rd</sup>	60% (36)	50.0% (32)
Academic achievement	Low	78.3% (47)	17.2% (11)
	High	21.7% (13)	82.8% (53)
Effort at school	Low	93.3% (56)	21.9% (14)
	High	6.7% (4)	78.1% (50)

Compared to the CG, the EG had more boys ( $\chi^2=14.389$ ;  $df=1$ ;  $p<.001$ ), pupils with low academic achievement ( $\chi^2=47.976$ ;  $df=1$ ;  $p<.001$ ) and who were making little effort at school ( $\chi^2=63.500$ ;  $df=1$ ;  $p<.001$ ). The data confirm the literature regarding the prevalence of the disorder with reference to both the male sample and learning difficulties.

### *Instruments*

In order to measure the frequency with which children reveal hyperactive or attention deficit behaviors, the two prevalent teachers in each classroom filled out the SDAI, *Scale for Attention Deficit and Hyperactive behaviors* (Cornoldi *et al.*, 1996). The test consists of 18 items that were based on DSM-IV diagnostic criteria (APA, 2000). Nine items assess the hyperactivity-impulsiveness dimension, and the remaining nine assess the attention deficit dimension. For each statement the respondent is asked to score the frequency with which the said behaviors appear (i.e., 0=never, 1=sometimes,

2=quite often, 3=very often). A score of at least nine on an individual scale is considered an indication of risk cases.

The instrument used here to study the elements under examination is the "Class Drawing", a graphic semi-projective method designed by Quaglia and Saglione (1990). This tool makes it possible to analyze the children's perception of their wellbeing at school, with specific reference to the various elements that characterize life in the classroom: the teacher, the classmates, and the classroom. With each of these elements, the subject establishes a relationship in the role of a student. The test has been subjected to studies aimed at investigating its validity and has revealed good psychometric qualities (Longobardi *et al.*, 2009; Pasta & Quaglia, 2010; Pasta, 2011). The specific assignment is: "*Draw your classroom; draw it any way you wish*". The children were interviewed individually after finishing their drawings in order to determine what each child had represented and the reasons for any omissions.

As the authors suggest, the drawings were interpreted at content level. That is, the forms of devaluation (e.g., suppressing, depicting without care, moving away, reducing the size of a person) are to be interpreted as defensive mechanisms and attempts at reassurance when faced with distressing and problematic situations to which children are unable to adapt. Conversely, the elements of the class that are represented accurately and valorized (e.g., subjects who are physically present, depicted with care, close, proportionate) are interpreted as demonstrations of positive affective investment on behalf of the child, which thus exhibits a relationship of trust in them.

In order to have a coding of the products as analytical and schematic as possible, the scaling of the Total Score was made to be dependent upon four sub-scores, one for each aspect of the drawing (i.e., Self, Classmates, Teacher and Classroom). Higher scores are considered associated with a qualitatively better perception of the child's relationships with the various aspects of life at school, therefore implying higher wellbeing in the classroom. Some of the nominal scales (e.g., presence, care, position, size, perspective, etc.) provide further insight to the value attributed by the subject to the individual elements in the classroom.

The dimensions of school experiences studied using the classroom drawing were also highlighted using other instruments whose results will be briefly outlined in order to provide a general overview of the participants' characteristics. The teachers were asked to fill out individually the STRS (Fraire *et al.*, *in press*) and together the SDQ (Marzocchi *et al.*, 2002). The students' social and academic capabilities were assessed through their classmates using the Class Play technique (Masten *et al.*, 1985). Finally, each of the pupils had to fill out an Attribution test (De Beni *et al.*, 1998) which had the purpose of highlighting the prevailing cause attributed to success or failure in various situations.

*Procedure*

We analyzed the data using the PASW 18 statistical analysis software.

**RESULTS**

Both groups (EG and CG) exhibited significantly different scores in all the dimensions assessed through the tests administered (see table 2). The data –after having been subjected to more in-depth analysis– confirmed the long-standing research results on this topic.

Teachers perceive the relationships with distracted and/or hyperactive students as being much more confrontational when compared to relationships with other pupils. Children who suffer from ADHD are very ambivalent towards adult figures: on one hand they show dependence and the desire to be accepted, on the other, they seem incapable of establishing intimacy in relationships. The teachers' evaluations, in the form of the SDQ, confirm the highly problematic behavioral and emotional levels exhibited by the EG. Furthermore, the data provided by the peer group show that pupils in the EG –compared to those in the CG– find it much more difficult to adjust to the community and school settings. Finally, distracted and impulsive pupils have a tendency to attribute their success or failure to external causes more often than the children in the CG, thus confirming their tendency to take on maladjusted attributing styles (Boscolo, 2006; Cornoldi, 2007).

Table 2. Significance of differences between medium values (EG, CG)

Test Dimensions	Sig.
STRS Conflict	<.001
STRS Closeness	<.001
STRS Dependency	<.001
SDQ Emotional Symptoms	<.001
SDQ Conduct Problems	<.001
SDQ Hyperactivity and Attention Deficit	<.001
SDQ Peer Problems	<.001
SDQ Prosocial Behavior	<.001
SDQ Total Difficulties	<.001
CLASS PLAY Prosocial Aspect	<.001
CLASS PLAY Antisocial Aspect	<.001
CLASS PLAY Scholastic Aspect	<.001
CLASS PLAY Asocial Aspect	<.05
ATTRIBUTION TEST External Help	<.05

Student's *t* test: \*  $p < .05$ ; \*\*  $p < .001$

Concerning the drawing of the elements that make up the school environment (Classroom, Teacher, Classmates), we noticed significant differences between CG and EG in their Total Class Drawing scores ( $t = -3.995$ ;  $df = 122$ ;  $p < .001$ ). The EG subjects showed a smaller number of elements that referred to a perception of wellbeing in the

classroom, expressed more specifically in the Teacher ( $t=-4.016$ ;  $df=122$ ;  $p<.001$ ) and Classroom ( $t=-4.624$ ;  $df=122$ ;  $p<.001$ ) dimensions.

If we analyze the methods used by students of both groups to depict the classroom furniture and the teacher's figure, we can distinguish two different graphic styles (see table 3).

Table 3. Class Drawing Descriptive statistics: Means (Standard Deviation), Percentage Frequency (EG, CG)

Elements of Class Drawing	EG	CG
CLASS DRAWING TOTAL**	6.98 (2.873)	9.10 (3.03)
SELF TOTAL	1.084 (1.07)	1.26 (1.034)
<i>Presence and care</i>		
Absent	42.4%	32.3%
Element (ex.: drawer's desk, schoolbag)	16.9%	20.0%
As a person not carefully drawn	30.5%	36.9%
As a person carefully drawn	10.2%	10.8%
<i>Position Self-Classmates</i>		
Far away	63.1%	32.1%
Near	36.9%	60.1%
Contact	-	7.8%
<i>Size Self-Classmates</i>		
Lower	10.5%	
Equal size	89.5%	100%
CLASSMATES TOTAL	1.88 (1.34)	2.24 (1.40)
<i>Presence and care</i>		
Absent	18.6%	15.4%
Element	30.5%	23.1%
All classmates not carefully drawn	3.4%	1.5%
Some classmates not carefully drawn	39%	41.5%
Some classmates carefully drawn	8.5%	18.5%
How many classmates	2.51 (4.356)	3.25 (4.334)
CLASSROOM TOTAL**	2.74 (1.138)	3.55 (.791)
<i>Care**</i>		
No care	5.1%	-
Low care	59.3%	26.2%
High care	35.6%	73.8%
<i>Where</i>		
Outside the school	5.1%	-
Closed	20.3%	9.2%
Open	74.6%	90.8%
<i>Perspective**</i>		
From above	33.3%	7.8%
Frontal	66.7%	92.2%
<i>Teacher's desk. Presence and care**</i>		
Absent	30.5%	20.0%
Low care	50.8%	32.3%
High care	18.6%	47.7%
<i>Blackboard. Presence and care**</i>		
Absent	30.5%	10.8%
Low care	50.8%	43.1%
High care	18.6%	46.2%
TEACHER TOTAL**	1.27 (1.047)	2.04 (1.095)
<i>Presence and care**</i>		
Absent	28.8%	13.8%
Element (ex.: teacher's desk, bag)	30.5%	15.4%
As a person not carefully drawn	25.4%	23.1%
As a person carefully drawn	15.3%	47.7%
<i>Position Teacher-Pupils*</i>		
Far away	78.2%	70.0%
Near	21.8%	30.0%
<i>Size Teacher-Pupils*</i>		
Lower	-	5.1%
Equal size	36.4%	51.3%
Higher	63.6%	43.6%

Student's *t* test or Chi-squared test: \*  $p<.05$ ; \*\*  $p<.001$

In the drawings of children from the EG, the classroom is drawn from above ( $\chi^2=15.328$ ;  $df=2$ ;  $p<.001$ ) and rather carelessly ( $\chi^2=19.551$ ;  $df=2$ ;  $p<.001$ ). Drawing things from above places the person drawing outside the picture and, in our case, outside the classroom, as if to underline a sense of freedom from what is represented or alienation. In any case, children from the EG seem to distance themselves, both emotionally and physically, from a setting which they consider hostile, unwelcoming, and possibly feared. The classroom entails a long set of rules that need to be followed and various assignments to be completed. Paying attention, remaining seated, organizing one's work, following the instructions received: these are obligations that a child who suffers from ADHD finds impossible to abide by. The classroom space in the drawing, therefore, becomes a place of constriction and of suffering; the drawing, through the scarcity of graphic elements that identify the classroom, becomes an expression of the unhappiness experienced by the child in the EG.

For the same reason, the figure of the teacher, i.e. the person in charge of ensuring order and respect of the rules, appears scaled down in the drawings made by children in the EG, compared to those in the CG. Children with ADHD significantly omit the teacher as a character ( $\chi^2=11.466$ ;  $df=2$ ;  $p<.005$ ) or their drawing is done in a hurry and carelessly ( $\chi^2=16.589$ ;  $df=2$ ;  $p<.001$ ). The teacher's picture, moreover, is often drawn at a distance from the class ( $\chi^2=6.765$ ;  $df=2$ ;  $p<.05$ ) and it is considerably larger in size than the other students' figures ( $\chi^2=9.085$ ;  $df=3$ ;  $p<.05$ ). In other words, the teacher is seen as an unapproachable and looming person. Furthermore, in this case, the graphic test reveals problem issues pertaining to the relationship between the teacher and the hyperactive/distracted student.

The teacher's desk and the blackboard, elements that respectively evoke both the role of the teacher and the cognitive dimension, are often omitted or drawn carelessly by pupils in the EG; more specifically by those who suffer from attention deficits. Explicit attempts are made, according to the readings of the "Class Drawing" test, to devalue the teacher's figure through the elements that identify it from a graphical point of view.

Both the EG and the CG showed no statistically significant differences in the representation of the self and of the classmates which are, in fact, depicted with similar frequency by both groups. This result might seem contradictory considering the scarce value of the graphic element attributed to the classroom; instead, it shows the great need that a hyperactive child has to be among other people.

We are convinced, in spite of the graphic similarities, that the two groups express different emotional situations. Hyperactive children are incapable of being *with* someone else, that is to say, of working together on a project; the others are mainly presences that help to overcome a feeling of loneliness. The frequency distribution of graphic indicators related to the position and size chosen by the child to depict him- or

herself seem to confirm this assumption. It is possible to conclude that children in the EG tend –more than those in the CG– to draw themselves further away and smaller in size compared to the figures that portray their peers, thus highlighting a less involved and less “equal” relationship. Another set of data which emerges from analyzing the index frequencies of “Class Drawing” is that children in the EG are more careless than those in the CG when drawing their classmates. This result, which may be interpreted simply as the impossibility for a hyperactive subject to concentrate on an assignment, due to the stereotyped drawing of classmates’ figures and especially to the absence of any interaction with these characters, may also be interpreted as detachment or emotional distance from the others.

Finally, the attitude that the two groups showed towards the graphic test should be noted: children in the EG appeared more anxious, nervous and confrontational, both when the assignment was explained ( $\chi^2=11.737$ ;  $df=1$ ;  $p<.005$ ), and while drawing the picture ( $\chi^2=17.024$ ;  $df=1$ ;  $p<.001$ ). Relevant differences were also recorded with reference to the actual drawing time ( $\chi^2=25.083$ ;  $df=1$ ;  $p<.001$ ), to the type of line used ( $\chi^2=14.322$ ;  $df=1$ ;  $p<.001$ ) and to the pressure applied on the sheet of paper ( $\chi^2=7.698$ ;  $df=1$ ;  $p<.01$ ).

## CONCLUSIONS

The “Class Drawing” highlighted relational aspects and behavioral traits associated with subjects suffering from symptoms of ADHD in the Experimental Group. This research, in fact, had the aim of underscoring the graphic qualities of Children with ADHD, as well as the instrument sensitivity of the “Class Drawing” test, with regard to the graphic translation of the behavior of subjects with these characteristics. The drawing assignment, with the request to portray a child’s classroom, teacher and classmates, forces distracted/hyperactive children to confront their unhappiness and expression forms. The expressions of unhappiness –that is to say, the problems relating with peers, school issues, and the difficulties in managing the relationship with authoritative figures– are indeed the contents of the drawing. The analysis of such contents, conducted mainly on graphic index characters, may provide some elements to integrate –when assessing possible changes in conduct– the data obtained by means of observation or through other tools. The assignment to “draw your own classroom” is not an invitation to reproduce a class photograph, but rather a request to communicate graphically to *what* extent and *how* one’s classroom is *interesting*. The graphic indicators may highlight both the level and the quality of this interest, and together provide indications as to the most important source of unhappiness for the child. According to a currently accredited concept for the interpretation of drawings (Corman, 1967; Tambelli *et al.*, 1995), namely that the element causing the greatest unhappiness is omitted from the drawing, it is easy

to find which element does not feature in the classroom. If it is the teacher, then the greatest attention should be paid to the child's relationships with his or her parents. It is not infrequent that subjects with this kind of disorder have families with a limited sense of parental skill and confrontational interactions (Ammaniti, 2001). If the classroom is missing, then attention should be paid to cognitive malfunctions. In this case, the most serious problems could affect school activities. If instead the classmates that are missing, the subject may be wishing to express any unhappiness linked to rejection from the peer group.

Contrary to widespread belief, children suffering from this disorder are anything but superficial and careless with respect to others; actually, these children are unable, as a consequence of events whose origin is yet unknown, to relate to others and to get their attention.

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