

# Relationship between sociometric type and self-attributions for academic failure in a Spanish sample from secondary education

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## Abstract

**Introduction.** The aim of this study was to analyze the relationship between sociometric types, behavioral categories and self-attributions for academic failure (*Ability, Effort* or *External Causes*) in *Reading, Mathematics* and *General*.

**Method.** The total sample was composed of 1349 Spanish adolescents between the ages of 12 and 16 years. Sociometric student identification was obtained using the *Socio* program, and the *Sydney Attribution Scale* (SAS; Marsh, 1984) was administered analyzing academic self-attributions.

**Results.** Results show that students with negative peer nominations obtained significantly higher scores in attributing failure to *Ability* and *Effort* in *Reading, Mathematics* and *General* than students nominated positively by their peers.

**Discussion and conclusions.** Sociometric types were a significant predictor of self-attributions for academic failure, given that students who received negative peer nominations were more likely to attribute academic failure to internal causes like *Ability* and *Effort* than were those with positive nominations.

**Keywords:** adolescence, sociometric types, academic self-attributions, secondary education.

## Resumen

**Introducción.** El objetivo de este estudio fue analizar la relación entre tipos sociométricos, categorías conductuales y la autoatribución académica del fracaso (a la *Capacidad*, al *Esfuerzo* o a *Causas Externas*), en *Lectura*, en *Matemáticas* y en *General*.

**Método.** La muestra fue 1349 adolescentes españoles de 12 a 16 años. La identificación sociométrica de los estudiantes se realizó mediante el *Programa Socio* y para el análisis de las autoatribuciones académicas se administró la *Escala de Atribución de Sydney* (*Sydney Attribution Scale* (SAS)).

**Resultados.** Los resultados muestran que los estudiantes nominados negativamente por sus compañeros obtuvieron puntuaciones significativamente más altas en la autoatribución del fracaso en *Lectura*, *Matemáticas* y en *General* a la *Capacidad* y al *Esfuerzo* que los estudiantes nominados positivamente por sus compañeros.

**Discusión y conclusiones.** Los tipos sociométricos resultaron un predictor significativo de las autoatribuciones académicas del fracaso, ya que los estudiantes nominados negativamente por sus compañeros presentaron mayor probabilidad de atribuir el fracaso académico a causas internas como la *Capacidad* y el *Esfuerzo* que los nominados positivamente.

**Palabras Clave:** adolescencia, tipos sociométricos, autoatribuciones académicas, educación secundaria.

## Introduction

The importance of the peer group in the socialization process is undeniable (Coronel, Levin & Mejail, 2011). Within this socialization process, entry into secondary school is marked by the appearance of new rules, new manners and new meeting spaces (Díaz-Aguado, 2005).

Sociometric status is often considered a reflection of a child's or adolescent's social competency, understood as the capacity to successfully participate in interactions, relationships and groups (Rubin, Bukowski & Parker, 2006). Sociometric techniques make it possible to assess relations between peers, quickly and with high validity, and thereby obtain information about each subject's level of adaptation and about their developmental contexts (Martínez-Arias, Martín & Díaz-Aguado, 2009). Inglés, Delgado, García-Fernández, Ruiz-Esteban and Díaz-Herrero (2010) analyzed the relationship between social interaction styles (aggressivity, prosociability and social anxiety) and sociometric types (preferred, rejected and neglected). The results revealed that prosocial students were proportionally more chosen by their classmates as preferred; aggressive students were the most rejected by their classmates; and students identified with social anxiety were the least preferred among their classmates, and moreover, were more rejected and neglected than the prosocial students.

Secondary education is an important stage in the life cycle of all students, when adolescents must decide whether they wish to pursue further studies or redirect their path toward the work world. In this situation, a knowledge of the causes of students' academic attributions at this stage may be beneficial for helping guide them in their choice of future vocation (Bain & Allin, 2005).

### *Sociometric types and academic self-attributions*

Popularity and sociometric status in the peer group have been studied in relation to psychosocial adjustment (Garaigordobil, 2006), scholastic adjustment (Martín, 2011) and academic attributions. Most of this research focuses on the way that students interpret the rejection they may be suffering, and the causality attributions that they make about their situation. For example, Muñoz, Trianes and Jiménez (1994) suggest that social rejection (in terms of a low sociometric status) brings about a negative social self-concept that the subject attributes

to internal causes which are stable and uncontrollable on his or her part (lack of skills, or ability, or antipathy). This type of attribution generates future expectations of failure in relations with others, with subsequent repercussions on school outcomes.

Jiménez (2003) used a multiple perspective to examine the differences in self- and other-assessed variables of different sociometric groups (popular, rejected, controversial and average) in a sample of 443 primary school students, who filled out sociometric questionnaires on self-concept, locus of control and social anxiety-avoidance. The results showed that popular children were characterized by a positive, prosocial pattern, and the rejected children by a pattern of negative and aggressive-unruly behavior. Regarding their attributions about interpersonal relations, there were no differences between the groups in internalizing or controllability towards social successes and failures. As expected, the rejected students had lower scores than the other groups, but no statistically significant differences were found.

Research by Zhao and Su (2005) focused on studying interpretations of social rejection situations in 376 adolescents. They concluded that the way adolescents who are rejected by their peers interpret the behavior of others is related to degree of social acceptance, in other words, they make different attributions if they compare themselves to other students who are also rejected, or to the popular students.

If we focus on academic self-attributions, we find that secondary students' basic attributional styles or patterns of academic achievement are an exponent and very important indicator when one looks for a causal explanation for students' study process, learning and achievement. Several factors intervene, for one, motivation toward high achievement or scholastic success is maintained or increased when subjects attribute their success or academic achievement to internal factors (Ability and Effort), especially to stable factors (Ability), but also unstable factors (Effort), to a lesser degree. The important fact to stress here is that this type of attribution produces feelings of self-confidence and self-esteem in the subject, feelings of positive value and of satisfaction toward one's self, which directly influence self-concept and social competency. All of this results in and determines a positive effect on achievement motivation and learning motivation (Hayamizu & Weiner, 1991).

Jiayan Pan's 2002 study analyzed the relationship between social status, personality and causal attribution styles in a sample of 527 secondary students in China. Results showed how attributional style and personality traits influenced secondary students' social status, concluding that rejected students show significant differences in attributing academic success to external causes.

### *The present study*

Although prior empirical evidence has shown a certain parallelism between different cognitive-motivational variables involved in academic and social domains (for example, academic self-attributions and social status), such that in general, success and failure in the academic context tend to co-vary with success and failure in the social context and vice versa (Chen, Chang & He, 2003), there have been no studies that specifically examine the relationship between academic self-attributions and sociometric types in Spanish adolescents enrolled in secondary education.

Therefore, this study seeks to contribute new data to the research on relations between sociometric types and academic self-attributions in Spanish students, expanding the number of sociometric types examined (popular, aggressive-rejected, shy-rejected, and neglected-ignored) and behavioral categories that may appear within the class group (leader, nice, cooperative, quarrelsome, obedient and good student).

### *Objectives and hypotheses*

Namely, the present study has the following specific *objectives*: a) to analyze differences among Spanish adolescents in academic self-attributions for failure (*Ability* and *Effort*) in *Reading*, *Mathematics* and *General* as a function of the sociometric types and behavioral categories mentioned above, and b) to record whether academic self-attributions are a statistically significant, predictive variable of sociometric types and behavioral categories.

Based on prior empirical evidence, the following *hypotheses* are stated: 1) students who receive negative nominations by their peers (aggressive-rejected, shy-rejected, neglected, quarrelsome and obedient) will present significantly higher scores in self-attribution of their failures to internal causes (*Ability* and *Effort*) in *Reading*, *Mathematics* and *General* based on the *Sydney Attribution Scale*, than students who receive positive nominations by their peers

(popular, leaders, nice, cooperative and good students), and 2) sociometric type and behavioral category will be a statistically significant, predictive variable of self-attributions for academic failure in the present sample.

## Method

### *Participants*

Cluster random sampling was used (geographic areas of the Murcia Region and Alicante province: center, north, south, east, and west). In order to ensure that all geographic areas were represented, schools from each area were randomly selected, between 1 and 3 per area according to their population, for a grand total of 20 schools from rural and urban areas (14 public schools and 6 private). Once the schools were determined, four classrooms were randomly selected, yielding approximately 120 subjects per school.

The total number of subjects recruited was 1594, drawn from 1st to 4th year of compulsory secondary education (sampling error = .02). Of these, 76 (4.77%) were excluded due to errors or omissions in their responses, 40 (2.51%) were excluded due to lack of written informed consent from their parents to participate in the research, and 129 (8.09%) foreigners were excluded due to a substantial deficit in their mastery of the Spanish language. Therefore, the final sample was made up of 1349 students (697 boys and 652 girls), ranging in age from 12 to 16 years ( $M = 13.81$ ;  $SD = 1.35$ ). Of this group, 86.30% of the students were enrolled in their grade for the first time (not repeating a year in school due to academic failure). The ethnic composition of the sample was as follows: 88.9% Spanish, 6.34% Latin American, 3.37% rest of Europe, .75% Asian and .64% Arab. Distribution of the subjects by gender and school year was as follows: 386 in 7th grade (203 boys and 183 girls), 325 in 8th grade (173 boys and 152 girls), 318 in 9th grade (172 boys and 146 girls) and 320 tenth-graders (149 boys and 171 girls). Using the Chi-square test of homogeneity of frequency distribution, no statistically significant differences were found between the eight groups of gender x schoolyear ( $\chi^2 = 4.53$ ;  $p = .21$ ).

### *Instruments*

*Sociometric Nomination Test.* The sociometric test is an instrument that exposes how individuals interact within groups, and reveals the structure of the group, identifying persons who are preferred, rejected and neglected, as well as people who leaders, cooperative, trouble-

some, etc. The sociometric nomination method is based on measuring attraction and repulsion toward group members (Moreno, 1934), identifying this through choices and rejections reported by students, and classifying these along dimensions of social preference and social impact, as proposed by Peery (1979). Taking into account these two orthogonal dimensions, and by use of statistical techniques, subjects can be identified as preferred, rejected, neglected, controversial and average.

This study analyzes subjects identified as popular-preferred, rejected (aggressive-rejected and shy-rejected) and neglected-overlooked, since these categories take in the greatest number of students, and represent the best (preferred) and worst (rejected and neglected) forms of social adjustment (García-Bacete, 2007). Sociometric identification of students was carried out using the *Socio program* (González, 1990) which reveals the upper and lower limits of positive nominations received and negative nominations received for a group or class of students.

Moreover, the different behavioral categories that can appear in a social group are also analyzed: leader, nice person, cooperative, quarrelsome, obedient-submissive and good student. The probabilistic nomination procedure of three inter-gender choices was used, since it was considered the most adequate and best fitted in sociometric nomination tests (García-Bacete, 2007).

*Sydney Attribution Scale, SAS* (Marsh, 1984; adapted by Núñez & González-Pienda, 1994). This is a multidimensional scale that measures students' perceptions about the causes of their academic successes and failures. Its design is based on 24 hypothetical situations where students must respond on a 5-point Likert scale (*False* = 1, *True* = 5). The scale is a combination of three dimensions: (a) two academic areas (*Verbal-reading, Mathematics*); (b) two hypothetical outcomes (*Success, Failure*), and (c) three types of causes (*Ability, Effort, External Causes*). The combination of the 24 situations (six for success and six for failure in each academic area) and assigned to three possible causes, generates a total of 72 items. The questionnaire is founded on Weiner's attributional theory (Weiner, 1986, 2004), which postulates that subjects, when faced with a given outcome, whether positive (success) or negative (failure), will tend to explain that outcome through causes or causal factors such as Ability (or lack of ability), Effort (or lack of effort), chance or luck, and task difficulty or ease. These



causes are characterized by the dimensions of locus of control (internal or external to the subject), stability (stable vs. variable over time) and controllability (the subject believes that he or she controls the cause vs. does not this to be so). In this way, Ability is considered an internal cause, stable and uncontrollable; Effort is an internal cause, unstable and controllable; luck is an external cause, unstable and uncontrollable; and task difficulty is an external cause, stable and uncontrollable. The psychometric properties of the SAS, found for study samples of students from Australia, Chile, Spain, the USA and Philippines, indicate that this scale is an excellent measure for assessing academic self-attributions in primary and secondary education. Its adequate psychometric properties have also been verified in a university population (Inglés, Rodríguez-Marín & González-Pienda, 2008).

### *Procedure*

An interview was carried out with the principals and school psychologists of the participating schools, in order to present the research objectives, describe the assessment instruments, request permission and encourage their cooperation. Later, a meeting was held with the parents in order to explain the study to them and request their written informed consent, authorizing their children to participate in the study.

The questionnaires were completed voluntarily during a classroom session. Response sheets given to each subject were previously assigned an identification number, and their responses were later processed by computer. The instructions were read aloud, emphasizing the importance of not leaving any question unanswered. The researchers were present during administration of the tests in order to answer any questions and ensure independent administration on the part of the participants.

### *Data analyses*

Sociometric identification of students was carried out using the *Socio program* (González, 1990) which reveals the upper and lower limits of the positive nominations received (LL (pN) and UL (pN)) and the negative nominations received (LL (nN) and UL (nN)) for a group of students. These limits are obtained through calculating the binomial probability, in order to find the *t* test value associated with a determined asymmetry and level of probability < .05 (Salvosa tables). Identification is assigned by applying the following criteria: Preferred

=  $pN \geq UL$  ( $pN$ ) and  $nN < M$  ( $Nn$ ), Rejected =  $nN \geq UL$  ( $nN$ ) and  $pN < M$  ( $pN$ ), and Neglected =  $pN \leq 1$  and  $nN < M$  ( $nN$ ).

For the purpose of analyzing the relationship between sociometric types and academic self-attributions for failure, differences of means analyses were carried out to assess whether there were any differences between students who present a given category or not (e.g. popular vs. not popular) and analysis of variance (ANOVA) were used to assess differences in inter-category academic attributions. In order to identify the categories where such differences were found, *post-hoc* comparisons (Scheffé test) were carried out. Due to the study's large sample size, Student's *t* test and the *F* ratio can erroneously detect statistically significant differences. For this reason, the *d* index (standardized mean difference), proposed by Cohen (1988), was included. This makes it possible to assess the magnitude or the effect size of the differences found. Interpretation of effect size is simple: values less than or equal to 0.20 indicate a very small or insignificant effect size, between 0.40 and 0.49 small effect size, between 0.50 and 0.79 moderate, and greater than 0.80 is a large effect size (Cohen, 1988).

Predictive equations of sociometric types were established using the statistical technique of logistic regression, following the forward stepwise regression procedure based on Wald's statistic, given that the variables assessed in this study are categorical and do not fulfill the assumptions of the general linear model. Nagelkerke's  $R^2$  allowed us to assess model fit. The logistic regression analysis presents the coefficients of each variable in the regression equation, and the statistics reached by the models in classifying subjects according to their membership group (e.g. popular, aggressive-rejected, shy-rejected, neglected, leader, nice, cooperative, quarrelsome, obedient, and good student). Logistic modeling makes it possible to calculate the likelihood that an event or result will occur (e.g. high score on attributing academic failure to *Ability*), compared to its nonoccurrence, in the presence of one or more predictors (e.g. aggressive-rejected sociometric type). This likelihood is calculated using the *Odd Ratio* (OR) statistic, which is interpreted thus:  $OR > 1$  indicates that the likelihood that an event will occur increases in the presence of this variable,  $OR < 1$  indicates that the likelihood that the event will occur decreases when the variable is present, values near 1 indicate that this variable has little or no influence in predicting the event (De Maris, 2003).

## Results

### *Sociometric types, behavioral categories and self-attributions for academic failure*

Table 1 presents the differences between students according to sociometric types and behavioral categories in relation to self-attributions for academic failure (*Reading, Mathematics and General*).

Table 1. *Differences between students in scores on self-attributions for academic failure in General, as a function of sociometric type and behavioral category.*

Sociometric Type	Failure attributed to ability			Statistical significance and magnitude of the differences			Failure attributed to effort			Statistical significance and magnitude of the differences			Failure attributed to external causes			Statistical significance and magnitude of the differences		
	M	(SD)		t	p	D	M	(SD)		t	p	d	M	(SD)		t	p	d
Not Popular	4.80	1.47					5.62	1.22					6.48	1.16				
Popular	4.79	1.44		.03	.97	-	5.56	1.31		.61	.54	-	6.40	1.05		.84	.39	-
Not aggressive-rejected	4.78	1.46					5.60	1.23					6.48	1.14				
Aggressive-rejected	5.34	1.50		-2.23	.02	-0.48	6.02	1.17		-1.96	.05	-0.34	5.90	1.35		2.94	.00	0.51
Not Shy-rejected	4.78	1.46					5.60	1.23					6.47	1.14				
Shy-rejected	5.80	1.62		-3.24	.00	-0.70	6.15	1.39		-2.03	.04	-0.45	6.12	1.39		1.44	.15	-
Not Neglected	4.78	1.47					5.61	1.24					6.47	1.14				
Neglected	5.01	1.31		-1.21	.22	-	5.72	1.12		-.75	.45	-	6.30	1.27		1.19	.23	-
Nonleader	4.85	1.45					5.59	1.22					6.47	1.15				
Leader	4.56	1.50		2.95	.00	0.20	5.67	1.32		-.89	.37	-	6.46	1.15		.14	.89	-
Not Nice	4.75	1.43					5.58	1.21					6.45	1.15				
Nice	4.82	1.57		-.72	.46	-	5.69	1.35		-1.46	.14	-	6.52	1.12		-.92	.35	-
Not Cooperative	4.95	1.46					5.68	1.24					6.48	1.17				
Cooperative	4.25	1.34		7.54	.00	0.49	5.34	1.22		4.31	.00	0.28	6.44	1.09		.55	.58	-
Not Quarrelsome	4.73	1.44					5.57	1.24					6.46	1.13				
Quarrelsome	4.88	1.51		-1.54	.12	-	5.74	1.23		-2.03	.04	-0.14	6.48	1.22		.34	.73	-
Not Obedient	4.78	1.48					5.63	1.23					6.46	1.12				
Obedient	4.78	1.43		-.04	.96	-	5.56	1.31		.89	.37	-	6.48	1.21		-.25	.80	-
Not Good Student	4.97	1.47					5.72	1.23					6.47	1.17				
Good Student	4.19	1.28		8.41	.00	0.55	5.31	1.22		5.12	.00	0.33	6.48	1.09		-.16	.86	-

Results indicate that significantly higher mean scores are found in the aggressive-rejected group as compared to those not aggressive-rejected, in the shy-rejected group as compared to those not shy-rejected, in the group of nonleaders compared to the leaders, in the noncooperative group compared to cooperative, and in the not good students group when compared to those nominated as good students, in reference to *attributing failure in Reading to Ability*. The effect size of these differences is small in magnitude in all cases ( $d < 0.50$ ), except in the shy-rejected group, where the effect size is of moderate magnitude ( $d \geq 0.50$ ). As for *attributing failure in Reading to Effort*, significantly higher mean scores are found in the noncooperative group compared to cooperative, in the quarrelsome group compared to the nonquarrelsome, and in the not good students group when compared to those nominated as good students. The effect size of these differences is small in magnitude in all cases ( $d < 0.50$ ). As for *attributing failure in Reading to External causes*, significantly higher mean scores were presented only by the not aggressive-rejected group, compared to the aggressive-rejected, with the effect size of this difference being small in magnitude ( $d < 0.50$ ).

On the other hand, significantly higher mean scores are found in the group of shy-rejected students compared to the not shy-rejected, in the group of leaders compared to the nonleaders, in the noncooperative group compared to the cooperative group, and in the group of not good students compared to those nominated as good students, in *attributing failure in Mathematics to Ability*. The effect size of these differences is small in magnitude in the case of leaders and cooperative students ( $d < 0.50$ ), and of moderate magnitude in the shy-rejected group and in good students ( $d \geq 0.50$ ). As for *attributing failure in Mathematics to Effort*, significantly higher mean scores are found in the group of shy-rejected students compared to the not shy-rejected, in the group of nice persons compared to the not nice group, in the noncooperative group compared to the cooperative group, and in the group of not good students compared to those nominated as good students. The effect size of these differences is small in magnitude in all cases ( $d < 0.50$ ). Regarding *attributing failure in Mathematics to External causes*, significantly higher mean scores are found only in the group of not aggressive-rejected, compared to the aggressive-rejected, with the effect size of this difference being small in magnitude ( $d < 0.50$ ).

Finally, significantly higher mean scores are found in the aggressive-rejected group compared to those not aggressive-rejected, in the shy-rejected group compared to the not shy-

rejected, in the group of nonleaders compared to leaders, in the noncooperative group compared to the cooperative and in the not good students group compared to those nominated as good students, in *attributing failure in general to Ability*. The effect size of these differences is small in magnitude in the group of aggressive-rejected, nonleaders and noncooperative ( $d < 0.50$ ), and of moderate magnitude ( $d \geq 0.50$ ) in the shy-rejected group and in not good students. As for *attributing failure in general to Effort*, significantly higher mean scores are found in the aggressive-rejected group compared to the not aggressive-rejected, in the shy-rejected group compared to the not shy-rejected, in the noncooperative group compared to the cooperative, in the quarrelsome group compared to the not quarrelsome, and in the not good students group compared to those nominated as good students. The effect size of these differences is small in magnitude in all cases ( $d < 0.50$ ). As for *attributing failure in General to External causes*, significantly higher mean scores are found only in the group of not aggressive-rejected, compared to the aggressive-rejected students. The effect size of these differences is moderate in magnitude ( $d \geq 0.50$ ).

Analysis of variance (ANOVA) shows that the group of shy-rejected students presents significantly higher mean scores than the popular group ( $p < .05$ ) in *attributing failure in Reading to Ability*, with the effect size of this difference being moderate in magnitude ( $d \geq 0.50$ ). The nice students present significantly higher scores than the cooperative students ( $p < .05$ ) in *attributing failure in Reading to Ability*, the effect size of this difference having large magnitude ( $d \geq 0.80$ ). The group of shy-rejected students presents significantly higher mean scores than the popular group ( $p < .05$ ) in *attributing failure in Mathematics to Effort*, with the effect size of this difference having moderate magnitude ( $d \geq 0.50$ ). Similarly, the nice students present significantly higher scores than the cooperative students and good students ( $p < .05$ ), the effect size of these differences having moderate magnitude ( $d \geq 0.50$ ). On the other hand, the shy-rejected students present significantly higher scores than the popular students ( $p < .05$ ) in *attributing failure in General to Ability*, with an effect size of moderate magnitude for this difference ( $d \geq 0.50$ ). Similarly, the nice students present significantly higher scores than the cooperative students ( $p < .05$ ), the effect size of this difference having a large magnitude ( $d \geq 0.80$ ). Regarding *attributing failure in General to Effort*, the popular students present significantly lower scores than the nice students ( $p < .05$ ), with an effect size of moderate magnitude for this difference ( $d \geq 0.50$ ). Finally, in *attributing failure in General to External*

*causes*, quarrelsome students present significantly higher scores than the cooperative students ( $p < .05$ ), the effect size of this difference having moderate magnitude ( $d \geq 0.50$ ).

### *Predicting self-attributions for academic failure as a function of sociometric type and behavioral categories*

The binary logistic regression analyses showed that sociometric types and behavioral categories were a statistically significant variable for predicting self-attributions for academic failure.

From the analysis of our sample, it was possible to create eight logistic models that predicted the likelihood of attributing one's failure in *Reading*, *Mathematics* and *General to Ability*, to *Effort* or to *External causes* according to sociometric types and behavioral categories. Thus, sociometric types and behavioral categories (popular, aggressive-rejected, shy-rejected, neglected, leader, nice, cooperative, quarrelsome, obedient and good student) were included as predictive variables in all the logistic models created, although not all of them were significant.

The proportion of cases correctly classified by the logistic models varied according to the type of academic attribution for failure that was analyzed. The model of *attributing failure in reading to Ability* correctly estimates 52% of the cases (Nagelkerke  $R^2 = .004$ ) for aggressive-rejected students, 53.1% for the leaders group (Nagelkerke  $R^2 = .01$ ), 54.5% for the cooperative group (Nagelkerke  $R^2 = .02$ ) and 54.1% for the good students group (Nagelkerke  $R^2 = .02$ ). The model of *attributing failure in reading to Effort* correctly estimates 51.9% of the cases (Nagelkerke  $R^2 = .01$ ) for cooperative students, 53.1% for the quarrelsome group (Nagelkerke  $R^2 = .01$ ) and 52.8% for the good students group (Nagelkerke  $R^2 = .01$ ). The model of *attributing failure in reading to External causes* correctly estimates 56.1% of the cases (Nagelkerke  $R^2 = .01$ ) for aggressive-rejected students and 55% for the quarrelsome group (Nagelkerke  $R^2 = .002$ ). The model of *attributing failure in mathematics to Ability* correctly estimates 54.8% of the cases (Nagelkerke  $R^2 = .02$ ) for the cooperative students and 56.2% for the good students group (Nagelkerke  $R^2 = .03$ ). The model of *attributing failure in mathematics to Effort* correctly estimates 54.6% of the cases (Nagelkerke  $R^2 = .02$ ) for the

cooperative students and 54.5% for the good students group (Nagelkerke  $R^2 = .02$ ). The model of *attributing failure in mathematics to External causes* correctly estimates 54.4% of the cases (Nagelkerke  $R^2 = .01$ ) for the popular students. The model of *attributing failure in general to Ability* correctly estimates 52.2% of the cases (Nagelkerke  $R^2 = .01$ ) for the neglected students, 53.7% for the leaders group (Nagelkerke  $R^2 = .01$ ), 59.1% for the cooperative group (Nagelkerke  $R^2 = .05$ ), 51.7% for the quarrelsome group (Nagelkerke  $R^2 = .004$ ) and 60.3% for the good students group (Nagelkerke  $R^2 = .06$ ). The model of *attributing failure in general to Effort* correctly estimates 55.6% of the cases (Nagelkerke  $R^2 = .02$ ) for the cooperative students, 52.6% for the quarrelsome group (Nagelkerke  $R^2 = .01$ ) and 56.2% for the good students group (Nagelkerke  $R^2 = .02$ ). The model of *attributing failure in general to External causes* correctly estimates 52.6% of the cases (Nagelkerke  $R^2 = .004$ ) for the aggressive-rejected students.

The OR of the logistic models for predicting self-attributions for failure show (see Table 2): a) that the aggressive-rejected students are 105% more likely to self-attribute failure in *reading to Ability*, leaders are 32% less likely, the cooperative students are 43% less likely and those nominated as good students 40% less likely; b) that the cooperative students are 25% less likely to attribute their failure in *reading to Effort*, the quarrelsome students are 32% more likely and good students 30% less likely; c) that the aggressive-rejected students are 68% less likely to attribute their failure in *reading to External causes* and the quarrelsome students 14% less likely; c) that the cooperative students are 43% less likely to attribute their failure in *mathematics to Ability*, and good students 52% less likely; d) that the cooperative students are 44% less likely to attribute their failure in *mathematics to Effort* and the good students are 43% less likely; e) that the popular students are 28% less likely to attribute their failure in *matemáticas to External causes*; f) that the neglected students are 89% more likely to attribute their failure in *general to Ability*, leaders are 28% less likely, the cooperative are 59% less likely, the quarrelsome are 30% more likely and the good students 65% less likely; g) that the cooperative students are 42% less likely to attribute their failure in *general to Effort*, the quarrelsome are 41% more likely and the good students 44% less likely; and h) that the aggressive-rejected students are 52% less likely to attribute their failure in *general to External causes*.

Table 2. Results from the binary logistic regression for the likelihood of presenting high scores in causal self-attributions for failure in General as a function of sociometric type and behavioral category.

DV	IV	B	S.E.	Wald	p	OR	C.I. 95%
Causal attributions							
Failure attributed to Ability	<i>Neglected</i>	.64	.26	5.93	.01	1.89	1.13-3.16
	Constant	.06	.06	1.01	.31	1.06	
Failure attributed to Effort	<i>Leader</i>	-.33	.13	6.36	.01	.72	.56-.93
	Constant	.13	.07	3.73	.05	1.14	
	<i>Cooperative</i>	-.89	.13	43.44	.00	.41	.31-.53
	Constant	.28	.07	17.76	.00	1.33	
	<i>Quarrelsome</i>	.26	.13	3.85	.05	1.30	1.00-1.68
	Constant	-.01	.07	.01	.92	.99	
	<i>Good Student</i>	-1.05	.14	58.11	.00	.35	.27-.46
	Constant	.31	.07	22.02	.00	1.37	
	<i>Cooperative</i>	-.55	.13	17.36	.00	.58	.44-.75
	Constant	.17	.07	6.49	.01	1.19	
Failure attributed to External causes	<i>Quarrelsome</i>	.34	.13	6.70	.01	1.41	1.09-1.83
	Constant	-.04	.07	.32	.57	.96	
	<i>Good Student</i>	-.59	.13	19.57	.00	.56	.43-.72
	Constant	.21	.07	9.76	.00	1.23	
Failure attributed to External causes	<i>Aggressive-rejected</i>	-.74	.36	4.24	.04	.48	.23-.96
	Constant	.09	.05	2.74	.09	1.09	

Note: B = coefficient; S.E. = standard error; p = probability; OR = odds ratio; C.I. = confidence interval of 95%.

## Discussion and Conclusions

The objective of this study was to analyze the relationship between sociometric type and self-attributions for academic failure in a sample of Spanish adolescents. In contrast to previous studies, this study expanded the number of sociometric types examined and the different behavioral categories that can appear within a classroom / social group. In a further change from prior studies, this investigation considered this relationship by incorporating analysis of effect sizes, recommended by different authors (e.g., Cohen, 1988; García, Ortega & De la Fuente, 2011), to determine the magnitude of the differences found, in other words, their theoretical and practical meaning.



Results from this study reveal that sociometric types and behavioral variables were significant predictive variables in academic self-attributions for failure, since those students who received the greatest number of negative nominations by their peers (unpopular students, aggressive-rejected, shy-rejected, neglected, nonleaders, quarrelsome, noncooperative and not good students) presented higher scores in attributing academic failure to *Ability* and to *Effort* (in *Reading*, *Mathematics* and in *General*) than students who were nominated positively by their peers (popular, leaders, not aggressive-rejected, not shy-rejected, not neglected, not quarrelsome, cooperative and good students); this difference, however, was statistically significant only in the groups of students nominated as aggressive-rejected, shy-rejected, nonleaders, noncooperative and not good students, thus confirming our first hypothesis. The results of this research are in harmony with results from prior studies that emphasize the relationship between causal attributions and social status, using populations from Spain and other countries. This type of attribution to internal causes like Ability and Effort produces feelings of self-confidence in the subject, which directly influences their self-concept, their own social competency, their performance motivation and motivation for learning (Hayamizu & Weiner, 1991; Jiménez, 2003; Muñoz, Trianes & Jiménez, 1994; Zhao & Su, 2005).

Additionally, analyses of variance revealed statistically significant differences in certain sociometric types and behavioral categories as a function of the self-attributions for academic failure. Along these lines, the shy-rejected students present significantly higher scores than the popular students in attributing failure in *General* to *Ability*. This result can be explained in the terms of Wichmann, Coplan and Daniels (2004), who affirm that students identified by their classmates as socially withdrawn present an attributional pattern of self-rejection (internal, stable attribution for failures); they show familiarity with social failure in social interactions, less self-efficacy for developing assertive goals and for problem solving, and more of a preference toward inhibited, nonassertive strategies for managing conflict situations, thereby confirming a similarity or parallelism between the academic and social contexts, as indicated by diverse authors (Weiner, 2004). In agreement with our second hypothesis, sociometric types were a significant predictor of academic self-attributions, given that students with negative nominations by their classmates (e.g. aggressive-rejected, quarrelsome and neglected) were more likely to attribute their academic failures to *Ability* and *Effort*. In addition, the *F* ratio is very sensitive to the sample size, creating the possibility that statistically significant differences could be erroneously detected (Cohen, 1988). In order to avoid this

bias, effect sizes were calculated, as proposed by Cohen (1988). These calculations, however, confirmed that the magnitude of the differences was moderate in most cases.

The results of this study reveal, on one hand, the utility of sociometric methods in research carried out at schools, because of their easy application and empirical validity, etc. (Muñoz, Moreno & Jiménez, 2008); and on the other hand, the relationship of sociometric types to different cognitive-motivational variables (e.g. academic self-attributions) and their influence on social adjustment.

This study is not free of limitations. First, although the sampling method ensures representativeness of the recruited sample with respect to the target population, the results of this study may not be generalized to Spanish students at other stages of education (Early Childhood, Primary, Post-compulsory Secondary, and Higher Education). Future research should confirm whether results found in compulsory secondary education differ or are upheld at other educational levels. Second, it would also be inadequate to generalize findings to Spanish students in compulsory secondary education who have learning disorders or psychopathological disorders, aspects that can clearly alter the students' social and academic behavior. Moreover, keeping in mind the situational specificity principle that characterizes social behavior, the results could scarcely be extrapolated to secondary students from other cultures or ethnicities. Third, it would be interesting for future studies to include different sources for assessing social behavior (self-reports, teachers) so that inter-source agreement could be analyzed. Fourth, future studies ought to analyze the different groups of neglected and rejected students (Estévez et al., 2006) as well as the sociometric categories of controversial and average, since omission of these analyses may generate incomplete results when classifying students into a particular sociometric type. Fifth, future studies should use longitudinal designs in order to contribute more conclusive data about the influencing relationships between these variables. Finally, the present study seeks to understand the predictive ability of sociometric and behavioral characteristics for academic self-attributions, and not the other way around (predictive ability of academic self-attributions on sociometric types and behavioral characteristics). Though logical to think that there is a reciprocal effect, future research could analyze this question by elaborating two structural equation models in order to see what hypothesis is most sustainable, or in any case, what is the strength of the associations in both models.

At the practical level, and first of all, the results of this research point to working with students to identify and treat learning problems that may interfere in their scholastic performance. Along this line, it would be highly important to understand each student's attributional style and guide him or her towards the most adaptive possibility, in other words, to attribute their successes to stable, controllable and internal causes, such as *Ability* and *Effort*, with the objective of increasing their academic achievement, and at the same time, improve social adjustment. In second place, it is important to work on the specific identification of risk and protection factors for scholastic achievement, and accompany that by adequate training to enable the use of effective cognitive and self-regulation strategies that stimulate the development of feelings of confidence in one's own abilities (González-Pienda et al., 2000), and so improve achievement (de la Fuente, Justicia, Sander & Cardelle-Elawar, 2014). The empirical evidence shows that identifying and managing these factors at school improves the child's emotional well-being and his or her resilience capacity (Suriá, 2016). Finally, while the importance of studying sociometric types in adolescents lies mainly in its effect on social development and interaction skills (Bukowski, Bredgen & Vitaro, 2007), we must stress that sociometric types do not only affect the social area, but also the academic sphere (Meijls, Cillessen, Scholte, Segers & Spijkerman, 2010). Specifically, different studies have indicated that being identified as preferred in adolescence becomes an influential variable in repetition of a year in school (Lubbers et al., 2006), in scholastic achievement (Véronneau, Vitaro, Brendgen, Dishion & Tremblay, 2010) and in expectations about academic performance (Cillessen & Mayeux, 2007). These aspects make it especially necessary to consider peer relationships in adolescence, since the beginning of secondary education is a factor tending toward greater interaction with one's peers, with the initial ambiguity created by the new situation, and the frequent change in classmates making it necessary to interact with a greater number of students (Herrenkohl et al., 2001).

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