

# Assessment of Social Self-perceptions of Acceptance and Enmity in Children with Attention-Deficit/Hyperactivity Disorder

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## Abstract

This study analyzes the self-perceptions of social competence in children with attention-deficit/hyperactivity disorder (ADHD). It compares two groups of participants, children with ADHD ( $N=20$ ) and children without ADHD ( $N=20$ ) ages between 8 and 12 years old. Sociometric questionnaires were completed by two groups of participants and 707 peers, as well as a questionnaire that evaluates children's behavior from parents' and teachers' perspectives. Results indicate that children with ADHD correctly perceive enmity, but incorrectly perceive friendship. Children with ADHD have low rates of positive reciprocity and qualities that indicate friendship differs considerably from the children without ADHD. The children with ADHD have a different profile of social self-perception than children without ADHD, especially regarding recognizing friendship. The results contribute to the understanding of perceptions of elements of peer relationship and friendships with strong ecological validity. This small scale study provides a proof of concept for improving ecological validity in the methods of evaluating social skills and social emotion learning programming for children with ADHD.

## Keywords

ADHD, self-perception, friendship, enmity, acceptance, classroom

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Attention-deficit/hyperactivity disorder (ADHD) is the most common psychiatric disorder in childhood. This disorder has a significant impact on children's psychological development and interferes with social, emotional, and cognitive functioning; affecting their quality of life (Ros & Graziano, 2018). Children with ADHD commonly have difficulties with social relationships. These difficulties include frequent peer rejection (McQuade & Hoza, 2015) and relationship problems with their parents and teachers. Moreover, children with ADHD have high levels of social vulnerability (Seward et al., 2018).

Social skills deficits common in children with ADHD represent an important area of biopsychosocial development, and their difficulties are not only due to their limited social knowledge but also due to a deficit in social behavior and emotion-regulation (Barkley, 2014). Zucchetti et al. (2015) designate that the research focuses on assessing the unilateral view (i.e., acceptance or rejection of peers) for children with ADHD. The present study addresses and knowledge that children with ADHD have regarding the characteristics of friendship and enmity. In this work, it is understood as friendship and enmity, when one student nominates another in a positive or negative way because he wants or does not want to share with the other the socio-emotional context and the academic.

## **Social Self-perceptions of Children with ADHD**

Social self-perceptions are based on interactive experiences and the interpretation of these experiences and a critical factor underlying social functioning. The children with ADHD tend to overestimate their competences and this is known as positive illusory bias (PIB) (Emeh et al., 2018). However, studies comparing children without ADHD to children with ADHD have produced conflicting results. Studies that compare elementary school children with ADHD and without ADHD using a variety of self-report questionnaires result in contradictory results. Yet, Ohan and Johnston (2011) showed that girls with ADHD overestimate their social competence more than girls without this disorder. From self and teacher-report and parents-report scale of social competence and social laboratory task. The hypothesis of overestimation of social competence as a protective factor against the negative effects that arise because of experiences of failure (Evangelista et al., 2008) has received the most empirical support. Thus, a positive self-concept will be maintained despite experiencing failure, and it could protect them from low self-esteem and the possibility of depression (Hoza et al., 2012).

There are discrepancies between adults' perceptions of children's social competence and the social self-perceptions of children without ADHD and children with ADHD. An overestimation of their competence is observed in the academic, social, and behavioral areas when compared to the opinions of parents, teachers, and peers. Thus, Evangelista et al. (2008) showed that children with ADHD, compared to children without ADHD, were able to distinguish between success and failure in a situational video, but they overestimated their social skills compared to the opinions of their teachers.

Nowadays, most of the published studies have addressed PIB, but few studies have analyzed the social reality representation from both criteria, positive perceptions, and negative perceptions by children with ADHD. Other relevant factors for the analysis of the perceived social competence in children are also the accuracy in reciprocal relations knowledge assessment, friendship, and enmity as well as friendship and enmity perception features.

Features of friendship and enmity reciprocity in children with ADHD. One way to measure the friendship quality in children is by examining their reciprocal relationships (e.g., positive and negative reciprocity) with peers. These reciprocity valuations are a strong indicator because the aversion or preference one child can show toward another can be biased by social self-perception. Moreover, Mikami (2010) points to the importance of analyzing friendship reciprocity and distinguishing between the concepts of friendship and acceptance because children can be accepted by their peers and have no friends, and vice versa.

Typically, research on social relationships in children with ADHD focused on their sociometric status, whereas few studies have analyzed their reciprocities (positive and negative). The Multimodal treatment of children with ADHD (MTA Cooperative Group, 1999) found that 56% of children with ADHD had no mutual friends, 33% had one friend, and 9% had two friends, compared to 32% of without ADHD group with no friends, 39% with one friend, and 22% with two friends. Besides the results obtained by Gresham et al. (1998) indicate that 76% of children with ADHD and associated behavior problems in thirdrd grade had no mutual friends, compared to 30% of children without ADHD.

Other aspects of social competence are friendship and enmity features in the social network as described by children. The ability of children to make and keep friends includes a range of social tasks such as initiating social interaction, being nice, expressing their ideas with care and caution, helping a friend in trouble, being able to forgive a friend even though you have been hurt, and managing conflict (Rose & Asher, 2004). Children with ADHD have fewer friends in comparison to children without ADHD and friendships are often short lived (Marton et al., 2015). Children with ADHD when interacting with dyadic friends who participate in less cooperative games, show less company, and show less sensitivity toward friends whose comparison is characterized by a minor intimacy, reciprocity and satisfaction with the relationship (Normand et al., 2019). Social isolation, being bullied or being the bully, hostile, and aggressive toward others is a constant (Barkley, 2006).

Children with ADHD reported more negative features and the absence of positive features in their friendships (Heiman, 2005). Specifically, 15% of children with ADHD, compared to 45% of those without ADHD, reported that their friendships were characterized by emotional support. Furthermore, Normand et al. (2011) suggested that children with ADHD are less satisfied with their friends and perceive fewer positive features and more negative features in their relationships.

This paper addresses on the following research objectives: the first is to identify perceived social illusory bias in children with ADHD based on the assessments made by these children and their peers, parents, and teachers. The second objective is to

analyze the positive and negative peer reciprocity of children with ADHD compared to children without this disorder. Finally, the third objective is to compare children with and without ADHD concerning the children's friendship values.

Based on prior research in children with and without ADHD, we hypothesize that children with ADHD will have overestimated their social competence and that children with ADHD will have fewer positive reciprocal and more negative reciprocal relationships compared to children without ADHD. Finally, we also hypothesize that the profile of the perception of attributes to describe friendship and enmity is different in children with ADHD compared to children without ADHD.

## Method

### Participants

Participants were 40 Spanish children between 8 and 12 years of age. One group was composed by twenty children with a clinical diagnosis of combined type ADHD (16 boys and 4 girls), and their parents, teachers, and 406 whose classmates attended 19 different classrooms from different schools.

The participants with ADHD had received a clinical diagnosis in psychiatry and neuropsychiatry services of hospitals and medical centers and school psychopedagogical services. In order to confirm the diagnosis, the parents filled out the list of 18 criteria for ADHD according to the DSM-IV-TR (American Psychiatric Association [APA], 2000), assessing the severity of each item from 0 to 3. The presence of at least six inattention symptoms and/or six other Hyperactivity/impulsivity symptoms, persistence of the symptoms for at least on 6 month and clear interference in their daily life functioning.

The group of children without ADHD was composed of 20 children (14 boys and 6 girls). They did not present a record of psychopathologies, according to information facilitated by the school and the parents, and they did not meet the DSM-IV-TR criteria for ADHD. Their parents, teachers, 301 classmates who attended 11 different classrooms from different public schools. The mean age of the children in total was ( $M=9.75$ ,  $SD=1.27$ ), in the IQ ( $M=95.95$ ,  $SD=9.82$ ). The mean age of the children with ADHD was 9.70 years, and the mean age of the children without ADHD children was 9.80 years. No differences between the groups in age ( $t_{(38)}=0.245$ ,  $p=.808$ ), level of schooling ( $t_{(38)}=-0.138$ ,  $p=.891$ ), full-scale IQ ( $t_{(38)}=0.132$ ,  $p=.896$ ), or gender ( $\chi^2_{(2)}=.143$ ,  $p=.705$ ). The questionnaires were filled by 21, 28% of fathers and 78, 72% of mothers, as well as in children with ADHD as in children without ADHD, ( $\chi^2_{(2)}=2.021$ ,  $p=.155$ ).

The inclusion criteria for children with ADHD were based on those used by Ohan and Johnston (2007) described below: the children (a) had been previously diagnosed with ADHD after a comprehensive evaluation by a healthcare professional, and copies of these reports were provided to the study team; (b) the parents confirmed that the child currently met diagnostic criteria for ADHD-C (Combined type ADHD), as specified in the DSM-IV-TR (APA, 2000); (c) the children had a full-scale IQ score of 75

or more as estimated by the Vocabulary and Block Design subtests (see Sattler, 1982) on the Spanish version of the Wechsler Intelligence Scale for Children 3rd edition-Revised (WISC-III-R; Wechsler, 1993); and (d) the children had an absence of psychosis, neurological damage, or sensory or motor deficits, as reported by parents. The teachers' ratings were not used to confirm the ADHD diagnosis because most of the children in our ADHD sample were taking medication during the school day, so their teachers were unable to report on no medicated behavior. Indeed, 75% of the ADHD samples were medicated with stimulant preparations; the remainders were not medicated.

The inclusion criteria for the without ADHD children were as follows: the children needed to (a) be free of any psychological disorder, including but not limited to ADHD, as reported by school personnel; (b) display normal academic progress as reported by school personnel; and (c) have an estimated full-scale IQ of at least 75, as estimated by the Vocabulary and Block Design subtests (see Sattler, 1982) on the Spanish version of the Wechsler Intelligence Scale for Children 3rd edition-Revised (WISC-III-R; Wechsler, 1993)

### *Procedure*

School psychopedagogical services consist of psychologists who are responsible for assessing and diagnosing children with possible behavioral and learning difficulties at school. These sources provided an initial sample of 30 children with ADHD-C diagnoses. Of these 30 children with ADHD, 8 did not meet all the study inclusion criteria, and 2 other children changed schools before the data collection, leaving a final sample of 20 children with ADHD. For the without ADHD sample, participants were recruited with assistance from 13 public schools in the zone where the study took place. Initially, voluntary participation was requested from the families for children who were in the same age range as the children with ADHD and who did not have a diagnosis on record for any psychological or learning problem. From a total of 50 volunteer families, 23 children were chosen randomly by the research team, but there was also a reduction because 3 children moved out of at home; finally, there were 20 children in the without ADHD group.

All the children (ADHD and without ADHD) and their classmates completed the sociometric test in an evaluation session requiring 30 to 40 minutes during school hours. Also, the intelligence assessment was administered in individual soundproof testing rooms with the examiner, with each session requiring approximately 10 minutes.

### *Measures*

*Self-perception and social perception of peers.* We applied the sociometric questionnaire included in the Sociomet software (González & García-Bacete, 2010). This instrument consists of four questions based on friendship criteria, analyzing their positive and negative dimensions as well as affective and cognitive dimensions. Thus, children

nominate (maximum three) children in the class and provide the reasons for each nomination. The order of the nominations is also important in this instrument. The nominations were collected for 747 children and were registered in Sociomet.

To accomplish part of the first objective and compare the ADHD children's perceptions with those of their peers, we considered the following variables in the Sociomet software:

- (a) Index of positive impressions. Reports the percentage of peers who have a positive image of the child.
- (b) Index of negative impressions. Indicates the percentage of peers who have a negative image of the child.
- (c) Positive perceptions. Measures the child's expectations about possible positive nominations by their peers.
- (d) Negative perceptions. Measures the child's expectations about negative nominations by their peers.
- (e) False perceptions. Misperceptions made by the child, both positive and negative.
- (f) Index of positive perceptual realism. The successful proportion of positive perceptions about the total issued.
- (g) Index of negative perceptual realism. The successful proportion of negative perceptions about the total issued.

*Social perceptions of parents and teachers.* To implement the second part of the first objective, we applied two scales of the Strengths and Difficulties Questionnaire SDQ-Cas (Goodman, 2005). This questionnaire evaluates the children's behavior from the parents' and teachers' perspectives. The version for parents and teachers' was applied in the present study and we used only two scales that measure children's behavior in the relationships (i.e., prosocial behavior and peer problems). Each scale consists of five items and each item is rated as Not true (0), Somewhat true (1), or Certainly true (2). The total score that can be obtained on each scale ranges from 0 to 10. For example, the peer problems subscale was selected, which includes items that ask about behaviors that show adaptation in the group of peers ("He is pretty solitary and would rather play alone"). High scores indicate problems with peers whereas the prosocial subscale provides a reverse score where higher scores indicate more prosocial behaviors ("Helpful if someone is hurt, upset, or feeling ill"). The SDQ has shown good statistical and psychometric properties in the Spanish population (Rodríguez-Hernández et al., 2012), with reliability indexes in Peer Problems Scale (0.64) and Prosocial Scale (0.83) for teachers and in Peer Problems Scale (0.58) and Prosocial Scale (0.69) for parents. It obtained also acceptable to high internal consistency in the current study (Cronbach's  $\alpha = .74-.80$  between subscales).

*Reciprocities.* To implement the second objective and evaluate the reciprocities, we used the last two questions on the questionnaire included in the Sociomet software (González & García-Bacete, 2010). We also considered the indexes of positive

**Table 1.** Categories of Acceptance and Reasons for Acceptance (Adapt to Monjas et al., 2008).

Categories of acceptance	Examples of reasons for acceptance
Friendship	He/she is my best friend, understands me, He/she is sincere. . .
Fellowship	He/she is a good peer, helps me a lot, share things. . .
Be liked by	I like him/her, I like to be with him/ her, . . .
Physical characteristics	He/she is beautiful, . . .
Friendliness	He/she is very kind with me
Good mood and behavior	He/she is good person, never gets angry. . .
School Competition	He/she is very smart, he/she is studious. . .
Commonality	We do home work together
Fun	I laugh a lot with him, he is cheerful. . .
Others	I don't know, . . .
No response	

reciprocity (i.e., indicator of friendship between two students), and negative reciprocity (i.e., indicator enmity between two students) from the Sociomet software. Thus, the positive reciprocity value is the number of reciprocities of friends of a student in your class and the negative reciprocity value is the number of reciprocities of enmities of a student in your class.

*Features of friendship and enmity perception.* For this evaluation, we took into account the children's three answers to the question of why? In the third (i.e., Who do you think likes you?) and fourth (i.e., Who do you think does not like you?) questions on the Sociomet software questionnaire (González & García-Bacete, 2010).

A frequency analysis of the children's answers to the question of what they think of the features of best friend and enmity was carried out using the list of reasons of the categories of acceptance and reasons for acceptance (Table 1) and categories of enmity (Table 2) used by Monjas et al. (2008). Thus, to calculate interrater reliability, the answers were transcribed and coded independently, anonymously, and with no knowledge of the diagnosis by two professional psychologists who had previously attended a seminar about the coding method. The kappa coefficient for the categories of friendship perception in the first friendship is 0.960, for the second one 0.899, and the third 0.938. Likewise, the kappa coefficient for the categories of enmity perception is 1 for the first one, 0.912 for the second, and 0.943 for the third.

## Results

The data were analyzed using SPSS (Version 21.0). The Shapiro–Wilk test (S–W) was applied to all the study variables to verify that the data distribution met the statistical normality criterion (Shapiro–Wilk  $p$ -values  $>.05$ )



**Table 2.** Categories of Enmity in Children and Reasons for Enmity (Adapt to Monjas et al., 2008).

Categories of enmity	Examples of reasons for enmity
Unfriendliness	She/he isn't my friend, He/she is liar. . .
Bad peer	He/she doesn't leave you things, He/she has envy
I dislike	I don't like, I don't like her at all. . .
Physical characteristics	He/she's ugly, he/she's fat, I don't like his face
Antipathy	He/she is not a nice person, He/she is unfriendly
Bad character	He/she doesn't accept jokes.
Poor academic skills	He/she doesn't do homework
Bored, withdrawn	He/she's not funny. He/she does not speak
Silly, baby	He/she is silly
Heavy/upset	He/she doesn't stop talking, He/she takes my things
Gestural and verbal aggression	He/she says swear words, He/she makes fun of me . . .
Domination and superiority	He/she is a commander, He/she does not let others speak.
Physical aggression	He/she pushes us, He/she looks for fight.
Vandalism	He/she's a thug, He/she destroys things.
Lack of relationship	He/she does not come with me
Others	I don't know, . . .
No response	

Subsequently, independent-samples *t*-test (variables normal distribution) and *U* Mann–Whitney (showed no normal distribution) comparisons were also applied. Specifically, the S–W test (age)  $p = .081$  for the without ADHD group and  $p = .085$  for the ADHD group; the S–W (level of schooling)  $p = .153$  for the without ADHD group and  $p = .274$  for the ADHD group; the S–W (IQ)  $p = .687$  for the without ADHD group and  $p = .204$  for the ADHD group. The Shapiro–Wilk test for the other variables is in Table 3.

The effect size for the ADHD group vs. the without ADHD group was computed using Cohen's *d* or Rosenthal's *r* (Rosenthal, 1991). Effect sizes for ADHD versus comparison groups were computed using Cohen's *d* and interpreted on the following metric: small=0.2; medium=0.5; large=0.8 (Cohen, 1988) and for interpreting Rosenthal's *r* is the same as those for Cohen's *d* (Rosenthal, 1991). For the analyses between groups concerning categorical variables, we used the chi-square test. The criterion for statistical significance was set at 5%.

### Exploratory Analyses

Table 3 presents data for the children ADHD and the without ADHD group regarding the first objective variables. There are significant differences between the groups regarding the peers who have a positive image of the child and positive perceptual



**Table 3.** Social Self-Perception Variables in ADHD and Without ADHD.

Variable	ADHD (N=20)		Without ADHD (N=20)		SW	<sup>a</sup> Effect size (d) (r)	t/U
	M (SD)	Mdn (IQR)	M (SD)	Mdn (IQR)			
Index of positive impressions	10.4 (8.25)	–	16.7 (9.1)	17.5 (11)	ADHD, $p = .278$ W_ADHD, $p = .151$	$d = -0.72$	T (38) = -2.292*
Index of negative impressions	24.2 (20.83)	20.5 (36)	17.85 (22.97)	9.5 (17)	ADHD, $p = .000$ W_ADHD, $p = .069$	$r = .15$	U (40) = 155.5 <sup>ns</sup>
Positive perceptions	2.6 (0.883)	3 (0)	2.7 (0.801)	3 (0)	ADHD, $p = .000$ W_ADHD, $p = .000$	$r = .03$	U (40) = 190 <sup>ns</sup>
Negative perceptions	2.6 (0.995)	3 (0)	2.75 (0.786)	3 (0)	ADHD, $p = .000$ W_ADHD, $p = .000$	$r = .03$	U (40) = 189.5 <sup>ns</sup>
False Perceptions	3.25 (1.552)	3.5 (2)	3.3 (1.6)	3 (1)	ADHD, $p = .038$ W_ADHD, $p = .441$	$r = .07$	U (40) = 198.5 <sup>ns</sup>
Index positive perceptual realism	20 (31.4)	0 (33)	64.6 (36.13)	67 (67)	ADHD, $p = .001$ W_ADHD, $p = .000$	$r = .28$	U (40) = 71**
Index negative perceptual realism	60.05 (38.44)	67 (37)	18.3 (29.59)	0 (33)	ADHD, $p = .000$ W_ADHD, $p = .003$	$r = .25$	U (40) = 84.5**

Note. ADHD=Attention-deficit/hyperactivity disorder; W\_ADHD=without attention-deficit/hyperactivity disorder; SW=Shapiro-Wilk  $p$ -values.

\* $p < .05$ ; \*\* $p < .01$ ; Values in table are raw score means with standard deviations in parentheses, if you follow a normal Distribution, and as medium range (IQR) interquartile otherwise.

<sup>ns</sup>Non-significant

<sup>a</sup>Effect sizes: Cohen's  $d$  for continuous variables, odds ratios for categorical variables Rosenthal,  $r$ .

Student's  $t$ .

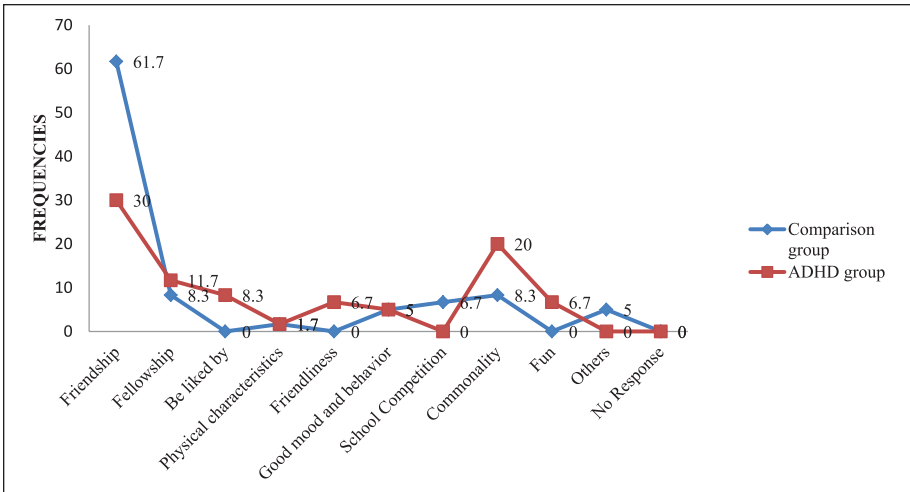
Mann-Whitney  $U$ .

realism (i.e., successful positive perceptions), without ADHD children recognize the positive impressions more accurately than their peers with ADHD. On the other hand, this table also shows significant differences between the groups on the self-evaluation of negative perceptual realism (i.e., successful negative perceptions) where children in the ADHD group recognize the negative impressions better than their peers without ADHD.

Prior to comparison analyses, the S–W test (perceptions parents-prosocial behavior)  $p = .026$  for the ADHD group and  $p = .033$  for the without ADHD group; the S–W test (perceptions teachers-prosocial behavior)  $p = .007$  for the ADHD group and  $p = .114$  for the without ADHD group. The S–W test (perceptions parents-peer problems)  $p = .037$  for the ADHD group and  $p = .063$  for the without ADHD group; the S–W test (perceptions teachers-peer problems)  $p = .042$  for the ADHD group and  $p = .280$  for the without ADHD group. The exploratory results indicate that there are no significant differences between parents' perceptions  $U = 181.5$ ,  $p = .62$ ,  $r = -0.08$  (ADHD:  $M = 7.8$ ,  $SD = 2.04$ ; without ADHD:  $M = 8.05$ ,  $SD = 2.01$ ), and teachers' perceptions  $U = 165$ ,  $p = .35$ ,  $r = -0.14$  (ADHD:  $M = 6.35$ ,  $SD = 2.90$ ; without ADHD:  $M = 7.20$ ,  $SD = 2.37$ ), of prosocial behavior between the two groups. No significant differences were observed in the perceptions of parents  $U = 193.5$ ,  $p = .86$ ,  $r = -0.02$  (ADHD:  $M = 2.50$ ,  $SD = 2.14$ ; without ADHD:  $M = 2.55$ ,  $SD = 2.06$ ); and teachers  $U = 153$ ,  $p = .21$ ,  $r = -0.2$  (ADHD:  $M = 3.80$ ,  $SD = 2.56$ ; without ADHD:  $M = 2.75$ ,  $SD = 2.35$ ), in their ratings of peer problems between the two groups.

Regarding the second objective, which is to assess the friendship and enmity reciprocity in children with ADHD compared to the without ADHD group, we consider the ratings of 426 children who made up the 19 classrooms in the ADHD group of children. The reciprocity assessments of 321 children from the 11 classrooms that made up the group of selected non-ADHD children are also considered. In both groups, friendship and rejected reciprocity based on three types of possible nominations. Of all the participants with ADHD ( $N = 20$ ), 40% ( $N = 8$ ) had positive reciprocities; specifically, three children with ADHD had three mutual friends, three children with ADHD had two mutual friends, and two children with ADHD had one mutual friend. Thus, 12 participants with ADHD (60%) ( $N = 12$ ) did not receive any positive reciprocity. However, of the 321 students who valued the friendships and rejected selected non-ADHD children from their peers, the 85% ( $N = 17$ ) of the participants had mutual friends. Specifically, five participants had three mutual friends, eight had two mutual friends, and four children without ADHD had one mutual friend. Only 15% of the without ADHD children had no mutual friends. The analysis of the index of positive reciprocity (i.e., percentage of friendships a student has) indicates that there are significant differences between children with ADHD and the without ADHD  $t_{(38)} = 2.06$ ,  $p = .04$ ,  $d = 0.6$  with the without ADHD group ( $M = 8.30$ ) had a much higher meaning than the group with ADHD ( $M = 4.75$ ).

In the case of negative reciprocities, in the ADHD group, 85% ( $N = 17$ ) showed negative reciprocities, and only 15% did not show any. Specifically, five had three mutual enmities, five participants had two mutual enmities, and seven participants had one mutual enmity. For the without ADHD group, only 30% of the participants ( $N = 6$ )



**Figure 1.** Frequencies in the categories of acceptance in the group with ADHD and comparison group.

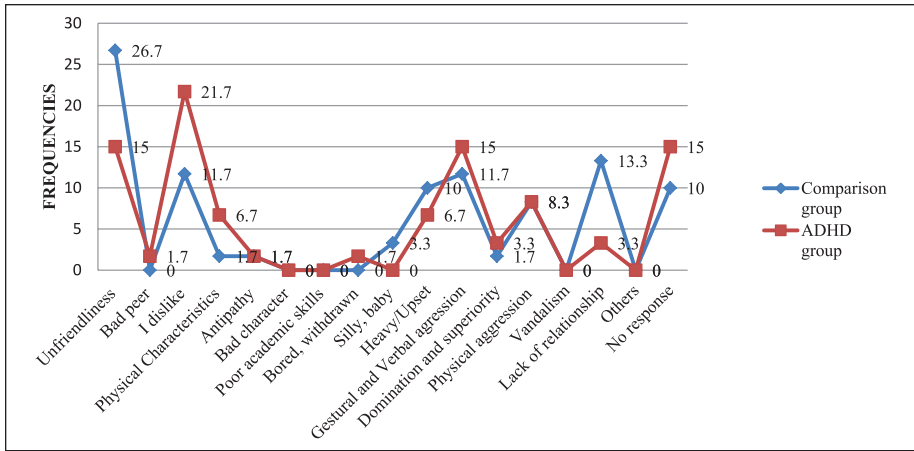
had negative reciprocities, specifically, three participants had two negative reciprocities, and three participants had one negative reciprocity. The analysis of the index of negative reciprocity (i.e., percentage of enmities a student has) revealed significant differences between the children with ADHD and the without ADHD group  $t_{(38)} = -3.46$ ,  $p = .002$ ,  $d = 1$ ; the group of participants with ADHD ( $M = 8.05$ ) had a much higher average than the without ADHD group ( $M = 2.25$ ).

Finally, the third objective attempts to assess the features of friendship and enmity between children with and without ADHD. A chi-square test was performed for each friendship and enmity feature. There were significant differences between the groups with regard to categories of acceptance: friendship ( $\chi^2 [1, N = 120] = 12.11$ ,  $p < .001$ ,  $r = 0.3$ ), friendliness ( $\chi^2 [1, N = 120] = 5.21$ ,  $p < .05$ ,  $r = 0.5$ ), school competition ( $\chi^2 [1, N = 120] = 4.13$ ,  $p < .05$ ,  $r = 0.2$ ) and fun ( $\chi^2 [1, N = 120] = 4.13$ ,  $p < .05$ ,  $r = 0.2$ ). Specifically, the without ADHD group values feature of friendship acceptance: friendship, and school competition categories much more than ADHD. The ADHD group values the categories friendliness and fun, more than the ones without ADHD.

The enmity categories, there were only significant differences between the groups concerning in the categories of lack of relationship ( $\chi^2 [1, N = 120] = 3.92$ ,  $p < .05$ ,  $r = 0.1$ ), being the without ADHD group that shows more frequency in this category (see Figures 1 and 2).

## Discussion

Regarding the first objective of our study, in which we analyze the social illusory bias of children with ADHD we find that children with ADHD have a more negative image



**Figure 2.** Frequencies in the categories of enmity in group with ADHD and group comparison.

than the children without ADHD and also have a lower level of accuracy of positive perceptions compared to the children in the group without ADHD. Although the child’s expectations about possible positive nominations by their peers are similar between both groups, results indicate that children ADHD are not able to recognize which classmates have an affinity with them or which classmates consider them a friend.

Children with ADHD have a higher level of accuracy on negative perceptions than children in the without ADHD group. We could say the children with ADHD have underestimated their social competence because they have an incorrect assessment of their friendships, and yet, they have good accuracy in their perception of their enmity. Although the parents and teachers similarly perceive both groups in the evaluation of prosocial behaviors as in the evaluation of problems with peers, children with ADHD may have difficulty understanding implicit and explicit rules of positive social interactions (Caillies et al., 2014).

The second objective of our study aims to analyze the reciprocity of children with ADHD. Analyses of mutual friends indicate that children with ADHD have a significantly lower rate of positive reciprocity than children in the without ADHD group. The results show that only 40% of children with ADHD, compared to 85% of those without ADHD, have mutual friends. These results agree with those found in the MTA (MTA Cooperative Group, 1999) study, which revealed that over 50% of children with ADHD had no mutual friends. Besides, children with ADHD have a significantly higher rate of negative reciprocity than children in the without ADHD group, as 85% of the children with ADHD have negative reciprocity, compared to 30% of the without ADHD group.

Finally, were explored the differences between children with ADHD and without ADHD children regarding the reasons for acceptance and enmity. The results show

that the without ADHD group tends to value characteristics of acceptance friendship as the principal category, which is understood as being good friends or having characteristics of a true friendship, whereas children with ADHD indicate aspects of friendliness and fun as acceptance features; therefore, they believe that friends accept them because they share hobbies, enjoy the relationship, have fun with them. Yet, as Gardner and Gerdes (2015) noted, children with ADHD give less importance to intimacy and emotional support in their friendships than children without ADHD. Valuing the reasons for acceptance differently may create conflict within the relationships. Furthermore, in our investigation, children with ADHD are not able to recognize which classmates have an affinity with them or which classmates consider them a friend, possibly because they are unable to perceive the positive social signals (an important element in social information processing) or because they have few positive social relationships and that can hinder the positive social learning. Regardless, these factors can interfere with the generic strategies of social approach strategies, such as empathy, understanding emotions, or solving interpersonal dilemmas.

A similar profile is found between the two groups regarding describing features of enmity. Except for the fact that the without ADHD group mainly indicated enmity features such as the “lack of relationship,” possibly there are not so many differences between the two groups in the ADHD children’s social enmity categories because the social interactions are characterized by being negative and conflictive; hence they are capable of perceiving negative social relationships correctly. The assessments of children with ADHD must include a careful examination of their social functioning with particular attention devoted to the reasons for their friendships (Rokeach & Wiener, 2017).

The most important limitation of this study was the small sample with significant efforts to recruit ADHD-C. Although with estimates of the size of the moderate effect (Rosenthal,  $r$ ) at the  $p = .01$  level ( $r = 0.25-0.28$ ) and (Cohen’s  $d$ ) at the  $p = .05$  level ( $d = 0.72$ ). On the one hand, a clinical sample of ADHD was not evaluated, and the social competence in children from clinical samples is not comparable to community samples. We cannot generalize the results to children with ADHD inattentive subtype and ADHD hyperactive/impulsive subtype either because the profile of social competence may be different from that of the combined subtype. Another limitation is the application of limited nomination approach because there is always a danger that children with special needs (in this case ADHD) in each sample will be ignored (Avramidis et al., 2017). The questionnaire used for parents values the child’s behavior in a different context from the one in class; nevertheless, this limitation is overcome with the teachers’ evaluation which takes into account the child’s behavior in the school context.

The exact social perceptions and friends are crucial indicators of children’s social competence and are a critical dimension of adolescent development. An inadequate self-perception of acceptance bias and inappropriate friendship reasons limit the ability of children with ADHD to assess the positive aspects of social relationships, which may conflict with those valued by their peers and lead to a decreasing likelihood of developing mutually. Besides, negative self-perceptions can hinder the

identification of positive qualities in ourselves and others, affecting our self-concept, and self-esteem.

## Implications

This study represents a step forward in the research on the social relations of children with ADHD by looking beyond self-perceptions and the dyadic paradigm and examining multiple influences (parents, teachers, and peers) or multi-informant assessment. The assessment of the social perceptions of children with ADHD in the classroom reveals an underestimation of positive social perception and realistic negative social perception. Thus, children with ADHD have a negative illusory bias when compared to their peers. School psychologists should evaluate these divergent in children with ADHD and provide good practice recommendations to teachers (see Bacete et al., 2013). Besides, the analyses have provided evidence that children with ADHD have low friendship reciprocity and worse quality. They define the acceptance reasons in a manner less likely to maintain friendships than the children in the without ADHD group. The use of sociometric methods provides a viable mechanism for evaluating the effectiveness of some domains of social skills training and social and emotional learning curriculum. The results of this small-scale study are also productive by assisting in targeting of specific curriculum targets for social skills training and social emotional learning for children with ADHD.

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## Data Availability Statement

Research data of this article are available in <http://dx.doi.org/10.6035/PSI.2019.04> in restricted access, as it contains sensitive data. García-Castellar, R., Sánchez-Chiva, D., Jara-Jiménez, P. y

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