



Psychological Evaluation

## Evidence of criterion validity for the Causal Attribution Scale


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### Abstract

This paper reports the study of evidence of the validity of concurrent criterion to the Causal Attributions Assessment Scale for Basic Education (EAVAT-EF). The factors Causes for Success and Causes for Failure constitute the scale. Participated in this study 927 students (3rd to 9th grades,  $M_{age} = 11.59$ ,  $SD = 1.98$ ), mostly girls (53.9%), being 147 retained students. The results indicated the predisposition of Elementary School students to indicate the factor Causes for Success. The girls and non-repeating students scored higher on both EAVAT-EF factors. The Middle School students and the retained students by the criterion of school grade had a higher average in the factor Causes for Failure. As a discussion, we point to teaching-learning particularities between education levels, the possible impacts on causal attributions due to the interaction between the variables gender and repetition, as well as the interference of the disapproved criteria in students' attributions.

**Keywords:** motivation for learning; causal attributions; elementary school; grade retention; psychoeducational assessment.

## EVIDÊNCIAS DE VALIDADE DE CRITÉRIO PARA A ESCALA DE ATRIBUIÇÕES DE CAUSALIDADE

### Resumo

Este artigo reporta o estudo de evidências de validade de critério concorrente da Escala de Avaliação das Atribuições de Causalidade para Alunos do Ensino Fundamental (EAVAT-EF), constituída pelos fatores Causas para o Sucesso e Causas para o Fracasso. Responderam à escala 927 alunos (do terceiro ao nono ano;  $M_{idade} = 11,59$ ;  $DP = 1,98$ ), em maioria meninas (53,9%), sendo 147 repetentes. Os resultados indicaram a predisposição dos alunos do ensino fundamental I a indicar o fator Causas para o Sucesso. As médias das meninas e dos alunos não repetentes sobressaíram nos dois fatores da EAVAT-EF. Examinou-se que os alunos do ensino fundamental II e reprovados por ano escolar obtiveram pontuações mais elevadas no fator Causas para o Fracasso. São discutidas particularidades do ensino-aprendizagem entre os níveis de ensino, os possíveis impactos nas atribuições causais devido à interação entre as variáveis sexo e repetência, bem como a interferência dos critérios de reprovação nas crenças atribucionais.

**Palavras-chave:** motivação para aprendizagem; atribuições causais; ensino fundamental; repetência escolar; avaliação psicoeducacional.

## EVIDENCIAS DE VALIDEZ DE CRITERIO PARA LA ESCALA DE ATRIBUCIONES DE CAUSALIDAD

### Resumen

Este artículo reporta el estudio de evidencias de validez de criterio concurrente de la Escala de Evaluación de las Atribuciones de Causalidad para Alumnos de la Educación Básica (EAVAT-EF) – factores Causas para el Éxito (CE) y Causas para el Fracaso (CF). Participaron 927 alumnos del primer y segundo ciclo de la enseñanza fundamental (3º al 9º año,  $M_{\text{edad}} = 11,59$ ,  $DP = 1,98$ ) – mayoría niñas (53,9%), siendo 147 alumnos repitentes. Se identificó la predisposición del primer ciclo a indicar las CE. Las niñas y los alumnos sin historial de repetición se sobresalieron en la EAVAT-EF. Los alumnos del segundo ciclo y reprobados por año escolar, han sido mejores en las CF. Se discuten las particularidades de la enseñanza-aprendizaje entre los ciclos, los posibles impactos en las atribuciones causales debido a la interacción entre las variables sexo y repetencia, y la interferencia de los criterios de reprobación en las creencias atribucionales.

**Palabras clave:** motivación para el aprendizaje; atribuciones causales; enseñanza fundamental; repetición escolar; evaluación psicoeducativa.

### 1. Introduction

Within the scope of Psychological Assessment, it is indispensable to carry out studies aimed at the investigation of the psychometric properties of instruments intended for the measurement of psychological constructs, which is relevant for all areas of Psychology. The psychometric quality of these instruments depends on their evidence of validity, which lends support to the interpretations of their results, resulting from the accumulation of empirical studies obtained with their application in the context and audience for which they are intended (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). The present study aimed to examine the evidence of concurrent criteria validity for the Causal Attribution Scale for Elementary Education Students (Escala de Avaliação das Atribuições de Causalidade para Alunos do Ensino Fundamental – EAVAT-EF, Boruchovitch & Santos, 2013). The relevance of developing this study with the EAVAT-EF stems from the need to provide an instrument for evaluating attributions of intrapersonal causality compatible with the Brazilian educational reality. It should be noted that the EAVAT-EF presented good initial psychometric parameters, low

costs, and versatility of use, and can be applied individually or collectively (Boruchovitch & Santos, 2015).

The EAVAT-EF evaluates students' motivation for learning through Weiner's theory of intrapersonal attributions of causality, with a focus on the cognitive aspect (1985, 2010, 2018). This theory refers to students' judgment regarding the causes that justify their results of success and failure in the school. In the school context, four attributional causes predominate, the knowledge, the ability – also named by the students as intelligence –, the effort, the level of difficulty of the task, and luck (Weiner, 1985, 2010). The attributions to these causes interfere in the motivation of the students in an anticipatory way, that is to say, after recognizing the cause that led to a specific result (positive or negative), students tend to motivate or discourage themselves, which ends up affecting their actions (e.g., establishment of learning goals and objectives) (Bandura, 2001; Bzuneck, Boruchovitch, Miranda, & Almeida, 2014; Weiner, 1985, 2010).

The psychological sense of intrapersonal causal attribution comes from the student's perception of these four causes that, after being identified, are classified according to three theoretical dimensions – the locus of causality, the stability, and the controllability (Weiner, 2010, 2018). The locus of causality refers to the location of the cause – whether internal or external to the student. For Weiner (1985), the student's level of coping is connected to the cause's locus that leads to a negative result. Stability underlies the temporal variability of the cause. The ability, for example, is regarded as a stable cause, as it tends to undergo few changes over time, and effort is classified as an unstable cause and therefore more likely to be modified. Finally, controllability refers to the notion that the student has or does not have control over the cause that led to the result of school success or failure (Weiner, 2010, 2018).

The cognitive aspect of attributions of intrapersonal causality is at the same time a motivator and a regulator of student behavior by acting on the establishment of previously expected goals and outcomes, similar to what was experienced in the past (Bandura, 2001; Weiner, 1985, 2010). Attributions of causality adaptively operate when they favor the student avoiding negative results and maintaining positive results, and in a maladaptive way, if they prevent the reversal of the results of failure and the appearance of good results (Weiner, 2010).

The EAVAT-EF evaluates two theoretical dimensions of the attributions of intrapersonal causality – the causal locus and the controllability. The EAVAT-EF

scale expands the number of causes identified in Weiner's studies (1985, 2010), since its construction was also based on the results of empirical studies conducted with Brazilian students. The division of the EAVAT-EF into two factors (Causes for Success and Causes for Failure) is based on the self-serving tendency. From this perspective, the attributions of external causal locus with a lower level of control are related to the predisposition of students to protect their self-concept and self-esteem; and the attributions of internal causal locus with a higher level of control denote the student's accountability for his or her positive or negative school results (Boruchovitch & Santos, 2015).

Literature review studies and empirical research indicate the contrast existing in the attributions of intrapersonal causality verified in the different levels of education. The students of the first school years tend to present greater difficulty in distinguishing the attributions of causality, as is the case of the effort that ends up being perceived as a cause analogous to the ability (Almeida & Guisande, 2010), which may justify the decrease in the attribution related to this latter cause for success/failure in the final years of basic education (Swinton, Kurtz-Costes, Rowley, & Okeke-Adeyanju, 2011). With the advance of the school years, students develop a more precise notion of self-regulation when indicating the attributions of internal and controllable causal locus, as is the case with the effort. This cause also begins to be perceived as a different cause to ability (Shell, Colvin, & Bruning, 1995). Another effect of schooling is the increase in the number of cases presented by students during the school years (Neves & Farias, 2007). In the final years of elementary school, the student begins to indicate fewer efforts to explain success situations, due to the use of other attributions of internal and controllable causal locus, as is the case of using suitable study methods (Almeida, Miranda, & Guisande, 2008). Similarly, Almeida et al. (2008) and Swinton et al. (2011) also found less mention of ability to explain failure in students of more advanced school years.

Regarding the differences in attributions of intrapersonal causality in relation to the gender, empirical studies have shown that, compared to girls, boys of Brazilian, Portuguese, and American primary education presented attributions of external and uncontrollable causal locus, especially to justify failure (e.g., the difficulty of the task) (Almeida et al., 2008; Boruchovitch, 2004; Powers & Wagner, 1984; Ryckman & Peckham, 1987). Alongside this attributional pattern, Powers and Wagner (1984) examined the lack of interest of male Middle School students, cou-

pled with the lower competence and efficiency in performing school tasks. As identified by Martini and Del Prette (2005), boys presented more significant difficulties than girls in indicating attributions of causality to justify their school results. Another aspect that has been verified in studies is the higher incidence of the attribution of school failure situations to the lack of ability in girls (Dickhäuser & Meyer, 2006; Licht, Stader, & Swenson, 1989; Lohbeck, Grube, & Moschner, 2017). Accordingly, when compared to boys, girls tended to attribute ability less to explain school success (Dickhäuser & Meyer, 2006). However, the girls that participated in the study by Newman and Stevenson (2014) had a more significant understanding of the meaning of the attribution of ability than boys.

Regarding the functioning of the attributions of causality due to the history of repetition, the literature indicates the tendency of the repeating students to present attributions of the external causal locus with a lower level of control for the situations of success in the school, associated with the difficulties of perception regarding their merits. These students also often negatively interpret the results of failure, in the sense of feeling guilty about these situations (Almeida & Guisande, 2010; Paiva & Boruchovitch, 2010). This type of thinking can lead to the presentation of feelings of frustration and is linked to the student's lack of motivation to learn (Almeida & Guisande, 2010; Nuñez et al., 2005; Schwerdt, West, & Winters, 2017). Fernandes, Lemes, Elias, and Soares (2018) corroborate these assertions, indicating that more repetitions negatively compromise the students' perception of their future expectations (e.g., possibility of enrollment in Higher Education), especially at the end of Middle School.

Empirical studies aimed at conferring differences in the attributions of causality of repeating students shows that they hold more maladaptive attributional beliefs than students with no history of repetition. An example of this is the study by Paiva and Boruchovitch (2010) with students of Elementary and Middle School. The authors identified that the repeating students classified intelligence as an attribution of external and unstable causal locus and luck as an attribution of an internal causal locus. In a later study, Garcia and Boruchovitch (2015) identified the predisposition of repeating students to endorse attributions of causality directed toward school failure (e.g., low ability), while students with no history of repetition predominantly chose attributions of causality for the results of school success.

Since the schools participating in the present study presented different criteria for repeating the year, the specific aim of this investigation was to compare possible differences in the factors of the EAVAT-EF according to repetition due to the continued progression criterion and due to the school year criterion. The system of continued progression presupposes that the student will not repeat the year if he/she has developed the necessary skills and knowledge to attend the subsequent school year (Barretto & Sousa, 2004; Brasil, 2006). In order to measure the level of learning, this system uses formative evaluation, which seeks to measure what the learner has learned throughout the school year and to identify the points that must be improved (Brasil, 2006; Nunes & Leite, 2017). In the formative evaluation, low income is not seen as a sign of the student's inability (Nunes & Leite, 2017). In the system of repetition by school year, assessments are applied in order to classify students into a quantitative system of grades. Repetition happens due to the presentation of unsatisfactory performance by the student, which results in the student remaining in the same school year (Brasil, 2006; Nunes & Leite, 2017). Although these criteria were not examined in this study aiming to provide evidence of concurrent criteria validity for the EAVAT-EF, it is recognized that they constitute an essential aspect to be considered in the analysis of the impact of the history of repetition for the attributions of intrapersonal causality, due to the differences adopted in these systems regarding the forms of evaluation and of providing students with performance feedback (Brasil, 2006), which may also affect the motivation for learning (Bzuneck et al., 2014).

The aim of conferring the evidence of concurrent criterion validity for the EAVAT-EF was based on the theoretical interpretations and empirical studies mentioned above, which established the formulation of some guiding hypotheses for the present investigation regarding the levels of education, the gender and the history of repetition. It was conjectured that the students of Middle School, girls, and non-repeating students would present higher means in the EAVAT-EF factors when compared, respectively, with boys and repeating students of Elementary School. Regarding the repetition criteria, it was assumed that students repeating due to continued progression would tend to have a higher mean in the EAVAT-EF Causes for Success factor, and students repeating due to school year would have higher scores in the Causes for Failure factor.

## 2. Method

### 2.1 Participants

A total of 927 students from seven public schools located in the state of São Paulo participated in this study. The sample consisted of 372 Elementary School students (3rd to 5th year), aged from 8 to 16 years old ( $M = 9.66$ ,  $SD = 1.14$ ), the majority of whom were girls ( $n = 196$ ; 52.7%). Of these students, 43 had a history of repetition, with 38 of them having repeated once; 5, twice; and 1, three times. Middle School students in the 6th to 9th years also participated, with ages varying from 11 to 17 ( $M = 12.88$ ;  $SD = 1.25$ ), with 54.7% being girls ( $n = 307$ ). Of these students, 104 were repeating a year – 72 having repeated once; 23, twice and 7, three times. Regarding the criterion of repetition, 82 were repeating due to the school year and 65 due to cycle.

### 2.2 Instrument

Causal Attribution Scale for Elementary Education Students (*Escala de Avaliação das Atribuições de Causalidade para Alunos do Ensino Fundamental*, EAVAT-EF; Boruchovitch & Santos, 2013): The instrument evaluates the attributions of intra-personal causality of students in basic education – Elementary and Middle School. It contains 35 items, divided into two factors – factor 1, Causes for Success, composed of 17 items (Example item: “I get good grades because I’m intelligent”) and factor 2, Causes for Failure, with 18 items (Example item: “I do badly at school because the teacher does not like me”). The EAVAT-EF response format is a three-point Likert-type scale (1 = “never”, 2 = “sometimes” and 3 = “always”). The scale can be applied individually or collectively, in its pencil and paper version, with an average response time of 15 minutes. For the correction of the EAVAT-EF, all items of the Causes for Failure factor must be reversed. Since the factors have a different number of items, in the correction, the mean value 1.5 is adopted as the reference and, when necessary, the standard deviation values are also analyzed. Based on this mean value for the interpretation of the scores, it is established that high scores in both EAVAT-EF factors represent attributions of an internal causal locus with a higher level of control by the student, while low scores suggest attributions of an external causal locus with a lower level of control. The causes evaluated in the EAVAT-EF refer to good/bad behavior, paying attention in class or not, being calm



or not in situations of tests, making an effort or not, aspects of the teacher (whether or not he/she likes the student and his/her teaching abilities), level of difficulty of the task, good/bad luck in the school, being studious or not and having support from classmates and family or not. Regarding the psychometric properties, the EAVAT-EF presented satisfactory reliability estimates according to the internal consistency indexes (alpha coefficient), reported in the study by Boruchovitch and Santos (2015) – Factor 1,  $\alpha = 0.92$ ; Factor 2,  $\alpha = 0.83$ . For the sample of the present study, the alpha coefficient (factor 1,  $\alpha = 0.83$ , factor 2,  $\alpha = 0.82$ ) and the omega coefficient (both factors,  $\Omega = 0.85$ ) were investigated.

### 2.3 Data collection procedure

After the authorization of the Education Departments and the participating schools, as well as the approval of the project by the Research Ethics Committee of the university to which it is linked (CAAE: 73412917.6.0000.5514), the consent forms for the parents/guardians were issued and collected, as recommended by Resolution CNS 510/2016 of the National Health Council (Brasil, 2016) for research with human subjects. The EAVAT-EF was applied collectively in the classroom with the students who brought the consent form signed by their parents/guardians, with those who were 12 years of age or more reading and signing an assent form before answering the instrument. Data collection lasted an average of 15 minutes. The information about the repetition criteria was obtained from the secretaries of each school.

### 2.4 Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) – version 22.0 program. Descriptive analyses were used to characterize the sample. The analysis of the normality of the data verified the values of kurtosis and asymmetry of the variables to be analyzed, which were around 0, which made it feasible to use parametric analyses (Field, 2009). Student's *t*-test, ANOVA variance analysis, and two-way MANOVA variance analysis were used for the comparison of the groups. Cohen's *d* was used to verify the size of the statistical effect on the variables relative to the education levels, gender, repetition history, and repetition criteria. The interpretation parameters of Cohen's *d* were based on Cohen (1992) –  $d = 0.20$ , small effect;  $d < \text{or} = 0.50$ , medium effect;  $d < \text{or} =$

0.80, large effect. The interpretation of the alpha and omega coefficients followed, respectively, the guidelines of Urbina (2007) and Ventura-León and Caycho-Rodríguez (2017).

### 3. Results

In order to investigate the evidence of concurrent criterion validity for the EAVAT-EF, the differentiation in the scores of its factors were examined regarding education levels, gender, and history of repetition. The size of the statistical effect was also verified for the indices of each criterion variable. Table 3.1 presents the results of Student's *t*-test and Cohen's *d* for the education levels concurrent criterion variable.

Table 3.1. Student's *t*-test and Cohen's *d* for the EAVAT-EF Factors and the Education Levels.

EAVAT-EF Factors (Dependent Variable)	Education Levels (Independent Variable)	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Causes for Success	Elementary School	373	2.33	0.333	6.026	< 0.001	0.40
	Middle School	562	2.20	0.326			
Causes for Failure	Elementary School	373	2.55	0.334	-0.314	0.700	-0.02
	Middle School	562	2.56	0.294			

The results of Table 3.1 indicated the existence of statistically significant differences only for the Causes for Success factor of the EAVAT-EF between the education levels. To explore these differences, scores on the Causes for Success factor for each school year were compared. This can be seen in Figure 3.1, generated from the ANOVA analysis of variance, in which the value obtained was  $F = 7.35$  (6, 929);  $p < 0.001$ .

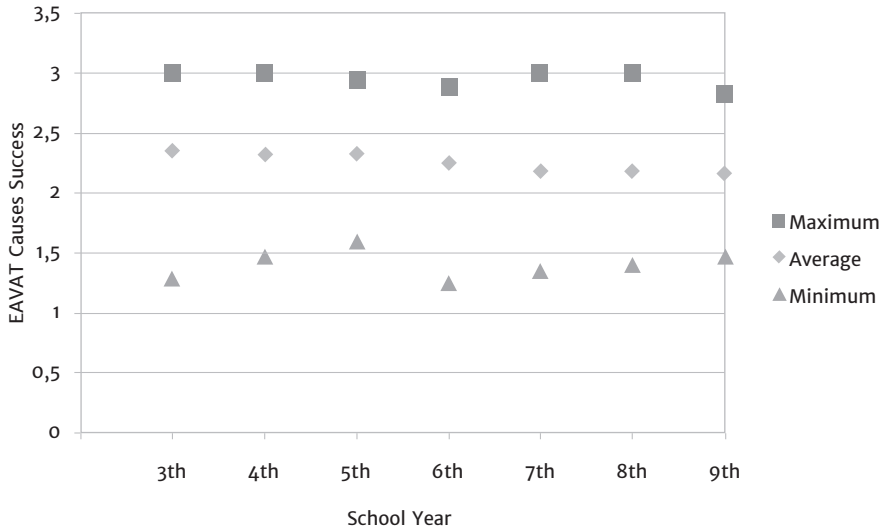


Figure 3.1. Distribution of the Causes for Success factor scores based on the school years.

Figure 3.1 shows that there was a decrease in the EAVAT-EF Causes for Success factor scores as the school years progressed. It should be highlighted that the 3rd year had a higher score in this factor when compared to the 9th year. Table 3.2 below shows the results of Student’s *t*-test and Cohen’s *d* for the EAVAT-EF concerning the gender concurrent criterion variable, for both the general sample and for each education level.

Table 3.2 shows that for both the general sample and for each education level, girls presented a higher mean in both EAVAT-EF factors (except for Elementary School, in the Causes for Failure factor, which did not present statistical significance). Based on the logic of the scale’s operation, it is conjectured that the girls, in comparison to the boys, presented more attributions of an internal and controllable causal locus for school failure and success situations. The effect of the statistical significance measured by Cohen’s *d* was small for the general sample and the levels of education. The existence of possible interaction of the variables gender and school year was also verified through the two-way MANOVA (2 groups – gender and levels of education). The interaction between these variables did not

present statistical significance for the Causes for Success factor,  $F = 0.001 (1, 934)$ ;  $p = 1.0$ ; nor for the Causes for Failure factor,  $F = 0.159 (1, 934)$ ;  $p = 0.7$ . Table 3.3 presents the results of Student's  $t$ -test and Cohen's  $d$  for the history of repetition concurrent criterion variable.

**Table 3.2. Student's  $t$ -test and Cohen's  $d$  for the EAVAT-EF Factors and the Gender Criterion Variable.**

	<b>EAVAT-EF Factors</b>	<b>Gender</b>	<b><math>n</math></b>	<b><math>M</math></b>	<b><math>SD</math></b>	<b><math>t</math></b>	<b><math>p</math></b>	<b>Cohen's <math>d</math></b>
General Sample	Causes for Success	Boys	431	2.22	0.334	-3.00	0.003	-0.2
	Causes for Success	Girls	504	2.28	0.333			
	Causes for Failure	Boys	431	2.52	0.318	-3.62	< 0.001	-0.2
	Causes for Failure	Girls	504	2.59	0.300			
Elementary School	Causes for Success	Boys	176	2.30	0.341	-1.98	0.050	-0.2
	Causes for Success	Girls	197	2.36	0.323	-1.83	0.060	-0.2
	Causes for Failure	Boys	176	2.52	0.324			
	Causes for Failure	Girls	197	2.58	0.341			
Middle School	Causes for Success	Boys	255	2.16	0.318	-2.48	0.010	-0.2
	Causes for Success	Girls	307	2.23	0.330	-3.22	0.001	-0.3
	Causes for Failure	Boys	255	2.52	0.315			
	Causes for Failure	Girls	307	2.60	0.271			

**Table 3.3. Student's  $t$ -test and Cohen's  $d$  for the EAVAT-EF Factors and the History of Repetition Criterion Variable.**

	<b>EAVAT-EF Factors</b>	<b>Repetition History</b>	<b><math>n</math></b>	<b><math>M</math></b>	<b><math>SD</math></b>	<b><math>t</math></b>	<b><math>p</math></b>	<b>Cohen's <math>d</math></b>
General Sample	Causes for Success	Repeaters	147	2.12	0.311	-5.36	< 0.001	-0.5
	Causes for Success	Non-repeaters	788	2.28	0.334			
	Causes for Failure	Repeaters	147	2.46	0.298	-4.25	< 0.001	-0.4
	Causes for Failure	Non-repeaters	788	2.58	0.310			
Elementary School	Causes for Success	Repeaters	43	2.18	0.289	-3.15	0.002	-0.5
	Causes for Success	Non-repeaters	330	2.35	0.334	-4.15	< 0.001	-0.7
	Causes for Failure	Repeaters	43	2.36	0.371			
	Causes for Failure	Non-repeaters	330	2.58	0.321			
Middle School	Causes for Success	Repeaters	104	2.09	0.317	-3.78	< 0.001	-0.4
	Causes for Success	Non-repeaters	458	2.22	0.323	-2.36	0.020	-0.2
	Causes for Failure	Repeaters	104	2.50	0.252			
	Causes for Failure	Non-repeaters	458	2.57	0.302			

The indices reported in Table 3.3 indicate that students with no history of repetition obtained higher means in both the factors of the EAVAT-EF – general sample and in each education level. When compared with the repeating students, those who did not have a history of repetition tended to present attributions of more internal and controllable causal locus, which indicates their greater accountability for situations of school success and failure. Table 3.3 also shows that the size of the statistical effect generated by Cohen's  $d$  varied between small, medium, and large. In addition, the two-way MANOVA (2 groups – history of repetition and education levels) was applied to investigate the interaction between the variables of repetition and levels of education for the EAVAT-EF – Causes for Success factor,  $F = 0.318$  (1, 932);  $p > 0.5$ ; and Causes for Failure factor,  $F = 5.911$  (1, 932);  $p < 0.02$ . These indices indicate the existence of a statistically significant interaction between the variables of repetition and levels of education in the Causes for Failure factor.

Therefore, it was found that a large part of the sample of repeating students ( $n = 147$ ) was composed of boys ( $n = 99$ ), with  $n = 29$  of Elementary School and  $n = 70$  of Middle School. Therefore, the students' performance in the EAVAT-EF was analyzed through the multivariate analysis of the two-way MANOVA variance (2 groups – gender and history of repetition) from the interaction between the gender and history of repetition variables. The Causes for Success factor obtained  $F = 8.172$  (5, 927) value and the Causes for Failure factor,  $F = 5.374$  (5, 927), both with  $p < 0.001$ . The repeating boys had lower means in the two factors of the EAVAT-EF – Causes for Success,  $M = 2.11$  ( $SD = 0.29$ ); Causes for Failure,  $M = 2.43$ , ( $SD = 0.30$ ), followed by the repeating girls – Causes for Success factor,  $M = 2.14$  ( $SD = 0.35$ ); Causes for Failure factor,  $M = 2.51$ , ( $SD = 0.29$ ). Among the non-repeating students, the boys also presented a lower mean in the EAVAT-EF (Causes for Success factor,  $M = 2.25$ ,  $SD = 0.34$ , Causes for Failure factor,  $M = 2.54$ ,  $SD = 0.32$ ) compared to the girls (Causes for Success factor,  $M = 2.30$ ,  $SD = 0.33$ , Causes for Failure factor,  $M = 2.60$ ,  $SD = 0.30$ ), however, they stood out compared to the repeating students.

The interference of the interactions of the gender criterion variables and the history of repetition in the EAVAT-EF was maintained when analyzing the levels of education separately. For those of Elementary School, the value  $F = 4.209$  (3, 369),  $p = 0.006$ , was identified in the Causes for Success factor of the EAVAT-EF and

$F = 6.300 (3, 369)$ ,  $p < 0.001$  in the Causes for Failure factor; and for Middle School,  $F = 5.806 (3, 558)$ ,  $p = 0.001$  in the Causes for Success factor and  $F = 4.444 (3, 558)$ ,  $p = 0.004$  in the Causes for Failure factor.

Finally, the possible differences in the EAVAT-EF scores were verified considering the students' repetition criteria – by school year and by continued progression. The results are presented in Table 3.4.

**Table 3.4.** Student's *t*-test and Cohen's *d* for the EAVAT-EF Factors and the Repetition Criteria considering the Education Levels.

	<b>EAVAT-EF Factors</b>	<b>Repetition Criteria</b>	<b><i>n</i></b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>t</i></b>	<b><i>p</i></b>	<b>Cohen's <i>d</i></b>
Elementary School	Causes for Success	Continued Progression	22	2.17	0.324	-0.222	0.800	-0.1
	Causes for Success	School Year	21	2.19	0.254			
	Causes for Failure	Continued Progression	22	2.31	0.362	-0.860	0.400	-0.3
	Causes for Failure	School Year	21	2.41	0.383			
Middle School	Causes for Success	Continued Progression	43	2.07	0.302	-0.565	0.600	-0.1
	Causes for Success	School Year	61	2.11	0.329			
	Causes for Failure	Continued Progression	43	2.39	0.234	-4.138	< 0.001	-0.8
	Causes for Failure	School Year	61	2.58	0.235			

Table 3.4 demonstrates the existence of a statistically significant difference only for the Causes for Failure factor in the sample of Middle School students. The students that repeated due to the school year criterion presented a higher mean in this factor compared to those who repeated due to the continued progression criterion. Cohen's *d* indicated a large statistical significance effect.

#### 4. Discussion

Given the results obtained, it is considered that the present study achieved its objective of providing evidence of concurrent criterion validity for the EAVAT-EF. When addressing the education levels, distinctions were verified between Elementary and Middle School only in the Causes for Success factor of the EAVAT-EF. Contrary to the initial hypothesis, in which a higher mean in this factor was ex-

pected for students in Middle School, the scores of the students in Elementary School stood out. It is assumed that this result arises due to the impact of the differences in the configuration of the political-pedagogical project of both education levels. Elementary School has a lower level of requirements related to the evaluation (e.g., need for high scores) and the activities evaluated are more diverse and playful in comparison to the tests applied in Middle School, which prioritizes closed questions delimited by each discipline (Brasil, 2017, Fernandes et al., 2018).

Regarding this result, the possible limitations of the younger children that make up the students of Elementary School should also be considered, regarding both their comprehension and their differentiation of attributions of intrapersonal causality (Almeida & Guisande, 2010). This may have interfered with the responses given to the Causes for Success factor, due to an overestimation of the attributions of causality by these students in school success situations. However, similar to what occurred in the present study, Swinton et al. (2011) found a drop in the attribution of internal locus causes, such as ability, in the final years of fundamental education. It should also be noted that there were no distinctions in the attributions of intrapersonal causality measured by the EAVAT-EF Causes for Failure factor concerning the education levels. It is assumed that the differences in this factor are not related to the specificities of Elementary and Middle School, but rather to other variables that were evaluated in this study, as is the case of the interaction identified between the history of repetition and the education levels in the EAVAT-EF Causes for Failure factor.

Regarding the differences in the EAVAT-EF scores for the gender criterion variable, the girls presented higher means in both factors of the scale. Similar results have been reported in studies that have identified the tendency of girls to present attributions of causality for situations of school success and failure to internal and controllable causal locus (e.g., effort, see Ryckman & Peckham, 1987), as well as internal and uncontrollable causal locus (e.g. ability, see Boruchovitch, 2004; Lohbeck et al., 2017; Newman & Stevenson, 2014; Ryckman & Peckham, 1987).

Regarding the historical repetition criterion variable, the repeating students presented lower means in the two factors of the EAVAT-EF. In this scenario, interference in the attributions of causality of the repeating students to situations of success/failure, especially those that had repeated several years, may have had repercussions for the presentation of attributions of external causal locus and with a

lower level of control due to successive experiences of negative school results (Paiva & Boruchovitch, 2010; Schwerdt et al., 2017). These results are consistent with those of studies comparing the attributions of causality of repeating and non-repeating students with respect to the identification of less functional beliefs for learning on behalf of the repeating students (Paiva & Boruchovitch, 2010), as well as their pre-disposition to indicate the Causes for Failure factor (Garcia & Boruchovitch, 2015).

It is pertinent to point out that, as verified in the present study, the differences between the genders in the factors of the EAVAT-EF may also have occurred due to the interaction of this criterion variable with the history of repetition. The results observed in the Causes for Failure factor, in which the scores of the boys and the repeating students were lower compared to the scores of the girls and the non-repeating students, may be associated with an ego-defensive posture. This behavior is identified in students who intentionally use external and uncontrollable causal locus justifications to protect their self-concept and self-esteem (e.g., make the teacher responsible for their school failure) (Almeida & Guisande, 2010; Bzuneck et al., 2014). Another possibility to be considered in the lower scores in the EAVAT-EF of the male and repeating students is the presentation of the profile of learned helplessness. In this case, the attributions of external and uncontrollable causal locus are not signaled by the deliberate protection of the self-concept, but rather by a dysfunctional perception of the student's inability, which is often not compatible with his/her objective reality, but which affects, for example, his/her notion of control over school success and failure results (Nuñez et al., 2005).

Complementary to the meanings about the interaction between the criterion variables of gender and the history of repetition, a greater sense of responsibility for the school results is indicated by girls and students with no history of repetition, especially in the Causes for Failure factor. In this sense, the attributions of internal and controllable causal locus aimed at explaining the results of school failure may lead the student to develop more effective strategies and, through the encouragement of teachers and close associates, the student can strive more in similar situations, which assists in the maintenance of motivation for learning (Almeida & Guisande, 2010; Bzuneck et al., 2014; Weiner, 2018).

In emphasizing the history of repetition, the differences in the scores of the Causes for Failure were also considered concerning the repetition criteria adopted by the schools. There was a tendency for students of Middle School and those re-



peating due to the school year criterion to score more in this factor than those who were repeating due to the continued progression criterion. Results of studies carried out in the Brazilian educational context that sought to ascertain the viability of the repetition criteria do not yet converge into a response to, for example, which system is most effective for quality learning (Barretto & Sousa, 2004; Nunes & Leite, 2017). Compatible with this data, a gap in studies on the impact of the repetition criteria on student motivation was also identified. The lack of studies on this topic restricts the perspectives of discussion of the results obtained in this study. However, by focusing on the evaluation systems provided for in each repetition criterion, it is assumed that the repetition due to school year exerts more significant pressure on students to achieve high grades. Therefore, this repetition criterion could justify the greater responsabilization of the student, more precisely in the sense of blame for school failure (Nunes & Leite, 2017).

The limitations of this study are added to the aspects that should be better investigated in future studies with the EAVAT-EF, both for the expansion of its evidence of validity and for the development of knowledge about the functioning of attributions of intrapersonal causality within the scope of Brazilian primary education. To investigate the repercussion of the attributions of interpersonal causality, especially of the teachers, in the formation of students' attributional beliefs; the addition of factors in the EAVAT-EF with the aim of evaluating the affective part of the construct; and the convergence of the EAVAT-EF factors with other motivational constructs (e.g., theory of self-determination and self-efficacy) are topics for a future research agenda. Regarding the sample, it is believed that the inclusion of students from other regions of Brazil, of students from private educational institutions and the application of the EAVAT-EF in High School, will allow the evaluation and the expanded view on the functioning of the attributions of causality throughout primary education.

In practical terms, the results of this study make an instrument with suitable psychometric parameters available to professionals of Psychology and Education, which can help them to understand the attributions of causality for school success and failure of the students. With this, it is hoped to favor the improvement of pedagogical practices, especially those that depend on the establishment of reinforcing or punitive contingencies, with attention to the kind of attributional beliefs that they can propitiate. Also, it may contribute to the elaboration of

intervention programs focused on the deconstruction of maladaptive attributional beliefs, which can lead to the student's demotivation, aiming to establish more functional attributions of causality. It is important to emphasize that the school must combine the stimulation of the cognitive aspects with more considerable attention to the motivational quality of the students, both associated with learning and school success.

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