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# High school motivation: Achievement goals and learning strategies

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### Abstract

The objective was to characterize the level of motivation to learn in terms of its orientations to achievement goals and the use of learning strategies in high school students, as well as to correlate the subscales of the instruments and to analyze differences considering sex and school year. We also sought to identify whether the motivation to learn can predict learning strategies. The Learning Motivation Scale and the Learning Strategies Assessment Scale were used on 261 private school students in Bahia, with a minimum age of 14 years and a maximum of 22 ( $M = 16.6$ ,  $SD = 1.4$ ). The results revealed that the students were more oriented towards the goal of learning and make use of metacognitive strategies. The prediction ratio indicated explanatory models with variance from 6% to 33%. It is suggested that investigations continue to broaden the understanding of the relationships between these variables.

**Keywords:** education; basic education; learning strategies; achievement goals; motivation.

## MOTIVAÇÃO NO ENSINO MÉDIO: METAS DE REALIZAÇÃO E ESTRATÉGIAS DE APRENDIZAGEM

### Resumo

Objetivou-se caracterizar o nível de motivação para aprender em termos de suas orientações a metas de realização e o emprego das estratégias de aprendizagem em alunos do ensino médio, bem como correlacionar as subescalas dos instrumentos e analisar diferenças considerando sexo e ano escolar. Buscou-se ainda identificar se a motivação para aprender pode prever as estratégias de aprendizagem. Empregaram-se a Escala de Motivação para Aprendizagem e a Escala de Avaliação das Estratégias de Aprendizagem em 261 estudantes do ensino particular da Bahia, sendo a idade mínima 14 anos e a máxima 22 ( $M = 16,6$ ,  $DP = 1,4$ ). Os resultados revelaram que os estudantes se mostraram mais orientados pela meta aprender e fazem uso das estratégias metacognitivas. A relação de predição indicou modelos explicativos com variância de 6% a 33%. Sugere-se a continuidade das investigações a fim de se ampliar o entendimento acerca das relações existentes entre essas variáveis.

**Palavras-chave:** educação; ensino básico; estratégias de aprendizagem; metas de realização; motivação.

# MOTIVACIÓN DE LA ESCUELA SECUNDARIA: OBJETIVOS DE LOGRO Y ESTRATEGIAS DE APRENDIZAJE

## Resumen

El objetivo fue caracterizar el nivel de motivación para aprender en términos de sus orientaciones a los objetivos de logro y el uso de estrategias de aprendizaje en estudiantes de secundaria, así como correlacionar las subescalas de los instrumentos y analizar las diferencias considerando el sexo y el año escolar. También buscamos identificar si la motivación para aprender puede predecir estrategias de aprendizaje. La Escala de Motivación de Aprendizaje y la Escala de Evaluación de Estrategias de Aprendizaje se usaron en 261 estudiantes de escuelas privadas en Bahía, con una edad mínima de 14 años y un máximo de 22 ( $M = 16,6$ ,  $DE = 1,4$ ). Los resultados revelaron que los estudiantes estaban más orientados hacia el objetivo de aprender y utilizar estrategias metacognitivas. El índice de predicción indicó modelos explicativos con una varianza del 6% al 33%. Se sugiere continuar las investigaciones para ampliar la comprensión sobre las relaciones entre estas variables.

**Palavras clave:** educación; enseñanza básica; estrategias de aprendizaje; objetivos de logro; motivación.

## 1. Introduction

Learning in the school context is mediated by various factors that greatly exceed the students' cognitive abilities (Lemos et al., 2010). These factors include motivation, a construct that has aroused the curiosity of many researchers to investigate the relationship between motivation and learning (Alcará & Santos, 2013; Albuquerque, Batista, Albuquerque, Oliveira, & Pereira, 2016; Beluce & Oliveira, 2016; Castro, Miranda, & Leal, 2016; Elliot & Murayama, 2008; Ferraz, Cantalice, & Santos, 2019; Maieski, Oliveira, Beluce, & Rufini, 2017; Oliveira, Santos, & Inácio, 2017; Santos, Moraes, & Lima, 2018; among others).

Among the main socio-cognitive theories dealing with motivation to learn is the Achievement Goals Theory (Elliott & Dweck, 1988), which explains students' motivational orientation to pursue academic goals. Hence, goals are directly linked to an individual's behavioral pattern when performing tasks, which is divided into three components: mastery goals, performance-approach goals, and performance-avoidance goals. This framework was adopted in this study because the measurement instrument used here is based on these three components. A framework, however, is reported in the literature in which Achievement Goals are subdivided into four

components, two for the mastery goal, and two for the performance goal, as reported by Elliot and McGregor (2001).

A student with a mastery-oriented goal focuses on the learning process, on mastering content, and performing tasks. These students are more interested in absorbing content and remain focused on developing skills and creativity and are more likely to use appropriate strategies to achieve their objectives (Bzuneck & Boruchovitch, 2016). Students characterized by performance-approach goals are those who feel the need to stand out among their peers as more intelligent, without, however, primarily focusing on effective learning while students with a performance-avoidance goal are primarily concerned with not being depreciated by teachers and peers and not looking incompetent (Senko & Hulleman, 2013; Zenorini & Santos, 2010).

When the focus is on achievement goals, another construct that appears recurrently concerns learning strategies. The literature has shown that the use of learning strategies is conditioned to various factors, many of which of a motivational nature (Alcará & Santos, 2013; Greene, Miller, Crowson, Duke, & Akey, 2004; Perassinoto, Boruchovitch, & Bzuneck, 2013). As Zenorini and Santos (2010) note, the use of learning strategies is a task that demands effort and persistence, which, therefore, requires an appropriate motivational pattern. Hence, students may master strategies but not use them for lack of motivation.

Learning strategies are defined as the students' mental and behavioral actions during the learning process and which facilitate recovering previously acquired knowledge (Dembo, 1994; Weinstein & Mayer, 1983). These strategies are essential because they provide the support necessary to achieve satisfactory academic performance (Prates, Lima, & Ciasca, 2016). The use of strategies enables students to store and retrieve information efficiently, so that students need to be familiar with such strategies and know how to use them properly (Lima & Santos, 2016; Oliveira et al., 2017).

Strategies may be analyzed from two perspectives, cognitive and metacognitive. Cognitive strategies consist of organizing, developing, and integrating information, while metacognitive strategies involve planning, monitoring, regulating one's thinking, and keeping an internal state that is conducive to learning. Thus, these are related to the way an individual analytically perceives the parts to understand the whole. Metacognitive strategies are more complex because they are related to a level

of awareness that is necessary to perform a task with the ability to think about one's thoughts, involving planning, regulating, controlling, and executing (Dembo, 1994; Perassinoto et al., 2013; Suehiro, Boruchovitch, & Schelini, 2018).

Brazilian studies seldom address motivation to learn and learning strategies simultaneously, especially among high school students. There is a consensual perception in the Brazilian educational system that this stage is permeated by many contradictions, considering difficulties individuals face accessing and remaining in school, and the quality of the education provided (Ferreira & Silva, 2017; Inácio, 2018; Krawczyk, 2011).

Often, studies investigating this subject address other educational stages such as primary school (Costa & Boruchovitch, 2015; Ferraz et al., 2019; Lima & Santos, 2016; Maieski et al., 2017; Perassinoto et al., 2013; Prates et al., 2016; Santos et al., 2018) or higher education (Alcará & Santos, 2013; Albuquerque et al., 2016; Beluce & Oliveira, 2016; Castro et al., 2016). Additionally, these studies adopt different instruments to assess these constructs, instruments often grounded on very distinct theoretical frameworks, which hinder comparisons.

For example, the study by Perassinoto et al. (2013), conducted with 314 students, both sexes, attending from the 3<sup>rd</sup> to the 9<sup>th</sup> grade in the countryside of São Paulo, in Brazil, and presented positive and statistically significant correlations between learning strategies and motivation. Motivation, however, was assessed according to the Self-determination Theory, which assesses an individual's intrinsic and extrinsic motivational aspects.

Due to a lack of studies simultaneously addressing learning strategies and motivation to learn and the differences between theoretical frameworks, this study's objective was to identify studies that addressed at least one of the variables in question. Therefore, the following studies are presented: Santos et al. (2018), which addresses motivation to learn and Scacchetti, Oliveira, and Moreira, (2015), and Inácio (2018), which address learning strategies.

With the objective to identify the existing relationship between reading comprehension, assessed by the Cloze test, and motivation to learn, assessed by the Escala de Motivação para Aprendizagem – EMAPRE (Learning Motivation Scale), Santos et al. (2018) assessed 169 students, both sexes and aged between 11 and 17 years old ( $M = 12.7$  years,  $SD = 1.2$ ), attending from 6<sup>th</sup> to 9<sup>th</sup> grades in schools located in the state of São Paulo, Brazil. The results indicate that the

mastery goal was the most frequent goal adopted, while a positive and significant correlation was found between mastery goal and the scores obtained in the Cloze test. A negative and significant correlation was found in regard to the performance-approach and performance-avoidance goals.

The analysis presented by Santos et al. (2018) also indicates the existence of a significant difference between sexes, which occurred only regarding the performance-approach goal ( $t = 2.389$ ;  $p = 0.018$ ), in which boys scored significantly higher than girls. Regarding years of schooling, a difference was found regarding the performance-approach goal ( $F = 4.095$ ;  $p = 0.008$ ), in which 6th-grade students stood out.

In order to verify the validity evidence of an instrument that resulted from adapting the Learning Strategies Assessment Scale for Primary Education – EAVAP-EF (Escala de Avaliação das Estratégias de Aprendizagem para o Ensino Fundamental), Scacchetti et al. (2015) addressed a sample of 709 students, both sexes, attending the vocational program of two schools located in the State of Paraná, Brazil. As expected, the exploratory factor analysis indicated a three-factor structure. The students scored higher in the absence of dysfunctional metacognitive strategies, while metacognitive strategies obtained the lowest scores. These results, however, should be considered with caution considering that the internal consistency of the instrument's subscales, assessed by Cronbach's alpha, was below what is considered acceptable ( $\alpha = 0.57$  in the metacognitive strategies).

Even with this instrument's caveat, Inácio (2018) used the EAVAP-EF with 12 items adapted from Schacchetti et al. (2015). The purpose was to analyze differences between intellectual styles, learning strategies, reading comprehension, and academic performance among 764 students, both sexes, attending from the 10<sup>th</sup> to the 12<sup>th</sup> grades of three schools located in the state of Paraná, Brazil: one public school and two private schools. The results show that students, from both public and private schools, more frequently use metacognitive strategies.

Considering the relevance of these constructs for a psychoeducational assessment in the attempt to find indicators that support the development of academic success among high school students (Bzuneck & Boruchovitch, 2016; Greene et al., 2004; Inácio, 2018), this study's objectives include: 1. characterize the students' level of motivation to perform school tasks and identify the extent in which students report the use of learning strategies; 2. correlate subscales of

motivation to learn and learning strategies; 3. analyze potential differences in the scores obtained in the scales according to sex and academic grades; and 4. verify whether the motivation to learn can predict the use of learning strategies.

## 2. Method

### 2.1 Participants

A convenience sample was composed of 261 high school students from a private school in the interior of the State of Bahia, Brazil. Of these, 52.1% ( $n = 136$ ) were girls, and 44.9% ( $n = 125$ ) were boys, aged 16 years and 6 months old on average ( $SD = 1.4$ ), minimum of 14 years old and maximum of 22 years old. Regarding school grades, 32.2% ( $n = 84$ ) were enrolled in the 10<sup>th</sup> grade, 27.6% ( $n = 72$ ) in the 11<sup>th</sup> grade, and 40.2% ( $n = 105$ ) were enrolled in the 12<sup>th</sup> grade.

### 2.2 Instruments

- *Learning Motivation Scale* – EMAPRE (*Escala de Motivação para Aprendizagem*) (Zenorini & Santos, 2010): composed of 28 items distributed into three factors, of which 12 are in the mastery goal subscale, nine in the performance-approach goal subscale, and seven in the performance-avoidance goal subscale. It is assessed on a three-point Likert scale in which 1 – disagree; 2 – do not know; and 3 – agree. For example, item 8. “I want to do better than the others in my class.” The internal consistency of the instrument’s items was performed using Cronbach’s alpha ( $\alpha$ ). The total scale presented an alpha equal to 0.73; the mastery goal presented an alpha equal to 0.80; performance-approach goal equal to 0.76; and performance-avoidance goal equal to 0.73.
- *Scale of Assessment of Learning Strategies for Primary Education* – EAVAP-EF (*Escala de Avaliação das Estratégias de Aprendizagem para o Ensino Fundamental*) (Oliveira, Boruchovitch, & Santos, 2010): the instrument has 31 items and was designed to identify cognitive and metacognitive strategies, as well as the absence of dysfunctional metacognitive strategies. Its items are assessed on a three-point Likert scale: 2 – always; 1 – sometimes; 0 – never. Scores are inverted for the questions in the subscale absence of dysfunctional metacognitive strategies. Evidence of content validity is provided along

with concurrent, criterion, and predictive validity. Regarding reliability, the Cronbach's alpha of the total scale was 0.79, while the subscale absence of learning strategies obtained an alpha equal to 0.80; cognitive strategies equal to 0.74; and metacognitive strategies equal to 0.62. This scale with psychometric properties verified for primary school students was chosen after semantically analyzing the items; the vocabulary of the items is not as different from that used among high school students. For instance, item 8. "I want to do better than the others in my class" and item 21. "I like it when a subject makes me feel like learning more." Additionally, according to EAVAP-EF's authors (Oliveira et al., 2010), the scale was designed to assess individuals aged from 7 to 16 years old, which partially matches the ages of high school students.

## 2.3 Procedures

The study is in accordance with Resolution 466/2012, from the National Council of Health, and was submitted to and approved by the Institutional Review Board of a public university (opinion report 1,748,266). Data were collected in the classroom according to the following order: EMAPRE and EAVAP-EF and took approximately 45 minutes. Only students who signed free and informed consent forms were included in the study.

## 2.4 Data analysis

Data were organized in an electronic spreadsheet and descriptive and inferential statistics were used to analyze data using the Statistical Package for the Social Sciences for Windows, version 22.0 – SPSS. Descriptive statistics were used to verify the means and standard deviations of the participants' data and scores obtained in the instruments. Pearson's  $r$  correlation, with magnitudes interpreted according to Cohen (1988), was used to identify correlations between the two instruments. The Student's  $t$ -test was applied to analyze potential differences in the scales' scores, considering the students' sexes. ANOVA was used to analyze differences in terms of academic grades so that Tukey's test for posthoc analysis was performed to separate subgroups according to academic performance with a level of significance established at 0.05. In this case, Cohen's  $d$  analysis was applied to determine the meaning of the statistical effect in the  $t$ -test. Finally, four



Stepwise regression models were estimated with the factors of the EAVAP-EF subscale as the dependent variables and the learning motivation factors as explanatory variables.

### 3. Results

The results are presented according to the description of this study's objectives. Regarding the investigation of learning strategies and motivation to learn, Table 3.1 presents means, standard deviations, and weighted means of the subscales' scores. Note that the weighted means refer to dividing the total score of each subscale by the number of items. This way, the most predominant result is obtained as they are compared similarly.

Table 3.1. Descriptive statistics of motivation to learn and learning strategies.

	Means	Standard deviation	Weighted mean
Mastery goal	28.85	4.70	2.40
Performance-approach goal	15.99	4.19	1.77
Performance-avoidance goal	10.20	3.36	1.45
Total motivation	55.03	6.85	1.77
Absence of dysfunctional strategies	13.77	3.95	1.05
Cognitive strategies	10.92	4.34	0.99
Metacognitive strategies	11.17	1.90	1.59
Total strategies	35.85	7.23	1.28

Table 3.1 shows that the students are more frequently oriented towards the mastery goal. Regarding learning strategies, they use metacognitive strategies more frequently while learning, followed by a lack of dysfunctional metacognitive strategies.

Pearson's correlation was used to analyze the relationships existing between learning motivation and learning strategies subscales. The results are presented in Table 3.2.

Table 3.2. Correlations between EMAPRE and EAVAP-EF.

	<b>Absence of dysfunctional strategies</b>	<b>Cognitive strategies</b>	<b>Metacognitive strategies</b>	<b>Total strategies</b>
Mastery goal	0.317**	0.492**	0.265**	0.538**
Performance-approach goal	-0.116*	0.139*	0.018	0.025
Performance-avoidance goal	-0.417**	-0.168**	-0.127*	-0.362**
Total motivation	-0.058	0.340**	0.130	0.207**

Level of significance \*  $p < 0.05$ ; \*\*  $p < 0.01$

As shown in Table 3.2, positive and significant correlations were found between the mastery goal and all the EAVAP-EF's factors, with small and moderate magnitudes of effect according to the classification proposed by Cohen (1988). Additionally, all the correlations between the performance-avoidance goal and the EAVAP-EF were negative and significant, with small and moderate magnitudes. The performance-approach goal was negatively and significantly correlated with an absence of dysfunctional strategies (small magnitude) and positively correlated with cognitive strategies (small magnitude). Finally, a positive and significant correlation was found between total motivation and strategies, with moderate magnitude and small magnitude between total motivation and total strategies.

Subsequently, differences due to the sex of the participants were verified, and the results are presented in Table 3.3.

Table 3.3. Differences according to sex.

Subscales	Sex	Mean	SD	<i>t</i>	<i>p</i>	<i>d</i>																																				
Mastery goal	Male	28.10	4.992	-2.481	0.014	-0.308																																				
	Female	29.54	4.334				Performance-approach goal	Male	16.90	4.515	3.419	0.001	0.424	Female	15.15	3.702	Cognitive strategies	Male	9.75	4.334	-4.289	0.001	-0.532	Female	11.99	4.077	Metacognitive strategies	Male	10.85	2.114	-2.643	0.009	-0.329	Female	11.46	1.633	Total strategies	Male	33.91	7.241	-4.4288	0.001
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According to the results presented in Table 3.3, the boys scored higher only in the performance-approach goal of the EMAPRE. The girls scored higher in the subscales learning goal, cognitive strategies, metacognitive strategies, and total strategies. Cohen's *d* analysis indicated a moderate statistical effect in all the subscales. Note that one of this study's aims was to seek differences in terms of academics grades; nonetheless, differences were random.

The last of this study's objective was to identify whether the motivation to learn can predict the use of learning strategies. For that, four regression analyzes were performed with the factors of the EAVAP-EF's subscale as dependent variables, while the predictor variable was the learning motivation's factors. Table 3.4 presents the results.

Table 3.4. Regression of motivation to learn factors.

<b>Dependent variables</b>		<b>Standardized coefficient</b>	<b>T</b>	<b>p</b>	<b>Adjusted R<sup>2</sup></b>
<b>Absence of dysfunctional metacognitive strategies</b>		<b>B</b>			
Model 3	Performance-avoidance	-0.35	-6.19	<0.01	0.22
	Mastery goal	0.23	4.13	<0.01	
	Performance-approach	-0.11	-2.09	<0.01	
<b>Cognitive strategies</b>		<b>Standardized coefficient</b>	<b>T</b>	<b>p</b>	<b>Adjusted R<sup>2</sup></b>
		<b>B</b>			
	Mastery goalr	0.49	9.08	<0.01	0.23
<b>Metacognitive strategies</b>		<b>Standardized coefficient</b>	<b>T</b>	<b>p</b>	<b>Adjusted R<sup>2</sup></b>
		<b>B</b>			
Model 1	Mastery goalr	0.26	4.42	<0.01	0.06
<b>Total strategies</b>		<b>Standardized coefficient</b>	<b>T</b>	<b>p</b>	<b>Adjusted R<sup>2</sup></b>
		<b>B</b>			
Model 2	Mastery goalrr	0.47	9.12	<0.01	0.33
	Performance-avoidance	-0.23	-4.58	<0.01	

The dependent variable in the first analysis was the absence of dysfunctional metacognitive strategies and resulted in three statistically significant models, the third of which was the one that best explained variance (Adjusted R<sup>2</sup>= 0.22). Hence, the performance-avoidance goal, mastery goal, and performance-approach goal can predict the absence of dysfunctional metacognitive strategies.

The subscale of cognitive strategies was the dependent variable used in the second regression, and only one explanatory model statistically significant emerged (Adjusted R<sup>2</sup> = 0.23), showing that mastery goals can predict cognitive strategies. Subsequently, metacognitive strategies were the dependent variable of the third

regression, and one explanatory model statistically significant (Adjusted  $R^2$  = 0.06) is presented. Thus, mastery goals can predict metacognitive strategies.

Finally, the dependent variable in the fourth analysis was the total scale of learning strategies and indicated two statistically significant models, though the second model explained variance better (Adjusted  $R^2$  = 0.33). Hence, mastery goals and performance-avoidance goals can predict learning strategies.

#### 4. Discussion

The instruments' descriptive analyzes indicate that students are more frequently mastery-goal oriented, meaning they are more creative and interested in absorbing content and using appropriate learning strategies (Bzuneck & Boruchovitch, 2016; Senko & Hulleman, 2013). Based on the previous discussion, one can assume that, throughout the school stages, students tend to be more oriented towards the actual meaning of knowledge than by the avoidance of unpleasant situations involved in learning, such as appearing incompetent to colleagues.

This is a benefit in the educational context, considering that understanding the real meaning of learning goals contributes considerably to the acquisition of knowledge (Alcará & Santos, 2013; Bzuneck & Boruchovitch, 2016). Additionally, these results indicate that even in the face of difficulties historically rooted in the Brazilian high school education in terms of pedagogical-curricular organization and lack of investment to provide continuous education to teachers, among others (Ferreira & Silva, 2017; Krawczyk, 2011), students have been able to deal with adversity and effectively focus on the importance of learning academic tasks.

The result concerning the prevalence of metacognitive strategies adopted at the time of learning is very relevant in the educational context because it indicates that students are aware of the need to reflect upon their own thinking, planning, regulating and controlling their behavior to support learning, a highly complex task (Dembo, 1994; Oliveira et al., 2017). The use of these strategies is conceived in the literature as essential to achieve satisfactory academic performance (Lima & Santos, 2016; Prates et al., 2016).

This result is in agreement with the study by Inácio (2018), in which both public and private high schools are addressed. Scacchetti et al. (2015), however, found different results when addressing students attending a vocational program, in which the lowest scores were obtained in metacognitive strategies. These

divergences reveal the need to conduct more in-depth research so that it is important to consider the fact that these studies addressed samples attending different programs, that is, a traditional high school program and a vocational high school program.

These results are even more relevant if we consider that high school is a stage preceding higher education and/or the job market. That is, the results show that high school students adopt the necessary tools to satisfactorily acquire knowledge, understanding the importance of such knowledge not only for an academic career but for the comprehensive training of individuals in society, a society in which they will practice their future professions (Alcará & Santos, 2013; Inácio, 2018).

Likewise, educational differences existing in the various Brazilian regions, as well as social inequalities, are issues that need to be discussed. That is, the universalization of education and the fact that attending high school is mandatory, as the final stage of primary education, do not ensure academic success or that the same opportunities are available to all students (Ferreira & Silva, 2017; Inácio, 2018). Psychoeducational analyses enable to theoretically discuss the importance of motivation to learn and the use of learning strategies to acquire knowledge. These analyzes also enable reflecting upon deficits presented by the Brazilian educational process in order to overcome them. Additionally, analyzes aid the identification of practices that can be implemented, such as what is the best way to teach the use of strategies to students in addition to the importance of teachers updating their knowledge continually.

Regarding the second objective, which was to correlate the motivation and learning strategies subscales, the results present a correlation between the mastery goal and all the learning strategies subscales. No studies using the same instruments were found; however, the results reported by Castro et al. (2016) were very similar because intrinsic motivation, the subscale that is the closest to the mastery goal subscale and part of the Self-determination Theory, was correlated to all the strategies subscales, which similarly to this study, were assessed using EAVAP-EF.

Correlations between these constructs were expected, considering that motivation contributes to using more appropriate learning strategies at the time of studying, as reported by other authors (Alcará & Santos, 2013; Greene et al., 2004; Zenorini & Santos, 2010). Note how much, according to Greene et al. (2004),

motivation influences cognitive development and, consequently, more satisfactory academic outcomes. Therefore, efforts towards the performance of tasks, being persistent in the face of difficulties, as well as toward achieving previously established goals, depend, among other aspects, on the students' level of motivation.

Additionally, there were negative and significant correlations between the performance-avoidance goal and learning strategies subscales. No studies were found to corroborate these results. These results, however, make sense to the extent that the goal in question is related to a concern on the part of students with not looking incompetent to peers, which does not reflect responsibility in learning per se, that is, strategies intended to acquire knowledge are less often used (Bzuneck & Boruchovitch, 2016).

Regarding the third objective, an analysis was performed to verify potential differences in the scores obtained in the scales according to sex and academic grades. Significant differences were found regarding sex in the subscales mastery goal and performance-approach goal, while boys scored higher only in the last subscale. A significant difference was also found for the cognitive and metacognitive strategies and overall strategies; girls scored higher in all these subscales.

These findings are in line with those reported by Santos et al. (2018), which means statistically significant differences were reported regarding boys scoring higher than girls in the performance-approach goal subscale. This goal refers to individuals with a need to stand out among peers as being the most intelligent, without effectively focusing on learning (Bzuneck & Boruchovitch, 2016; Zenorini & Santos, 2010).

These differences were analyzed in an attempt to identify indicators that explain controversies in the literature regarding assessments according to sex, which are quite heterogeneous. These differences may accrue from cultural, social, or school factors, or may be even random, showing the importance of further investigating this variable (Dal'Igna, 2007). A potential explanation may be a cultural factor that impels women to achieve greater success in various spheres, including academic performance.

Note that no differences were found in terms of academic grades. Some studies, however, conducted with primary school students show that students are more motivated to learn at the beginning of the educational process (Ferraz et al., 2019; Santos et al., 2018). Similar expectations exist regarding learning strategies

(Oliveira, Boruchovitch, & Santos, 2011). For this reason, the hypothesis that there would be differences among high school students as well was not confirmed.

Such a result may have resulted from the specificity of the sample adopted in this study; students enrolled in a single private school located in the interior of the state of Bahia, Brazil. Previous studies (Ferraz et al., 2019; Oliveira et al., 2011; Santos et al., 2018) reporting diminished motivation to learn or use learning strategies throughout educational stages suggest such a decrease may be related to various factors. Oliveira et al. (2017) report that many deficits presented by high school students due to gaps in the previous stages during primary education, showing a need for teachers to promote more effective learning-teaching processes over the entire school process.

Finally, the last objective was to identify whether the motivation to learn would predict the use of learning strategies. The hypothesis was that this relationship would occur, considering the correlations existing between the mastery goal and the strategies subscales, in addition to the evidence presented in the literature (Perassinoto et al., 2013; Zenorini & Santos, 2010). When students are mastery-goal oriented, they become involved with the learning process, seek new knowledge, and strive for academic tasks, obtaining greater self-control and autonomy. As a consequence, they use appropriate learning strategies more frequently (Alcará & Santos, 2013).

Four regression analyzes were performed with the factors of the EAVAP-EF's subscales, the dependent variable, while the predictor variables were the factors of motivation to learn. Hence, the performance-approach goal, learning goal, and performance-avoidance goal scales predict the absence of dysfunctional metacognitive strategies. This result suggests that students oriented by performance goals, that is, who need to stand out among peers and/or to safeguard from being depreciated, as well as behaviors such as focusing on the learning process and being effectively interested in content (Bzuneck & Boruchovitch, 2016; Zenorini & Santos, 2010), may predict the absence of strategies that harm the acquisition of knowledge.

The mastery goal scale predicted cognitive strategies, that is, behavior focused on effective learning (Senko & Hulleman, 2013) can predict the organization, development, and integration of information (Dembo, 1994, Suehiro et al., 2018). The mastery goal scale also predicted metacognitive strategies, indicating that focusing on the learning process, on mastering content, and performing tasks



(Senko & Hulleman, 2013) explain aspects, such as thorough planning, monitoring, regulating one's thinking, and keeping an internal state that is conducive to learning, which corresponds to metacognitive strategies (Dembo, 1994; Scacchetti et al., 2015).

Finally, the mastery goal and performance-avoidance goal scales were considered to be predictors of learning strategies. Thus, a concern with learning and avoiding depreciation from peers, teachers, among others (Bzuneck & Boruchovitch, 2016; Zenorini & Santos, 2010) may explain the use of learning strategies, as these contribute not only to learning but also support improved academic performance (Prates et al., 2016; Zenorini & Santos, 2010). Note that no studies were found in the literature addressing whether motivation predicts learning strategies, which hinders the comparison of results and reinforces the importance of this study.

## 5. Final considerations

This study achieved the objectives proposed, and the results showed that high school students tend to score higher in the items concerning mastery goals and metacognitive strategies. These results are positive to the extent they contribute to students' academic success. Additionally, these findings partially agree with other Brazilian studies, considering that few studies address the subject in question.

The relevance of this study is that it supports a greater understanding of learning processes among high school students by analyzing the various factors connected to the issue of learning to learn. There are, however, limitations that should be noted in order to guide the continuity of research. The sample used here is very particular, as it originated from a single private school located in a town in the northeast of Brazil (Salvador, BA). Another limitation refers to the scale used, the psychometric properties of which were verified among primary school students. Even though the items were semantically analyzed prior to its application, no experts participated in the process, nor a pilot test was performed with high school students before implementing the study.

Thus, further research is needed to investigate the motivation and learning strategies constructs more deeply. We also note the importance of other psychoeducational variables such as academic self-efficacy and self-regulated learning, to be analyzed together. Finally, future studies are suggested to develop

or adapt an instrument to measure learning strategies directed to high school education in Brazil.

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