Psicothema

Psicothema 2020, Vol. 32, No. 3, 366-373
doi: 10.7334/psicothema2019.216

ISSN 0214 - 9915 CODEN PSOTEG

www.psicothema.com

# Causal attributions in Early Childhood Education: A new categorization system

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## Abstract

**Background:** From Early Childhood Education onwards, causal attributions influence explanations of school performance. We performed a systematic review of the available knowledge (1970-2019) about Weiner's (1986) Attribution Theory of the Motivation of Achievement in order to examine studies related to the causal attributions of success and failure at school. We found numerous empirical studies related to Bernard Weiner´s theory. However, little research exists about students in Early Childhood Education. Therefore, the aim of this study was to identify the causes to which children attribute their successes and failures during this educational period. **Method:** A sample of 200 students aged between 3 and 6 years old was selected. To collect the data, an individually implemented Piagetian clinical interview was used. **Results:** A large volume of qualitative information was collected for classification which exceeded Weiner´s traditional causal attributions. Creating a category to group all new attributions implied losing too much information under a non-specific label. **Conclusion:** A new categorization of the causal attributions was designed, made up of 10 categories -adapted to the 3-6 years age range- which revises and expanding on the categorization created by Weiner.

***Keywords:*** Causal attributions; categorization; early childhood education; school success; school failure.

## Resumen

***Atribuciones causales en Educación Infantil: nuevo sistema de categorización*. Antecedentes:** las atribuciones causales de la motivación influyen desde Educación Infantil en la explicación del rendimiento escolar. Se realizó una revisión sistemática de los conocimientos disponibles (1970-2019) de la Teoría Atribucional de la Motivación de Logro de Weiner (1986) para conocer los trabajos relacionados con las atribuciones causales del éxito y fracaso escolar. Se hallaron numerosos estudios empíricos relacionados con la teoría de Bernard Weiner. Sin embargo, son escasas las investigaciones con estudiantes de Educación Infantil. Por ello, el objetivo de este estudio fue identificar las causas a las que atribuyen sus éxitos y fracasos escolares en Educación Infantil. **Método:** se seleccionó una muestra de 200 estudiantes con edades comprendidas entre los 3 y 6 años. Para recopilar los datos se utilizó una entrevista clínica piagetiana implementada individualmente. **Resultados:** se recopiló un gran volumen de información cualitativa para clasificar que desbordaba las atribuciones causales tradicionales de Weiner. Crear una categoría para agrupar todas las nuevas atribuciones implicaba perder demasiada información bajo una etiqueta inespecífica. **Conclusión:** se diseñó una nueva categorización de las atribuciones causales formada por 10 categorías –adaptada al rango de edad 3-6 años– que revisa y amplía la creada por Weiner.

***Palabras clave:*** atribuciones causales; categorización; educación infantil; éxito escolar; fracaso escolar.

An individual's causal background, together with their attributional patterns, influence the development of their future expectations of success and failure, concept of self, self-esteem and school performance. All of this causes certain emotions closely related to motivation which interfere with the individual's behavior in the classroom (Weiner, 1985, 1988, 2000; Weiner & Graham, 1989) and, depending on the causes to which success or failure at school is attributed, important psychological consequences may result (Weiner, 1972).

The Attribution Theory of Achievement Motivation of Weiner (1974, 1979, 1980, 1986), developed out of the contributions of Stanley, Stanford, Terman, Marquis and Atkinson (Weiner, 2010), takes Rotter and Heider into consideration whilst attempting to complete the Kelley model. This theory relates the learning problems present throughout schooling with the expectations and causal attributions vis-á-vis academic results (Valdivieso-León, 2015). In addition, it seeks to explain achievement behavior by means of the perceived causal attributions and the cognitive and affective consequences it produces (Weiner, 1986). Certain attributions positively affect the expectations of academic success and they are closely related to the motivation of achievement (Valenzuela, 2007; Weiner, 1972).

The attributional process begins when students generate motivation regarding the activity after seeking different interpretations of the results obtained (Weiner, 1986).

Each individual can express a limited number of attributions, although there are numerous reasons for explaining the results of success or failure. The causal attributions -with greater acceptance

Received: July 23, 2019 • Accepted: February 3, 2020
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among researchers- for explaining academic performance are as follows: ability, effort, difficulty of the task and luck (González & Valle, 2006). However, there are others such as mood, tiredness, help from teachers, etc. (see in Barca, Peralbo, & Breenlla, 2004; García, 2006; Navas, Castejón, & Sampascual, 2000; Navas, Sampascual, & Castejón, 1995; Talou, Borzi, Sánchez, & Iglesias; 2004; or in Weiner, 1974, 1986, 1990, 2010).

Therefore, there are a variety of taxonomies -but none for Early Childhood Education- with their corresponding attributional dimensions -which are a key element for Weiner (1985)-, because they give psychological meaning to the attributions (Miñano & Castejón, 2008) and are organized according to the place of causation, stability over time and controllability.

Weiner -in his theory- gives priority to perceived causation over real causation (Valdivieso-León, 2015). Regardless of what created the result, what the person believes to be the cause and the causal dimension within which it is identified is of greater relevance (Navas et al., 1995; Sampascual, Navas, & Castejón, 1994). There are adaptive attributional schemata that encourage motivation and academic performance against maladaptive ones that inhibit it (González & Tourón, 1992). The general tendency to establish harmful attributions is more important than the isolated assignation of a result to a specific cause (Alonso, 1991).

This theory gave rise to a large number of studies and it is corroborated by a considerable amount of empirical evidence. Some examples are the studies by Rodríguez (2010), Valle, Núñez, Rodríguez & González-Pumariega (2002), or also by Weiner (1985, 1986, 2008).

A review of the findings available concerning causal attributions has brought to light empirical papers that relate Weiner's theory to different variables, including academic performance and concept of self or self-efficacy. There are many studies with secondary and university education participants (e.g. Barca et al., 2004; Matos, Otero, & Díaz, 2017; Miñano & Castejón, 2008; Navas et al., 2000; Ramudo, Barca, Brenlla-Blanco, & Barca, 2017; Rodríguez & Guzmán, 2016; Sáez, Bustos, Pérez, Mella, Lobos, & Díaz, 2018; Soria, Otamendi, Berrocal, & Caño, 2004; Valenzuela, 2007; Zubeldia, Díaz, & Goñi, 2018). In Primary School students, academic causal attributions are related to perfectionism (Vicent, English, Gonzálvez, Sanmartín, Aparicio-Flores, & García-Fernández, 2019); with personal variables predictive of academic performance (Gisbert, 2015); or a comparison is made of their choice by gender (Lohbeck, Grube, & Moschner, 2017). However, there is little research in Early Childhood Education and the first cycle of Primary Education (e.g. García-Señorán, Conde, & González, 2010; Legare, Gelman, & Wellman, 2010; Valdivieso-León, 2014, 2015; Valdivieso-León, Carbonero, & Román, 2011).

The study by Alonso (1983), who noted that students under 11 years of age have insufficient knowledge of the variables that determine motivation for achievement (Valdivieso-León, 2015), is considered a direct predecessor of this research. Alonso (1983) established that causal attributions do not appear to arise at an early age but develop afterwards. Although it is undeniable that cognitive processing is simpler in Early Childhood Education, they express similar inferences to those of adults regarding the causes of school performance.

However, Valdivieso-León (2015) found evidence that causal attributions begin to take shape at an earlier age and that the educational context mediates and modifies the initial attributions. It was this absence of empirical studies analyzing causal attributions in Early Childhood Education that motivated this investigation. Within this theoretical-conceptual framework, the objective is to identify the causes to which Early Childhood Education students attribute their successes and failures, as well as to analyze how they evolve with age.

## Method

### *Participants*

236 subjects were interviewed. 36 students were excluded as a result of three criteria: providing no answer during the interview, not having sufficient language to express their ideas given their early age and / or displaying special educational needs that prevented them from understanding and / or answering the questions.

Finally, the responses of 200 students of 1st, 2nd and 3rd of Early Childhood Education -87 boys (43.5%) and 113 girls (56.5%)-, interviewed during the months of January to April, were analyzed. The students were aged between three and six years. They were distributed uniformly in four groups of 50 subjects for each age. They attended three subsidised schools located in the urban area of the province of Valladolid. They came from predominantly conventional families (86.5%). The parents had an average age of 40 years and a medium-high socioeconomic status.

### *Instruments*

The causal attributions of school successes and failures were collected by the "Piagetian clinical interview" of Delval (1995), which is semi-structured and individually applied.

### *Procedure*

An informative meeting was held with the families of Early Childhood Education students of different educational centers -which have a collaboration agreement with the GIE GR179 CyL in Educational Psychology of the University of Valladolid-. Written informed consent and authorization was requested to conduct an interview with their son or daughter about the causes to which they attribute their success or failure at school.

Each interview lasted approximately 25 minutes. In the interview use was made of materials dealt with at school during the first and second terms, grouped by the form teacher in the form of a booklet with all the activities performed by each subject. The students brought this to the room where the researcher was. A series of activities were previously selected and all students of the same year evaluated these activities.

These questions were asked regarding the following school tasks: Free drawing, Writing of letters, Writing of numbers and Geometric figures. With the youngest (3 years old) Writing of letters -which they had not yet started- was replaced by Geometric figures.

We searched for activities *well done* (indicative of school success) and *poorly done* (indicative of failure at school). The students showed their activities to the researcher and pointed out which they had done better or worse according to feedback from the teacher, who, when correcting the activity, graded it with: Good, Average or Poor. They also used stamps with a smiling and sad face indicating the degree of success they had achieved during the task.

Here is an example of how an interview was conducted, with the questions asked -in each selected task- by means of a literal transcript from student AM132:

- Why do you think you did it well?
- I did it well because I practise a lot at home.
- So, do you think the reason you are doing well is because you practise a lot at home?
- Yes, I do a lot of homework in my house.
- Who tells you that you have to practise?
- Me. Sometimes my teacher gives me homework and other times my dad gets me files from the internet.

Activities carried out correctly and incorrectly were balanced. The subject was also asked about the causes of failure. The conversation continued with the student, as they explained their homework or what happened whilst doing it, in order to obtain all possible information.

The different questions were repeated several times to the same subject -even on different days- to check if the subjects responded consistently.

The interviewer did not question the mark obtained or the explanation given by the subject, but simply recorded the information by means of a digital recorder. Finally, the students returned to the classroom.

*Data analysis*

The sample was incidental and non-probabilistic. To overcome disadvantages, a sampling by quotas was implemented: criterion *chronological age*, with four groups -of 50 subjects each- representing all the ages of the participants (3, 4, 5 and 6 years).

The interviews were transcribed and the large amount of qualitative data was analyzed with the program *Altas.ti 7*, which permits entering data, establishing categories and creating maps that represent relationships between responses. It was discovered that it was not possible to include all the information in the four Weiner categories. And creating a "catch-all" category was not sufficient for grouping all the diverse and meaningful information collected if it was examined and organized into distinct categories.

Consequently, it was deemed necessary to create new relevant and significant units of analysis which would make it possible to categorize the causal attributions of the sample under study.

A new categorization system was developed using the principles of the *hermeneutical triangulation* (Cisterna, 2005), which involve selecting appropriate and significant information in an organized manner. In addition, it was necessary to establish basic classifications of logically structured concepts (Thiebaut, 1998), as a result of which subcategories were constructed whose grouping allowed the determining of *aprioristic categories* which should group all the ideas that are related by using a word -as unifying criteria- (Hernández, Fernández, & Baptista, 2006). Five psychology researchers proceeded to analyze the information obtained (they were given literal examples of the students' responses) by inferential procedure (an action of ascending and dialectic triangulation).

Next, all the definitions of the categories and subcategories taken both textually and typographically from the Dictionary of the RAE (2018) were included. These two actions are intended to delimit the classification criteria of the new categorization, so that it might prove to be a useful tool for educators who work under the guidance of this paradigmatic perspective, whilst helping other researchers to organize their information on children's causal attributions.

It was at this time when the categories and subcategories, together with their definition and literal examples, were subjected to the evaluation of international experts; this was in order to find out whether they would organize the information in the same way, give a different name to the categories, or whether they agreed with the proposed categorization.

Finally, the content validity was examined and agreement between judges was sought according to the guidelines of Escobar-Pérez & Cuervo-Martínez (2015) and employing the statistics of Kappa and Kendall. "R" software was used for descriptive analyses of each category and a 95% confidence interval (R Core Team, 2012).

## Results

*New categorization of causal attributions*

The new categorization adapted to Early Childhood Education was sent to 20 international experts, namely, doctors and university professors and belonging to the knowledge areas of Evolutionary and Developmental Psychology, Pedagogy and Psychopedagogy, of Spain, Colombia, Chile, Venezuela, Holland, Italy and Portugal. There were 16 respondents, who addressed the following questions:

a) Rate your *degree of agreement* with the following questions (using a 1-4 Likert scale response format):

   1. Is the way in which the categories are presented suitable?
   2. Is the source used to define the categories and sub-categories appropriate?
   3. Do you agree with the denomination of the categories?
   4. And with the denomination of the sub-categories?
   5. Do the examples obtained from the transcripts illustrate the categories?

The average score of the experts' assessments was between 3.3 and 3.9, with a Kappa value equal to .77 and a Kendall coefficient of .87.

b) Answer (yes or no) to these four questions:

   1. Would you change the name of any category?
   2. Would you change the name of any sub-category?
   3. Would you group some categories?
   4. Would you organize the categories and subcategories differently?

If their answer was yes, they were requested to explain their reasons and indicate their proposals for change or improvement by means of an open response. The proposals, suggestions and modifications made were collected and the definitive system of subcategories and categories for the causal attributions of school success and failure among Early Childhood Education students -hitherto non-existent- was drawn up.

The new system of causal attributions is composed of 10 categories and in some of them it was necessary to include subcategories: Ability; Effort (Practising, Listening, Copying, Thinking, Speed to act and Task execution); Task difficulty; Classroom behavior (Focused, Calm and Quiet); Influence of other educational agents (Classmates, Teacher and Family); Mediational instruments; Physical and mental state; Task motivation; Imaginative excuse; No answer (Table 1).

From the answers provided and via the language of a child, it is possible to infer -with a high rate of agreement "between judges"- one or another causal attribution of successes and failures. Table 1 includes several examples of literal expressions of the students.

All the categories (and sub-categories) are valid for explaining both school success and failure, for example, Speed to act is considered an example of Effort when carrying out academic activities on the basis of whether the student acts more or less quickly, because it determines the final result of the task.

It should be noted that the category Luck category *(D),* belonging to the categorization of Weiner (1986), was not sufficiently significant among the participants' responses for it to be part of the statistical analyses.

*Number of responses for each activity*

In the Free drawing and Writing of numbers activities 200 students answered. However, in Writing of letters only 150 students answered (4, 5 and 6 years). For the remaining 50 students -3 years- these were replaced by the Geometric figures task. Students could attribute their success and failure at school to different causes within the same activity, and responded at most by referring to three different categories (Table 2).

*Number of responses in each category and sub-category*

The number and percentage of subjects that answered a certain category or sub-category for each of the activities is shown. Attributions to school success and failure are found in Table 3 and Figures 1 and 2, respectively. The total sum of answers is greater than 200 because the same student may have several answers, but the percentage is calculated by considering a total sample size of 200 (except missing).

The percentages in the causal attributions variable were compared by contrasting the global hypothesis of equality of

*Table 1*
Categorization system for causal attributions of school success and failure in Early Childhood Education

| Cod. | Category | Cod. | Sub-category | Literal example |
|---|---|---|---|---|
| A | Ability | | | "I'm smart"; "I do it well" |
| B | Effort | B1 | Practising | "I practise at home"; "I do a lot of homework in my house" |
| | | B2 | Listening | "Because I don't listen to my teacher." |
| | | B3 | Copying | "I copied from my classmate"; "I copied the drawing on the board." |
| | | B4 | Thinking | "I thought a lot, a lot" |
| | | B5 | Speed to act | "I did it very fast" |
| | | B6 | Task execution | "Down and up"; "I didn't leave blanks" |
| C | Task difficulty | | | "It was very easy / difficult" |
| E | Classroom behavior | E1 | Focused | "I didn't concentrate"; "I'm attentive in class" |
| | | E2 | Calm | "I do it well if I'm sitting down and I don't move from my desk" |
| | | E3 | Quiet | "Because I was quiet" |
| F | Influence of other educational agents | F1 | Classmate | "My classmate pushed me"; "My classmate painted it for me" |
| | | F2 | Teacher | "My teacher gave me a Good"; "I did it like my teacher" |
| | | F3 | Family | "My dad tells me that I paint well" |
| G | Mediation Instruments | | | "It was crayon and the tip is fat" |
| H | Physical and mental state | | | "I was tired"; "My arm got tired" |
| I | Motivation to do the task | | | "I do well because I like maths" |
| J | Imaginative excuse | | | "A pixie rushes me and I make mistakes" |
| K | No answer | | | |

*Table 2*
Number of explanations for school success and failure for each group of activities

| | | Free drawing | | Writing of numbers | | Writing of letters | | Geometric figures | |
|---|---|---|---|---|---|---|---|---|---|
| | Explanations | n | % | n | % | n | % | n | % |
| Success | 1 | 98 | 49 | 121 | 52 | 121 | 60.5 | 31 | 62 |
| | 2 | 65 | 32.5 | 57 | 34 | 57 | 28.5 | 14 | 28 |
| | 3 | 37 | 18.5 | 22 | 14 | 22 | 11 | 5 | 10 |
| Failure | 1 | 113 | 56.5 | 105 | 70 | 138 | 69 | 41 | 82 |
| | 2 | 62 | 31 | 39 | 26 | 55 | 27.5 | 7 | 14 |
| | 3 | 3 | 25 | 12.5 | 6 | 4 | 7 | 3.5 | 2 |

*Table 3*
Students responding to each category to justify school success and failure for each group of activities

| | School success | | | | | | | | School failure | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Free drawing N = 200 | | Writing of numbers N = 150 | | Writing of letters N = 200 | | Geometric figures N = 50 | | Free drawing N = 200 | | Writing of numbers N = 150 | | Writing of letters N = 200 | | Geometric figures N = 50 | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| A | 44 | 22 | 29 | 19.3 | 55 | 27.5 | 19 | 38 | 22 | 11 | 26 | 17.3 | 38 | 19 | 6 | 12 |
| B1 | 7 | 3.5 | 12 | 8 | 12 | 6 | 2 | 4 | 3 | 1.5 | 4 | 2.6 | 3 | 1.5 | 1 | 2 |
| B2 | 4 | 2 | 8 | 5.3 | 6 | 3 | 0 | 0 | 2 | 1 | 2 | 1.3 | 2 | 1 | 0 | 0 |
| B3 | 15 | 7.5 | 10 | 6.6 | 7 | 3.5 | 0 | 0 | 5 | 2.5 | 1 | 0.6 | 1 | 0.5 | 0 | 0 |
| B4 | 8 | 4 | 6 | 4 | 10 | 5 | 0 | 0 | 1 | 0.5 | 1 | 0.6 | 8 | 4 | 0 | 0 |
| B5 | 50 | 25 | 35 | 23.3 | 35 | 17.5 | 12 | 24 | 81 | 40.5 | 25 | 16.6 | 21 | 10.5 | 6 | 12 |
| B6 | 54 | 27 | 28 | 18.6 | 29 | 14.5 | 4 | 8 | 41 | 20.5 | 22 | 14.6 | 26 | 13 | 4 | 8 |
| C | 17 | 8.5 | 10 | 6.6 | 14 | 7 | 1 | 2 | 11 | 5.5 | 6 | 4 | 8 | 4 | 0 | 0 |
| E1 | 46 | 23 | 41 | 27.3 | 43 | 21.5 | 7 | 14 | 38 | 19 | 57 | 38 | 61 | 30.5 | 7 | 14 |
| E2 | 7 | 3.5 | 4 | 2.6 | 7 | 3.5 | 1 | 2 | 2 | 1 | 2 | 1.3 | 2 | 1 | 0 | 0 |
| E3 | 19 | 9.5 | 13 | 8.6 | 19 | 9.5 | 1 | 2 | 8 | 4 | 12 | 8 | 11 | 5.5 | 1 | 2 |
| F1 | 5 | 2.5 | 4 | 2.6 | 3 | 1.5 | 0 | 0 | 20 | 10 | 19 | 12.6 | 20 | 10 | 2 | 4 |
| F2 | 17 | 8.5 | 13 | 8.6 | 17 | 8.5 | 3 | 6 | 9 | 4.5 | 5 | 3.3 | 7 | 3.5 | 1 | 2 |
| F3 | 10 | 5 | 14 | 9.3 | 7 | 3.5 | 5 | 10 | 4 | 2 | 1 | 0.6 | 3 | 1.5 | 1 | 2 |
| G | 8 | 4 | 3 | 2 | 5 | 2.5 | 2 | 4 | 16 | 8 | 8 | 5.3 | 9 | 4.5 | 2 | 4 |
| H | 16 | 8 | 3 | 2 | 10 | 5 | 6 | 12 | 21 | 10.5 | 1 | 0.6 | 18 | 9 | 7 | 14 |
| I | 9 | 4.5 | 5 | 3.3 | 5 | 2.5 | 0 | 0 | 11 | 5.5 | 1 | 0.6 | 6 | 3 | 0 | 0 |
| J | 0 | 0 | 0 | 0 | 3 | 1.5 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0.5 | 0 | 0 |
| K | 3 | 1.5 | 5 | 3.3 | 14 | 7 | 11 | 22 | 15 | 7.5 | 8 | 5.3 | 24 | 12 | 23 | 46 |

Note: A. Ability; B. Effort (B1. Practising, B2. Listening, B3. Copying, B4. Thinking, B5. Speed to act and B6. Task execution); C. Task difficulty, E. Classroom behavior (E1. Focused, E2. Calm, E3. Silent); F. Influence of other educational agents (F1. Schoolmate, F2. Teacher and F3. Family); G. Mediational instruments; H. Physical and mental state; I. Task motivation; J. Imaginative excuse; and K. No answer

independent proportions. If significant, all 2 to 2 comparisons were made using the Bonferroni correction as an adjustment method for multiple contrasts.

It is observed how the attributional categories most frequently chosen by students to explain both success and failure are: Ability; Effort in the subcategory Speed to act and Task execution; Classroom behavior in the Focused sub-category; Physical and mental state and No answer. Likewise, in the category that refers to the Influence of other educational agents, students included the family as a cause of their successes and classmates as a justification for their academic failures.

*A comparison between Weiner's categorization and the new categorization provided in this study*

The students from 3 to 6 years contributed a total of 957 and 843 causal attributions to explain, respectively, school success and failure.

57% of the causal attributions for success and 45% of those relating to school failure correspond to the four categories that Weiner identified for adolescents and adults. This indicates that they are generated and are present among the Early Childhood Education population. However, the remaining 43% and 55% of the attributions for school success and failure, respectively, correspond to the six new categories proposed in this study.

In all the activities, the causal attributions of Weiner's categorization account for slightly more than half of school success. The rest are explained by the attributions of the new categorization, with a figure of over 40% (Table 4).

*Evolution of causal attributions*

A proportions comparison was made for the H0: *equal proportions in the 4 ages in all* activities for both success and failure.

After applying the Bonferroni correction on the new categories and sub-categories among the different ages, many are no longer significant. Significant differences are maintained in pairwise comparisons between different age groups in the following categories and sub-categories:

- Capacity: comparing students between 4 and 5 years old, the older ones use it more to explain school success ($p = .023$).
- Focused: between the students of 3 and 6 years and those of 4 and 6 years, it is the older students who use this sub-category the most to account for success ($p < .0001$; $p = .0138$) and school failure ($p = .003$; $p = .0123$).
- Task execution: between students of 4 and 5 years old, the older ones refer to this more to explain school success ($p = .023$).

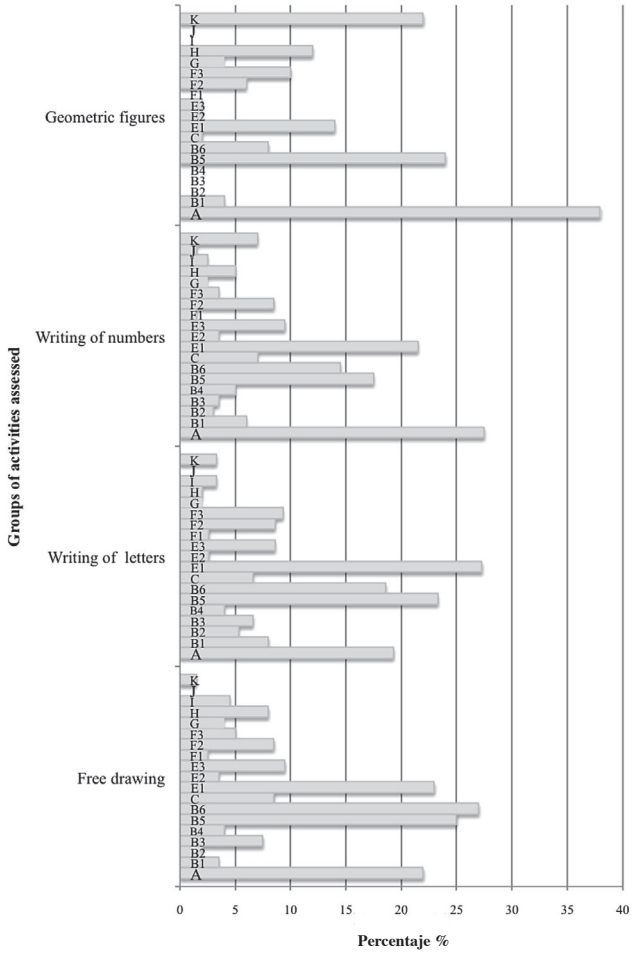


**Figure 1.** Causal attribution of school success for activity groups: Free drawing, Writing of numbers, Writing of letters and Geometric figures
Note. A. Ability; B. Effort (B1. Practising, B2. Listening, B3. Copying, B4. Thinking, B5. Speed to act and B6. Task execution); C. Task difficulty, E. Classroom behavior (E1. Focused, E2. Calm, E3. Quiet); F. Influence of other educational agents (F1. Schoolmate, F2. Teacher and F3. Family); G. Mediational instruments; H. Physical and mental state; I. Task motivation; J. Imaginative excuse; and K. No answer

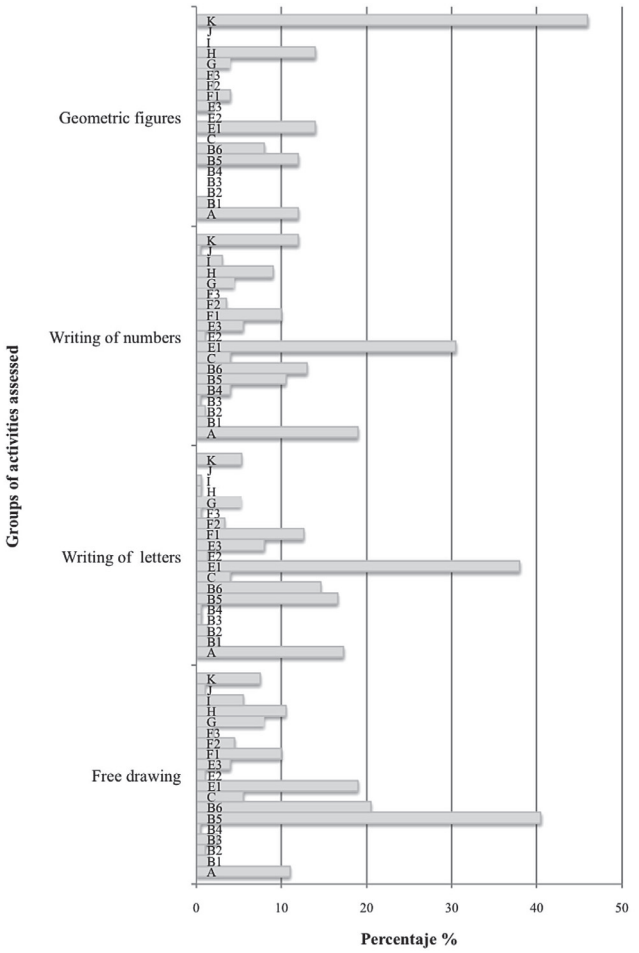


**Figure 2.** Causal attribution of school failure for activity groups: Free drawing, Writing of numbers, Writing of letters and Geometric figures
Note: A. Ability; B. Effort (B1. Practising, B2. Listening, B3. Copying, B4. Thinking, B5. Speed to act and B6. Task execution); C. Task difficulty, E. Classroom behavior (E1. Focused, E2. Calm, E3. Quiet); F. Influence of other educational agents (F1. Schoolmate, F2. Teacher and F3. Family); G. Mediational instruments; H. Physical and mental state; I. Task motivation; J. Imaginative excuse; and K. No answer

- Classmates: in all comparisons between different age groups, older students hold their classmates more frequently responsible for their school failures (p = .0336; p = .0084).
- Absence of response: the older the students are, the more likely they are to generate a causal attribution (p = .0174).

## Conclusions

By identifying the causes to which boys and girls (3, 4, 5 and 6 years) attribute their successes and failures in different school tasks, it was seen that there was a need to develop a new system of categorization of the causal attributions of school success and failure, which reviews and expands the one created by Weiner (1986). To a certain extent, Weiner acknowledged this fact by stating that "it seems that no study fully confirms the theory" (Weiner, 1992, p. 281). The new categorization system makes it possible to compare, check and organize information in a conceptual way. Starting with the four attributional categories that Weiner considered, these were expanded to ten.

*Table 4*
Comparison between Weiner's categorization and that provided by this research

| | | School success | | School failure | |
|---|---|---|---|---|---|
| **Activities** | **Categorizations** | **No. of explanations** | **%** | **No. of explanations** | **%** |
| Free drawing | Weiner | 199 | 59 | 166 | 53 |
| | New | 140 | 41 | 146 | 47 |
| Writing of letters | Weiner | 138 | 57 | 87 | 43 |
| | New | 105 | 43 | 114 | 57 |
| Writing of numbers | Weiner | 168 | 56 | 107 | 40 |
| | New | 133 | 44 | 162 | 60 |
| Geometric figures | Weiner | 38 | 51 | 17 | 28 |
| | New | 36 | 49 | 44 | 72 |
| Global | Weiner | 543 | 57 | 377 | 45 |
| | New | 414 | 43 | 466 | 55 |

The new system of causal attributions is composed of 10 categories and in some of them it was necessary to include sub-categories: Ability; Effort (Practising, Listening, Copying, Thinking, Speed to act and Task execution); Difficulty of task; Behavior in class (Focused, Calm and Silent); Influence of other educational agents (Classmate, Teacher and Family); Mediation instruments; Physical and mental state; Motivation regarding the task; Imaginative excuse; No answer (Table 1).

The "Luck" category could not be analyzed because there was not a sufficient number of responses attributable to this category, and it was finally eliminated for Early Childhood Education, although with other populations perhaps sufficient responses attributable to this category may be obtained.

It may be observed how the attributional categories chosen more frequently by the students are the same for their successes as for their failures, with no difference based on sex being perceived. The students justified their ability to cope with the task or not depending on whether the speed and execution of their actions during the task was a positive or negative influence, or how their concentration or fatigue was reflected in their academic results.

It can be seen how the likelihood of using causal attributions to justify success at school in terms of the ability to learn, effort and good behavior in class increases with age.

The students explained how their family had a positive influence on their results and how very often their classmates prevented them from completing the tasks successfully, thus blaming them for their poor school results. That is why studying causal attributions in Early Childhood Education helps to understand the influence of reference adults and their feedback, and how these can cause disparate motivational channels among different students.

Consequently, it is necessary to encourage a regulated socio-emotional development together with as real as possible an attributional refinement, despite the subjectivity and self-centeredness of Early Childhood Education students. Likewise, it is necessary to detect the external causal attributions and transform them into internal ones, providing students with the necessary mechanisms and tools to explain their academic results in a realistic way, so that they take responsibility for their own learning and academic performance.

The creation of this new system of categorization of causal attributions, although significantly different from that of Weiner, has made it possible for very significant information to be considered, and in this way it can be regarded as a valid alternative for the qualitative analysis of this construct for Early Childhood Education.

Finally, the sample, although difficult to obtain, has to be expanded and be more diverse (different cities, types of educational center, etc.), and it is proposed that interviews be conducted immediately after completion of the task to ensure more objective responses and ones which are appropriate to the activity assessed. All of this will allow the results to be more generalized.

In future research, the new categorization should observe how causal attributions evolve as the age of the student body increases; in this way it can be seen whether the trend detected in this study is also identified in other studies. This should be completed with an analysis of the attributional dimensions: internal / external locus of control, stability / instability and controllability / uncontrollability.

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