



# Perceived Parenting Style and Self-Perception in Children with Attention Deficit/Hyperactivity Disorder

Estilos Parentales Percibidos y Auto percepción en Niños con Trastorno por Déficit de Atención con Hiperactividad



Research

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## ARTICLE INFO

### ABSTRACT

Background: there is a growing interest in the study of the self-perceptions of children with Attention Deficit/Hyperactivity Disorder (ADHD) and the bias in their self-concept. Goal: to explore how ADHD children's perception of parenting style predicts their self-perception and the bias in self-concept. Method: Participants: children between 7 and 13 years old diagnosed with ADHD, children assisting to psychotherapy without an ADHD diagnose, and children not assisting to psychotherapy. It also participated one of their parents. Data analysis: It was used simple logistic regressions. Groups were studied separately. Results: maternal pathological control was the main predictor of ADHD children's positive self-perceptions and bias. In the comparison groups it predicts negative self-perceptions. Results are discussed in the light of self-protection hypothesis.

### RESUMEN

Antecedentes: existe un creciente interés en el estudio de las auto percepciones y el sesgo vinculado a ellas en los niños con Trastorno por Déficit de Atención con Hiperactividad (TDAH). Objetivo: explorar cómo los estilos parentales percibidos por los niños con TDAH predicen sus auto percepciones y su sesgo. Método: Participantes: niños de entre 7 y 13 años diagnosticados con TDAH, niños que asisten a psicoterapia pero no tienen un diagnóstico de TDAH y niños que no asisten a psicoterapia. También participó uno de los padres de estos niños. Análisis de datos: Se realizaron regresiones logísticas simples. Los grupos se estudiaron por separado. Resultados: el control patológico materno fue el principal predictor de las auto percepciones positivas y el sesgo positivo en niños con TDAH. En el grupo de comparación dicha forma de control predijo auto percepciones negativas. Los resultados se discuten en el marco de la hipótesis de autoprotección.

### Article history:

Received: 18-07-2014

Revised: 18-09-2014

Accepted: 19-12-2014

### Key words:

attention Deficit Disorder with Hyperactivity, Parenting styles, Self-perceptions, Self-concept.

### Palabras clave:

trastorno por déficit de atención con hiperactividad, estilos parentales, auto percepciones, auto concepto.

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## 1. INTRODUCTION

Attention Deficit/Hyperactivity Disorder (ADHD) is a persistent pattern of inattention, hyperactivity and impulsivity more severe and more frequently displayed than what is expected for the stage of development at which it presents (American Psychiatric Association, 2002). This disorder is one of the most frequent in childhood (American Academy of Pediatrics, 2000). These children usually present a wide range of difficulties, associated with the disorder, in the cognitive, interpersonal, affective, and behavioral domains (Owens, J. S., Goldfine, Evangelista, Hoza, & Kaiser, 2007).

The high vulnerability associated to ADHD justifies the study of the factors that could buffer the negative impact of its core symptoms in children's functioning.

Self-perceptions have a great importance on people's lives. They organize data from the environment affecting experiences' interpretation, influencing emotions and motivation and, therefore, guiding people's behaviors (e.g. Oyserman, 2001; Swann, Chang-Schneider, & Larsen McClarty, 2007).

In recent years, studies that show the strong impact of ADHD children's self-perceptions in their development and psychosocial adjustment have emerged. For example, a positive self-perception of academic competencies in childhood predicts a lower level of internalizing and externalizing problems, less presence of substance abuse, and better therapeutic outcomes in adolescence (Mikami & Hinshaw, 2006). Self-concept is also a significant predictor of life satisfaction in these children (Miranda-Casas, Presentación-Herrero, Colomer-Diago, & Roselló, 2011).

The empirical and systematic study of ADHD children's self-concept is recent and reveals that they tend to overestimate their competence in a greater extent than other children. This tendency has been linked to a positive illusory bias (PIB) in their self-perception. That is, an overestimation of their capabilities that produces a discrepancy between the competencies they report and their actual competencies (Hoza et al., 2004; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; J. S. Owens et al., 2007). However, recent studies show that there is a big proportion of ADHD children with an accurate self-perception (Klimkeit et al., 2006; Molina & Maglio, 2013; Rizzo, Steinhausen, & Drechsler, 2010).

Given the role that positive self-perceptions play in health promotion, the question about their origin in ADHD children arises. On the other hand, ADHD children's PIB has also been associated with

negative outcomes such as behavioral problems (e.g. Hoza, Murray-close, Arnold, & Hinshaw, 2010) and lack of social abilities (e.g. Linnea, Hoza, Tomb, & Kaiser, 2012). These findings show the importance of studying the factors that could reduce the bias.

Although self-knowledge is the result of the interaction of numerous factors (see Swann & Bosson, 2010 for a review), different theoretical perspectives agree that self-concept is socially constructed (Owens, T. J., 2006; Oyserman, Elmore, & Smith, 2012). In this sense, the influence of families and parent-child relationships is central (Harter, 1999).

ADHD biological bases are widely recognized (e.g. Biederman, 2005), but it is important to make progress identifying the psychosocial and contextual factors involved in this disorder. ADHD occurs in a social context in which the relationship with family and, particularly, with the parents has a fundamental role (Roselló, García-Castellar, Tárraga-Mínguez, & Mulas, 2003).

The above poses the question about how parenting style may impact on ADHD children's self-perceptions. To our knowledge, there are few studies that addressed this issue in ADHD children. Results show that affectionate maternal attitudes were a significant predictor of global self-esteem in Korean ADHD children (Oh, Park, Suk, Song, & Im, 2012).

Regarding the origin of PIB in ADHD children, there are four hypotheses: the cognitive immaturity hypothesis, the ignorance of incompetence hypothesis, the anosognosia hypothesis, and the self-protection hypothesis. Up to this moment, it is the latter the one with the greater empirical support. According to this hypothesis, these children show a facade of confidence to others as a way to protect themselves against failure and cope with new challenges (J. S. Owens et al., 2007).

One of the core findings within this hypothesis is that ADHD children can give a more accurate self-evaluation when they receive a positive feedback from their environment. In laboratory studies, it was found that children with ADHD who received positive feedback by research assistants could make a more accurate assessment of their behavior than children who did not receive feedback (Diener & Milich, 1997; Ohan & Johnston, 2002). Also, after a negative interaction with another child, ADHD children overestimated their behavior to a greater extent (Hoza, Waschbusch, Pelham, Molina, & Milich, 2000).

Based on these findings, it is interesting to study the effect of feedback given by parents in uncontrolled interactions. According to this hypothesis, parent-child interactions characterized by warmth and low levels of criticism would be related to a lower PIB in ADHD children because the need to protect their

self-esteem would decrease. Empirical research revealed that criticism from parents was associated with higher PIB in the social domain in children with ADHD, but showed no relation with the bias in the comparison group (Emeh & Mikami, 2012).

There is a need to continue studying how parent-child relationship is linked to the self-perceptions of children affected by this disorder. Particularly, it is important to consider that children's perception of their parents' behavior has as much influence, or even more, on their development than parents' actual behavior (Gracia, Lila, & Musitu Ochoa, 2005).

To our knowledge, no studies have investigated the relation between ADHD children's perception of parenting styles and their self-perceptions (see Molina, 2013 for a review). For this reason, the main question of this research is how ADHD children's perception of parenting style is related to their self-perception.

### 1.1 The current study

The first goal of this study is to explore which aspects of perceived parenting style by ADHD children predict positive self-perceptions in these children. According to the literature on parenting styles and parenting practices, one would expect that children who perceive acceptance and an adequate control (high accepted control and low pathological control or extreme autonomy) from their parents have positive self-perceptions (e.g. Nishikawa, Sundbom, et al., 2010; Reina et al., 2010; Skinner et al., 2005).

However, there is something unique in ADHD children's self-system. They tend to overestimate their competence as a way of self-protection (J. S. Owens et al., 2007). This is why the first goal of this study is exploratory and we did not develop any hypotheses about it. Nonetheless, we can assume that the relation between ADHD children's perception of parenting style and their self-perception could be different than in children without ADHD.

The second goal of this study is to investigate which are the aspects of perceived parenting style by ADHD children that predict a positive illusory bias in their self-perceptions. Based on the recent findings in the study of the self-protection hypothesis, we expect ADHD children to have a positive bias when they perceive a low level of parental acceptance (Hypothesis 1) and an inadequate parental control (low accepted control and high pathological control or extreme autonomy) (Hypothesis 2).

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## 2. METHOD

### 2.1 Type of study

This is a descriptive correlational study with a non-experimental cross-sectional design (Hernández Sampieri, Fernández-Collado, & Baptista Lucio, 2010).

### 2.2 Participants

Participants were 96 boys and girls, from the Metropolitan Area of Buenos Aires (MABA<sup>1</sup>; Argentine) and one of their parents. In Table 1 are presented the socio-demographic characteristics. There were three groups of children as follows: children diagnosed as ADHD (DSM IV criteria) ( $n = 28$ ), children assisting to psychotherapy but did not meet diagnostics criteria for ADHD (Attending Psychotherapy Group, APG;  $n = 24$ ) and children that were not assisting to psychological, psychiatric, or neurological treatment (Not Attending Psychotherapy Group, NPG;  $n = 44$ ).

From the ADHD group, 45.70 % (16) of the children presented an ADHD combined subtype, 42.90 % (15) presented a predominantly inattentive subtype, 2.90 % (1) presented a predominantly hyperactive/impulsive subtype, and 8.60 % (3) presented a not specified subtype. Because of the high level of comorbidity associated to ADHD, children with comorbid disorders were included in this group (Emeh & Mikami, 2012; E. N. Swanson, Owens, & Hinshaw, 2012). A 42.40 % (14) of ADHD children presented at least one comorbid disorder. The most frequent comorbid disorders were: Learning Disorders, Disruptive Behavior Disorders, and Anxiety Disorders. A 30.30 % (10) of ADHD children were taking medication when participated in the study, 90.00% (9) with methylphenidate and a 10.00 % (1) with risperidone.

Amongst the APG, 23.10 % (6) of the children presented a Learning Disorder, 19.20 % (5) a Disruptive Behavior Disorder, 19.20 % (5) an Anxiety Disorder, 7.70 % (2) an Elimination Disorder, and 26.9 % (7) clinical problems that did not constitute a psychiatric disorder (mostly problems associated with school performance). A 15.40 % (4) of these children had at least one comorbid disorder. One of these children was taking psychiatric medication (i.e. sertraline).

### 2.3 Procedure

ADHD and APG children were recruited from three mental health centers from the MABA specialized in children and adolescents' psychological attention. The inclusion criterion for the ADHD group was to have a DSM IV based diagnose. For the APG,

the inclusion criterion was to be in psychological treatment but not to fit the ADHD diagnostics criteria. Children were diagnosed as ADHD and APG by a health professional.

The parents and children from the NPG were contacted in a school from the MABA. Children did not have to assist to any psychological, psychiatric, psychopedagogic or neurological treatment, as informed by the parents and school authorities, to meet the inclusion criteria for this group.

In all cases, informed consent was asked to the parents indicating their acceptance for their children's participation in the study, which was voluntary and confidential. Parents completed the questionnaires independently. Children did so with the assistance of a trained adult (i.e. their therapist or researchers).

**Table 1.** Socio-demographic characteristics of children and their families

	ADHD (n = 28)	APG (n = 24)	APG (n = 44)
<b>Children</b>			
<b>Sex</b>			
<b>Boys (%)</b>	85.7	92.3	70.5
<b>Age</b>			
<b>M (SD)</b>	8.97 (1.56)	9.58 (1.70)	9.55 (1.42)
<b>Father</b>			
<b>Age</b>			
<b>M (SD)</b>	40.50 (6.08)	44.40 (5.29)	43.73 (5.45)
<b>Educational level (%)</b>			
<b>Lower than high school</b>	19.40 (6)	28.00 (7)	15.80 (3)
<b>High school</b>	29.00 (9)	20.00 (5)	25.70 (11)
<b>Higher than high school</b>	51.60 (16)	52.00 (13)	58.40 (30)
<b>Occupation (%)</b>			
<b>Independent professional</b>	29.00 (9)	56.00 (14)	51.20 (22)
<b>Employed</b>	64.50 (20)	40.00 (10)	41.90 (18)
<b>Unemployed</b>	0.00 (0)	4.00 (1)	0.00 (0)
<b>Other</b>	6.50 (2)	0.00 (0)	7.00 (3)
<b>Mother</b>			
<b>Age</b>			
<b>M (SD)</b>	38.85 (6.50)	41.00 (4.86)	40.84 (4.73)
<b>Educational level (%)</b>			
<b>Lower than high school</b>	11.80 (4)	11.50 (3)	2.30 (1)
<b>High school</b>	23.50 (8)	23.10 (6)	13.60 (6)
<b>Higher than high school</b>	64.70 (22)	65.40 (17)	84.10 (36)
<b>Occupation (%)</b>			
<b>Independent professional</b>	29.40 (10)	44.00 (11)	41.90 (18)
<b>Employed</b>	44.10 (15)	36.00 (9)	39.50 (17)
<b>Unemployed</b>	2.90 (1)	4.00 (1)	0.00 (0)
<b>Other</b>	23.50 (8)	16.00 (4)	18.60 (8)
<b>Family</b>			
<b>Parents' marital status (%)</b>			
<b>Married / cohabit</b>	64.70 (22)	80.80 (21)	86.00 (37)
<b>Separated / Divorced</b>	20.60 (7)	15.40 (4)	14.00 (6)
<b>Remarried</b>	14.70 (5)	3.80 (1)	0.00 (0)
<b>Number of people in household</b>			
<b>M (SD)</b>	4.24 (1.09)	4.46 (1.36)	4.11 (0.78)
<b>Family structure (%)</b>			
<b>One parent</b>	11.80 (4)	11.5 (3)	11.40 (5)
<b>Two parents</b>	55.90 (19)	65.40 (17)	77.30 (34)
<b>Extended</b>	5.90 (2)	3.80 (1)	6.80 (3)
<b>Composed</b>	26.50 (9)	19.20 (5)	4.50 (2)

**Note.** ADHD=Attentional Deficit Hyperactivity Disorder; CCG = Clinical Control Group; HCG = Healthy Control Group.

## 2.4 Measures

*Socio-demographic questionnaire.* It was constructed ad hoc to characterize the sample in terms of their socio-demographic characteristics (age, educational level and occupation of parents, family composition) and the history of the child's previous treatments.

*Self-perception Profile for Children (SPPC, Harter, 1985; Adaptación: Molina, Raimundi, López, Cataldi, & Bugallo, 2011).* It is a self-report questionnaire composed by 36 items. It assesses self-concept in five specific domains (academic competence, social acceptance, athletic competence, physical appearance, behavioral conduct) and global self-esteem. Each subscale is composed by six items with a four-point answer scale. Two propositions that reflect two groups of kids with opposed self-perceptions are presented to the children. They have to select which kind of kids they are like and how much they are like them (*Really true for me* or *Sort of true for me*). The original version has good factorial validity and internal consistency (Cronbach alpha from .71 to .86) (Harter, 1985). The adapted version has good factorial, construct, convergent and discriminant validity. Internal consistency is good (Cronbach alpha from .70 to .84) (Molina et al., 2011). In this research we study four subscales because they are the main affected domains in ADHD children. Those subscales have a good internal consistency (Cronbach alpha: academic competence, .82; social acceptance, .75; behavioral conduct, .84; global self-worth, .68).

*Parent's Rating Scale of Child's Actual Behavior (PRS, Harter, 1985; Adaptation: Molina, Calero, & Raimundi, 2013).* It is a self-report questionnaire composed by 15 items that assess parents' perception of their children's characteristics in the same domains assessed by the SPPC. Each subscale is composed by three items with a 4-point answer scale. Parents have to choose between two propositions that describe children with opposed attributes, which one is the best description for their child. Next, they have to answer how much this is true for their child (*Really true* or *Sort of true*). The original version has a good factorial, convergent and discriminant validity (Cole, Gondoli, & Peeke, 1998) and good internal consistency (Cronbach alpha from .82 a .89; Seroczynski, Cole, & Maxwell, 1997). The adapted version also has good factorial, convergent and discriminant validity and good internal consistency (Cronbach alpha from .66 to .87; Molina et al., 2013). The three subscales assessed in the present study have good internal consistency (Cronbach alpha: academic competence .82; social acceptance, .72; behavioral conduct, .88).

*Argentine Scale of Children's Perception of their Relationship with their Parents (Richaud de Minzi, 2007).* It is a self-report questionnaire composed by 32 items with a 3-point answer scale (*always, sometimes, never*) that conform four subscales: acceptance, accepted control, pathological control, extreme autonomy. The scale has a good factorial validity and criteria validity (Richaud de Minzi, 2007). It also has a good to very good internal consistency (Cronbach alpha from .60 to .92 for the mother version and from .60 to .89 for the father version). In this sample internal consistency coefficients were from regular to good (Cronbach alpha: acceptance, .72 for mother and .74 for father; accepted control, .56 for mother and .66 for father; pathological control, .69 for mother and .74 for father; extreme autonomy, .60 for mother and .72 for father).

## 2.5 Data analysis

To research the bias in self-perceptions, we studied the discrepancy between children's self-perceptions and parents' perception of children's attributes. First, we estimate the average scores of children's answers in the specific domains of the SPPC (academic competence, social acceptance and behavioral conduct) and the average scores of parents' answers to the PRS in those domains. Second, we subtracted parents' scores to children's scores in each domain. Positive scores indicate overestimation of skills (positive bias) while negative scores indicate underestimation (negative bias).

The variables under study did not have a normal distribution. For this reason we performed a series of simple logistic binary regressions to study which aspects of the parent-child relationship could better predict high or low self-perceptions. The same type of data analysis was performed to study which aspects of the relationship could better predict a positive or negative bias.

To create a categorical binary variable for children's self-perceptions, we dichotomized children's scores in SPPC's subscales. To do so, we took the full sample's median as a cut-off score. Scores above the median represent a positive self-perception. Scores below the median correspond to a negative self-perception. To create a categorical binary variable for self-concept's bias, we took zero as a theoretical cut-off score because it represents the total absence of discrepancy between parents' and children's perceptions. Scores above zero represent a positive bias. Scores below zero represent a negative bias. We use the Nagelkerke's  $R^2$  to measure each model's effect size (Bewick, Cheek, & Ball, 2005).

We conducted the regressions for each group separately to assess if the effect of children's

perception of parenting style on their self-perceptions differs in each group.

### 3. RESULTS

#### 3.1 The predictive power of perceived parenting style on children's self-perceptions

The logistic regressions significant models for the ADHD group are presented in Table 2. Children's perception of high levels of pathological control by the mother predicted a positive self-perception of academic competence. Model's global predictive power was good. However, it was better predicting a negative self-concept than a positive one. Nagelkerke's  $R^2$  tends to be good.

The perception of ADHD children of high levels of pathological control by the mother also predicted a positive self-perception of behavioral conduct. The model's predictive power was better when the self-concept was negative. Nagelkerke's  $R^2$  tends to be good.

The perception of ADHD children of high levels of extreme autonomy by the father predicted a positive self-esteem. The model's predictive power was low and the predictive power for a negative self-esteem was better than for a positive one. Nagelkerke's  $R^2$  was low. Although the likelihood ratio test is significant ( $p = .039$ ), the Wald statistic only had a marginal significance ( $p = .066$ ). However, different authors point out that this statistic's reliability is questionable, especially for a small sample size. The likelihood ratio test is superior and more robust (e.g. Bewick et al., 2005; Peng, Lee, & Ingersoll, 2002).

In the APG, children's perception of low levels of pathological control by the mother predicted a positive global self-esteem. The model's global predictive power was good. However, the predictive power was better for a negative self-esteem than for a positive one. Nagelkerke's  $R^2$  was low (see Table 3). In this group none of the aspects of children's perception of parenting style predicted their self-concept in specific domains.

In the NPG, children's perception of high levels of acceptance by the mother predicted a positive self-perception of social acceptance. The model predicts correctly more than half of the cases. The predictive power was equal both for positive and for negative self-concept. However Nagelkerke's  $R^2$  was low (see Table 4). On the other hand, children's perception of low levels of pathological control by the mother predicted a positive self-perception in the behavioral conduct domain. The predictive power was good for a positive self-concept but low for a negative one. Nagelkerke's  $R^2$  was low.

#### 3.2 The predictive power of perceived parenting style on the bias in children's self-concept

Table 5 shows the logistic regression significant model for the bias in ADHD children's self-concept. The children's perception of high levels of pathological control by the mother predicted a positive bias in self-perception of academic competencies. The model's predictive power was good for a positive bias but not for a negative one. Nagelkerke's  $R^2$  was low.

In APG, the children's perception of low levels of accepted control by the mother predicted a positive bias in their self-perception of social acceptance. The model's global predictive power was good and equal for positive and negative bias. Nagelkerke's  $R^2$  was good. Also, the children's perception of low levels of pathological control by the mother predicted a positive bias in this domain. However, model's predictive power was lower. Nagelkerke's  $R^2$  was lower too. Moreover, although the likelihood ratio test was significant ( $p = .026$ ), Wald test's significance was marginal ( $p = .065$ ) (see Table 6).

### 4. DISCUSSION

The goal of this study was to identify which are the aspects of the parenting style perceived by ADHD children that predict positive self-perceptions and a positive bias in self-concept.

Results show that ADHD children who perceive high levels of pathological control by their mother are more likely to have a positive self-perception in the academic and behavioral conduct domains. However, in the APG, children who perceive a low pathological control by their mother are more likely to have a positive global self-esteem. In NPG, children who perceive high acceptance by their mother are more likely to have a positive self-perception in the social domain. On the other hand, children who perceive a low pathological control by their mother are more likely to have a positive self-perception in the behavioral conduct domain.

It is important to note that pathological control had a different effect in the APG and the NPG than in the ADHD group. While in the latter a low perceived control was associated with more negative self-perceptions, in the other groups predicted more positive self-perceptions. In this sense, ADHD condition seems to have a moderating effect on the relationship between children's perception of parenting style and their self-perceptions. This agrees with the evidence that there is something particular in ADHD children's self-system and with the self-protection hypothesis. These ideas will be discussed later.

**Table 2.** Simple Logistic regression models for the prediction of ADHD children's perception of parenting style over self-perceptions

Model. DV: Academic competences <sup>a</sup>							
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagelkerke	
x <sup>2</sup>	df	p					
5.16	1	.023*	.17			.23	
Predictive power (%)			Global	Negative SC	Positive SC		
			75.00	88.20	54.50		
Variables in the equation	B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological control	0.28	0.14	4.21	1	.040*	1.33	[1.01, 1.74]
Constant	-5.12	2.33	4.82	1	.028*	0.01	-
Model. DV: Behavioral conduct <sup>a</sup>							
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagelkerke	
x <sup>2</sup>	df	p					
4.64	1	.031*	.15			.23	
Predictive power (%)			Global	Negative SC	Positive SC		
			82.10	95.20	42.90		
Variables in the equation	B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological control	0.29	0.15	3.95	1	.047*	1.33	[1.01, 1.77]
Constant	-6.01	2.60	5.36	1	.021*	0.01	-
Model. DV: Global Self-esteem <sup>b</sup>							
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagelkerke	
x <sup>2</sup>	df	p					
4.24	1	.039*	.15			.20	
Predictive power (%)			Global	Negative SC	Positive SC		
			53.80	75.00	20.00		
Variables in the equatiuon	B	SE	Wald	df	p	OR	95% CI OR
Paternal Extreme Authonomy	0.56	0.33	3.37	1	.066 <sup>†</sup>	1.75	[0.96 – 3.19]
Constant	-4.55	2.32	3.83	1	.050*	0.011	-

**Note.** DV = dependent variable; SC = self-concept; df = degrees of freedom; OR = odd ratios; CI = confidence interval.

<sup>a</sup>n = 28. <sup>b</sup>n = 26.

<sup>†</sup>p < .10. \*p < .05.

Results found in children from APG and NPG are consistent with findings in general population, which show that children's perception of a lack of acceptance, warmth, or affection from the parents and a harsh control is associated to a negative self-perception (e.g. Nishikawa, Sundbom, et al., 2010; Reina et al., 2010; Skinner et al., 2005).

In the present study, ADHD children's perception of parental acceptance did not predict neither the self-perceptions nor the bias in self-concept. This is in contradiction with the findings in a Korean sample which showed that affectionate maternal attitudes were a significant predictor of ADHD children's self-esteem (Oh et al., 2012). It is important to notice that in this study only the mother's

perception was taken into account, while the children's perception was not assessed.

**Table 3.** Simple Logistic regression models for the prediction of APG children's perception of parenting style over self-perceptions

Model. DV: Global self-esteem <sup>a</sup>									
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p							
4.47	1	.034*				.17			
Predictive power (%)			Global	Negative SC		Positive SC			
			75.00	85.70		60.00			
Variables in the equation			B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological control			-0.35	0.19	3.31	1	.069†	0.70	[0.48, 1.03]
Constant			4.41	2.60	2.87	1	.091†	81.92	-

**Note.** DV = dependent variable; SC = self-concept; df = degrees of freedom; OR = odd ratios; CI = confidence interval.  
<sup>a</sup>n = 24.  
 †p < .10. \*p < .05.

**Table 4.** Simple Logistic regression models for the prediction of NPG children's perception of parenting style over self-perceptions

Model. DV: Social acceptance <sup>a</sup>									
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p							
4.35	1	.037*				.09			
Predictive power (%)			Global	Negative SC		Positive SC			
			65.90	61.90		69.60			
Variables in the equation			B	SE	Wald	df	p	OR	95% CI OR
Maternal acceptance			0.29	0.15	3.94	1	.047*	1.34	[1.01, 1.79]
Constant			-5.95	3.06	3.78	1	.052†	0.01	-

  

Model. DV: Behavioral conduct <sup>a</sup>									
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p							
4.33	1	.037*				.09			
Predictive power (%)			Global	Negative SC		Positive SC			
			56.80	23.50		77.80			
Variables in the equation			B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological control			-0.21	0.11	3.79	1	.051†	0.81	[0.66, 1.01]
Constant			3.48	1.60	4.72	1	.030*	32.56	-

**Note.** DV = dependent variable; SC = self-concept; df = degrees of freedom; OR = odd ratios; CI = confidence interval.  
<sup>a</sup>n = 44.  
 †p < .10. \*p < .05

**Table 5.** Simple Logistic regression models for the prediction of ADHD children's perception of parenting style over the self-concept bias

Model. DV: Bias in academic competence self-perception <sup>a</sup>									
Likelihood ratio test			R <sup>2</sup> Cox Snell			R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p							
4.33	1	.038*				.11			
Predictive power (%)			Global	Negative bias		Positive bias			
			62.50	25.00		81.30			
Variables in the equation			B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological Control			0.33	0.19	3.01	1	.083†	1.40	[0.96, 2.03]
Constant			-4.47	2.91	2.36	1	.125	0.01	-

**Note.** DV = dependent variable; df = degrees of freedom; OR = odd ratios; CI = confidence interval.  
<sup>a</sup>n = 24.  
 †p < .10. \*p < .05.



**Table 6.** Simple Logistic regression models for the prediction of APG children's perception of parenting style over the self-concept bias

Model. DV: Bias in social acceptance self-perception <sup>a</sup>								
Likelihood ratio test			R <sup>2</sup> Cox Snell		R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p						
8.29	1	.004**			.31			
Predictive power (%)			Global	Negative bias	Positive bias			
			77.30	72.70	81.80			
Variables in the equation		B	SE	Wald	df	p	OR	95% CI OR
Maternal accepted control		-0.77	0.32	5.60	1	.018*	0.46	[0.25, 0.88]
Constant		10.96	4.68	5.49	1	.019*	57246.91	-
Model. DV: Bias in social acceptance self-perception <sup>a</sup>								
Likelihood ratio test			R <sup>2</sup> Cox Snell		R <sup>2</sup> Nagerlkerke			
x <sup>2</sup>	df	p						
4.96	1	.026*			.20			
Predictive power (%)			Global	Negative bias	Positive bias			
			63.60	63.60	63.60			
Variables in the equation		B	SE	Wald	df	p	OR	95% CI OR
Maternal pathological control		-0.40	0.22	3.41	1	.065 <sup>†</sup>	0.67	[0.44, 1.03]
Constant		5.62	3.06	3.36	1	.067 <sup>†</sup>	274.41	-

Note. DV = dependent variable; df = degrees of freedom; OR = odd ratios; CI = confidence interval.

<sup>a</sup>n = 22.

<sup>†</sup>p < .10. \*p < .05. \*\*p < .01.

One surprising finding from our study is that children's perception of high extreme autonomy by the father predicted a positive self-esteem. This variable is defined as loose discipline and lack of interest (Richaud de Minzi, 2007) and has been linked to negative outcomes such as conflict with friends (Richaud de Minzi, 2006b), loneliness preference and negative self-perception of academic competence (Richaud de Minzi, 2006a). However, other findings showed that the perception of high levels of extreme autonomy by the mother predicted a positive self-view in the physical/social domain (social acceptance, athletic competence, physical appearance) (Molina, Raimundi, & Bugallo, 2014). On the other hand, these results were consistent with recent findings which showed that in Latin-American countries a permissive parenting style is positive (sometimes even more than the authoritative style) for youth's self-perceptions (e.g. Brazil, Martínez et al., 2007; Mexico, Villalobos et al., 2004).

The results related to the self-concept bias showed that ADHD children who perceived a high pathological control by their mother were more likely to have a positive bias in their self-perception of academic competence. These findings showed that there is no evidence for the hypothesis 1, since perceived acceptance did not predict the bias in children's self-concept. However, there is evidence for the hypothesis 2 in the domain of academic competence. As was previously mentioned, perceived

pathological control by the mother predicted a greater positive bias in this domain.

Our findings presented evidence for the hypothesis that the bias in self-perceptions of children with ADHD plays a self-protection role, especially, in the academic domain. Pathological control predicted a positive self-perception and a positive bias in this domain. We found some evidence for the self-protection hypothesis in the behavioral conduct domain too, since pathological control predicted a positive self-perception.

According to this hypothesis, PIB is a way that ADHD children have to cope with the constant experiences of failure they face every day (Owens, J. S et al., 2007), buffering the impact of these experiences and protecting the children's self-esteem (McQuade, Hoza, Waschbusch, Murray-Close, & Owens, 2011). Our findings were consistent with those that showed that in contexts in which the ADHD children feel protected, they do not need to overestimate their self-evaluations (e.g. Emeh & Mikami, 2012; Ohan & Johnston, 2002). Particularly, our findings were in line with those from Emeh and Mikami (2012), which showed that the criticism from the parents predicted a higher PIB in ADHD children. In Emeh and Mikami's research, parent-child uncontrolled laboratory interactions were studied. Our study's contribution is to investigate the perception that the children have of the pattern of relationship with their parents. In the context of a relationship characterized by hostile control, persistent anxiety

instillation, control through guilt and withdrawal of affection, it could be expected that children overestimate their self-perceptions as a defensive reaction to protect themselves.

On the other hand, we did not find evidence for the self-protection hypothesis in the other two groups. In the APG we found that a low accepted control and a low pathological control predicted a positive bias in social acceptance self-perception. However, the accepted control was the one with higher predictive power. This means that children who perceive less control by their mother tended to perceive higher acceptance by their peers than their parents perceive they have. On the contrary, children who perceived more control by their mothers were more likely to underestimate their social acceptance. It is possible that children who are highly controlled by their mother cannot develop the social competencies needed for the interaction with peers and therefore, underestimate their competence.

In the NPG, children's perception of parenting style did not have an effect on the bias in self-perception. This may be because there were very few children with a positive bias in this group. For this reason, we may not be able to identify the aspects of the relationship with parents that are related to this bias.

It is important to note that the perception of parenting style was related to children's self-perception only in some domains and, sometimes, with a low effect size. This is consistent with the complexity of self-perceptions' origin and the multiplicity of factors involved in its constitution. On one hand, beside social factors, other factors, such as the cognitive ones, have an important role in self-perceptions' development (Harter, 1999). On the other hand, social factors are not restricted only to parent-child relationship. Children's relationship with peers and teachers is particularly important in the developmental stage that was considered in this study (see Swann & Bosson, 2010 for a review).

Particularly for children with ADHD, cognitive factors could play a very significant role and its study should be considered in future research. As was mentioned in the introduction, another hypothesis for the PIB is the one of the anosognosia. That is, the PIB is explained by the executive dysfunctions linked to ADHD. These dysfunctions are an obstacle for ADHD children to perceive their mistakes, while they can perceive other people's mistakes (Evangelista, Owens, Golden, & Pelham, 2008; Owens, J. S. et al., 2007). There are evidences that deficits in these functions partially explain the relation between ADHD and PIB (McQuade, Tomb, et al., 2011). However, not all ADHD children have executive dysfunctions (e.g.

Nigg, 2005; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). This raises new questions, such as the relation between parenting styles and the self-perceptions in ADHD children with executive impairments, or if this relation is different when ADHD children do not have executive dysfunctions. The same questions can be hold for the relation between parenting style and PIB.

The clinical implications of this work should be considered. The study of self-perception in ADHD children shows that self-concept and its bias must be taken into account in the treatment of this disorder. Both, for its impact on the child's functioning, and for its effect on the treatment itself, since there is evidence that over-positive self-perceptions are associated with poorer treatment outcomes (Mikami, Calhoun, & Abikoff, 2010).

Some studies examined whether ADHD children's self-perceptions can be modified by providing feedback to the children (Ohan & Johnston, 2002), or asking them to assess themselves as their teacher would do (Hoza, Vaughn, Waschbusch, Murray-Close, & McCabe, 2012). The results showed that PIB can be reduced, at least partially. However, there aren't enough studies that tested interventions to develop a more accurate self-assessment in ADHD children (Hoza et al., 2012). There is only one study that investigated the influence of treatment on the PIB of children with ADHD. The results showed that intensive cognitive behavioral interventions failed to alter this bias (Mikami et al., 2010).

This raises the question of which are the interventions that could reduce the PIB. In this sense, the multimodal treatment for ADHD (e.g. Jensen et al., 2001; Swanson, J. M et al., 2002), that combines a variety of intervention, including parental training for the development of parenting skills, is recommended. One way for parents to help their children to assess more accurately their self-perceptions is to decrease the criticism in parent-child interactions. This could reduce children's self-protection tendency and, in consequence, the positive bias in their self-perceptions (Emeh & Mikami, 2012).

Besides focusing the interventions in modifying parental behavior, our study results showed, particularly, the importance of considering the children's perceptions of parental behavior, especially the relationship with the mother.

The present study has some limitations. First, the sample size is small. Second, it is not a probabilistic sample and is not representative of Argentine ADHD children. Thus, results should be replicated in other samples. Third, there is a low proportion of girls in this sample, so one should be careful when generalizing these results to ADHD girls.

Forth, since the sample size is small we could not consider the effect of comorbidity in the studied relations. Last, the APG was quite heterogeneous. So it is difficult to know how specific disorders or symptoms influence the relations studied. However, it is recognized that ADHD has a heterogeneous presentation (i.e. it has three subtypes of presentation and a very high rate of comorbidity with different disorders). That is why this could be also an advantage since we compared two similarly heterogeneous groups.

In future studies, the group of girls should be bigger. In turn, it is important to extend the ADHD sample to enable the study of the effect of the associated disorders. Also, it would be interesting to replicate this study with children with specific disorders such as learning disorders, anxiety disorders, mood disorders, or other disruptive behavior disorders.

One thing that should be considered in future research is that not all ADHD children have positive biased self-perceptions. For this reason, we recommend to study how children's perception of parenting style predicts their self-perception and its bias in ADHD children with positive bias, accurate self-perceptions, and negative bias, separately.

Finally, it would be interesting to study the relation between parenting style type (authoritative, permissive, authoritarian or negligent) and children's self-perceptions.

Beyond these limitations, this study has the advantage of working with a group of children with ADHD that includes the different subtypes of presentation and different types of comorbidity, so the sample is similar to the population with this disorder usually treated in psychotherapy (Hoza et al., 2010). The operationalization of the PIB is recommended for its conceptual validity (Owens, J. S et al., 2007). The fact of taking the perception of parents as external criterion with which to compare the child's self-perception, has the advantage of having a high ecological validity (Ohan & Johnston, 2011; Owens, J. S et al., 2007). The SPPC and PRS are the most frequently used instruments in international studies for the evaluation of the subject, making it possible to compare the results with studies in other contexts.

This study allowed further insight into the particular way in which children's perception of parenting style is linked to the self-concept of ADHD children. It also provided data for a better understanding of the function of the PIB in these children. Moreover, makes contributions for a better therapeutic treatment for these children, highlighting the importance of assessing the perception that the children have of their parents' behavior.

## 5. ACKNOWLEDGMENTS

We want to thank to the children, parents, therapists, teachers and authorities of the institutions that participated in this study (Private Psychotherapy Center, CPP, Cognitive Therapy for Children and Youth Equipment, ETCI Foundation, Foundation of Clinical Neuropsychology, FNC, and College Alas-Pinitos). Also, we are grateful to Maria Julia Raimundi, Lucia Bugallo, Mariel Gimenez and Yanina Guzman for their help in data collection for this research.

## 6. AUTHOR NOTE

This research was financed by the Argentine National Council of Scientific and Technological Research (CONICET; Res. No 3609/11 Directed by Dra. Schmidt and co-directed by Dra. Leibovich de Figueroa) and the Secretary of Science and Technology of the Buenos Aires University (UBACyT 20020100100052; Directed by Dra. Leibovich de Figueroa and Co-Directed by Dra. Schmidt).

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